MIT
Design Guidelines

Residences

T15 Thematic Folder

Issued 2022

Department of Facilities

Table of Contents

1. RESIDENCES DESIGN STANDARDS

1.1 Purpose

The MIT Design Standards describe specific planning and architectural requirements germane to the design of new facilities and renovations to MIT's graduate and undergraduate residences. They are general in their applicability and provide insight into MIT's residential life system. These standards are not intended to take the place of a detailed architectural program for comprehensive programmatic renewal or construction new residences.

MIT Residential Life & Dining is comprised of the following:

1. Housing: Undergraduate, family graduate, non-family graduate.
2. Dining.
3. Office of Fraternities, Sororities, and Independent Living Groups (FSILG).
4. First Year Experience (FYE).
5. Residential Life Programs (RLP).

1.2 Undergraduate Bedroom Area Requirements

In the undergraduate system, MIT (up to 2017) typically provides a double loaded corridor design.

Massachusetts State standards for single bedrooms require a minimum of 80 square feet per person and 60 square feet per person for each person in a shared bedroom to align with State Sanitary Code.

The Massachusetts State requirements may not be an appropriate standard for evaluating MIT's housing capacities.

The MIT Housing space allocation (SQF) per person in singles doubles triples and quads will exceed the MA Sanitary Code requirement of 60 square feet per person

MIT Housing Architectural Principals establish a minimum size for a single bedroom of 90 sf and for a double bedroom of 180 sf. Below are area ranges to be used in establishing bedcount of particular bedrooms. The ranges below are the minimum size for each room type:

1. Single: 90 to 179 square feet.
2. Double: 180 to 269 square feet.
3. Triple: 270 to 359 square feet.

4. Quadruple: 360 square feet.

In addition to the above area ranges, there are other, more subjective "Soft Factors" that exist outside the scope of the preliminary bedroom space and fixture evaluation, which may further limit the assignment capacity of each undergraduate residence. Examples of Soft Factors might include:

1. Considerations for Shared Common Space:

    a. Does a residence have sufficient shared common space to support an increased number of residents?
    b. In the undergraduate facility an average of 40 - 50 square feet of shared space per student should be available to support community development.

2. Students per Head of House: Any student capacity above 375 requires the addition of a Head of House apartment.
3. Students per Graduate Resident Tutor (GRT): This ratio should never exceed 35 students per GRT with a comfortable range of 30-35 to ensure safe oversight of MIT students.
4. Dining Capacities: All residence halls should provide a dining hall.

1.3 Graduate Space Requirements

In the graduate system, MIT typically provides apartment style design. Graduate apartments include:

1. Efficiency Apartments:

    a. 250 to 300 square feet.
    b. Small kitchen with under-counter refrigerator and 20 inch stove with oven.

2. Two and Three Bedroom Apartments:

    a. Single bedrooms for all students.
    b. Shared living room, kitchen and bath.
    c. Full kitchen with 30 inch stoves, ducted ventilation for kitchen hoods, and 18 cubic foot refrigerator.
    d. Dishwashers in family housing only.

3. Considerations for Shared Common Space:

    a. Does a residence have sufficient shared common space to support an increased number of residents?
    b. In the graduate facility an average of 35 square feet of shared space per student

should be available to support community development.

4. Students per Head of House: Any student capacity above 375 requires an Associates head of House apartment.

5. Laundry Facilities: See below.

1.4 Event Space Requirements

Undergraduate and Graduate event space include:

1. Music Practice.
2. Game Room.
3. Floor lounges.
4. Multiple meeting / study rooms.
5. Exercise Room.
6. Interior Bicycle Storage (capacity dictated by zoning ordinance).
7. Large Event Lounge.

1.5 Staff Living Space Requirements

Head of House Apartment:

1. 2,000 square feet minimum.
2. 3 bedrooms.
3. Office.
4. 2.5 bathrooms.
5. Living room.
6. Dining room.
7. Kitchen.
8. Laundry room.

Associate Head of House Apartment:

1. 1,200 square feet minimum.
2. 2 bedrooms.
3. Office.
4. 1.5 to 2 bathrooms.
5. Living room.
6. Dining room.
7. Kitchen.
8. Laundry room.

Area Directors (AD) and Visiting Scholars:

1. 700 square feet minimum.
2. 2 bedrooms.
3. 1 bathroom.
4. Living / Dining room.
5. Kitchen.

Graduate Resident Tutor (GRT):

1. 450 square feet minimum.
2. 1 bedroom.
3. 1 bathroom.
4. Living / Dining room.
5. Kitchen.

1.6 Back-of-House Space and Fit-out Requirements

Lobby Service Desks:

1. Security check-in.
2. Package desk and supply storage room.
3. Rear of mailboxes are typically in this space.

Staff Break Room:

1. Cooking facilities, a minimum of a microwave, sink and refrigerator
2. Room for small dining table and chairs.
3. Bathroom with shower.
4. Lockers.

Maintenance Mechanic Shop:

1. Office with computer.
2. Workshop.
3. Supply and tools storage.

Storage Rooms:

1. Furniture.
2. Cleaning supplies.
3. Note: Mechanical rooms may not be used for storage.

Managers Office:

1. Space for meeting students.
2. Near lobby, with glass to be visible to residents.

Area Directors Office:

1. Undergraduate Housing only.
2. Space for meeting students.
3. Near lobby, with glass to be visible to residents.

1.7 Residence Bathrooms

Refer to MIT Design Guidelines - Division 23 - Plumbing for fixture requirements:

1. Undergraduate bathrooms are utilized by all genders.
2. Urinals are never used in student bathrooms.
3. All non-family housing units should provide showers.
4. Family housing requires bathtubs.
5. Undergraduate shower stalls should be lockable for privacy.
6. Tile with copper pan for all showers.
7. Tile half wall behind sinks and toilets.
8. Tile floors.
9. All undergraduate halls should include one single stall bathroom per floor for privacy.
10. Provide wall-hung toilets in undergraduate housing and floor-mounted toilets for apartment style housing.

1.8 Residence Kitchens

Refer to MIT Design Guidelines - Division 23 - Plumbing for plumbing fixture requirements.

Solid wood cabinetry and solid surface counters typical.

1.9 Residence HVAC

Comply with MIT Systems Engineering Group design standards and Division 23 as required.

Thermostats:

1. Individually controlled in each room including apartments.
2. In family apartments, a single thermostat is adequate.

Air Conditioning: 4 pipe.

Shutoffs:

1. Individual units.
2. Risers.

1.10 Residence Information Systems and Technology (IS&T)

The Division of Student Life principles for network services in residential buildings include the following:

1. Vision:

    a. Network service is an essential residential utility (e.g. power, water, and heating) that should be integrated into each building's capital renewal plan.
    b. The proportional costs incurred by IS&T to provide this utility and sustain services as part of the overall campus network infrastructure shall be included in each buildings capital renewal plan.
    c. Due to evolving technology, this statement of principles will be reviewed annually by a cross functioning team from IS&T, Residential Life comprised of MIT Housing and the Office of Fraternities, Sororities, and Independent Living Groups (FSILGs), and building resident representatives.
    d. The review group, convened by IS&T, will also approve proposed changes to this statement of principles.

2. Minimum Service Levels:

    a. Residents should be able to connect their personal devices to the MIT network, including laptops, smart phones, and tablets to the extent these devices are compatible with an enterprise class network.
    b. Each residence building should have ubiquitous wireless coverage, both cellular and Wi-Fi. Cellular coverage applies to campus buildings only.
    c. Each resident should have at least 1 wired port per pillow in their residence. Family housing units will have at least 2 wired ports per residence.
    d. Network service will be provided subject to MIT's campus network security policies, with the expectation users will adhere to MITnet rules of use.

3. Minimum Delivery Standards:

    a. 1 gigabit service to each building.
    b. 1 gigabit service to each wired port within each building.
    c. Wireless 802.11xx B, N, AC, AX.
    d. Residence network service comparable to that of academic buildings.

4. Infrastructure:

    a. Telecom rooms will provide 24/7 cooling. UPS/Generator power and card accessible doors with sufficient square footage for supporting networking needs for equipment and cabling pathways. Refer to Division 27 for more information.
    b. In the FSILGs, telecom rooms will adhere to the requirements of the FSILG Network Maintenance Program of the MIT Association of Independent Living Groups (AILG).

Coordinate with Division 27 - COMMUNICATIONS as required.

1.11 Residence Audio Visual

MIT Housing provides either a projector, screen and sound system, or monitor for television and meeting functions in 1 or 2 meeting spaces in graduate and undergraduate residence halls.

Style and requirements are to be determined in collaboration between MIT Housing and MIT Audio Visual.

1.12 Residence Soundproofing

Provide soundproofing in the following areas:

1. Music practice rooms.
2. Exercise rooms.
3. Retail spaces.
4. Between student rooms.

1.13 Residence Flooring

Student Rooms:

1. Undergraduate: VCT or similar type flooring to accommodate allergy concerns.
2. Graduate: Carpet, glued to accommodate furniture movement.

Corridors: Carpet tile preferred.

Event Spaces: Use will determine flooring type, for example:

1. Exercise Rooms: Rubber.
2. Laundry Rooms: Ceramic tile or epoxy.
3. Meeting Rooms: Carpet.
4. Other: VCT, carpet or wood depending on use expectations.

1.14 Residence Furniture

Housing furnishes all non-family graduate housing and undergraduate bedrooms. Family Housing apartments are typically unfurnished. Public event spaces are fully furnished in all Housing buildings.

1. Bedrooms: Housing has standard furniture for use in all student rooms, comply with MIT Housing standards.
2. Public and Event Spaces: Open for designer's review or Housing standard on a project-by-project basis.
3. Security Desks: See below.
4. Cabinets and Countertops: See below.

1.15 Residence Mailboxes

Manufacturer: Bommer Industries, Inc. mailboxes and hardware.

1. Housing typically orders through Pasek Corporation in South Boston.
2. Mailboxes shall include a lockset cylinder on the door that accepts the Arrow 7 pin interchangeable Arrow core, keyed so that the mailbox locks work with the student room key.
3. The decision for front loading or rear loading as well as the box door size depends on function of desk area. In the past Door size "A" 5-3/16 high by 6-3/8 inch wide has been suitable.
4. Refer to Appendix B - MAILBOXES for additional information.

1.16 Residence Laundry

Laundry Machine Vendor: MacGray.

1. Vendor provides all laundry machines and folding tables. Internet jack is needed for each machine.
2. Undergraduate and Non-Family Graduate Housing: Recommended ratio is 25 students per washer / dryer pair.
3. Family Housing: Check with laundry vendor.

1.17 Residence Vending Machines

Space for minimum 2 vending machines.

One internet port per vending machine.

Typical location is near public spaces, for example Laundry Rooms.

1.18 Integrated Pest Management

How a waste management system is established at the exterior of a residence, as well as within a residence is an aspect of design that requires careful attention. Please consult with the pest management vendor and MIT Recycling & Materials Management on setting up systems for kitchen liquid/solid waste, composting, oil recycling, and general materials recycling.

Doorways grant access to people but also pests: the gap between a door and a door jamb should be 1/4 of an inch or less.

Depending on the design of the cooling and heating system, these spaces can at times serve as dark, quiet, and sheltered walkways for pests.

Prior to starting work in any residence a pest inspection of the space should be conducted, by the pest management vendor and design team, to control or eliminate any pest and to seal any pest access points in to the space.

After the work is concluded a follow up a pest inspection of the space should be conducted, by the pest management vendor and design team to ensure all pest access points have been blocked in a lasting way with suitable materials.

Focus for both inspections should be the perimeter of the room, kitchens, waste facilities (internal, external, and the interface for both), closets, electrical systems, dropped ceilings, sewer pipes and sewer systems, heating and cooling systems.

2. RESIDENCE SECURITY DESIGN STANDARDS

2.1 Residence Security Systems - General

Purpose: To provide guidance on security system design standards for new construction.

1. Coordinate with Thematic Folder T20 - Campus Safety and Security Services and the MIT IS&T Campus Safety and Security Infrastructure Team for MIT Standard Models and Manufacturers.
2. Provide emergency power to maintain security in the event of a power outage, standby power or emergency power as applicable.

2.2 Residence Video Surveillance

All surveillance cameras must be approved by the MIT Campus Safety Working Group. Install security cameras in the following locations:

1. Interior and exterior of all Resident Hall entry and exit doors, including roof doors, maker

spaces, security gates and roll-up doors.
2. Mechanical rooms and Tel/Data rooms.
3. Do not install security cameras in resident hall living or common areas with the exception of approved locations.

2.3 Residence Access Control

Install card reader equipped doors in the following locations and where access control is required:

1. Main and remote entry doors.
2. Doors that access Resident Hall living or common areas including doors that provide access from the main lobby or dining areas.
3. Handicap-accessible doors equipped with push-button opening devices, and should operate the automatic door mechanism when a valid resident card is presented.
4. Parking garages, elevator bank enclosures, and designated resident rooms.
5. Security gates and roll-up doors.
6. Tel/Data rooms and doors providing access into maintenance or electrical spaces. Access is authorized only through MIT IS&T, or Department of Facilities offices.
7. Gym and workout rooms.
8. Music rooms.
9. Maker spaces.
10. Media rooms.
11. All entry and exit doors should be wired for installation of a card reader in the future, even if doors are identified as emergency or egress-only doors.

Verification card readers should be installed at security desks at a location that allows residents with disabilities to be able to easily access card readers.

2.4 Residence Alarm Sensors

Install alarm sensors in the following locations:

1. Entry and exit doors.
2. Restricted access doors in residence halls including roof hatches and child care facilities within residence halls.
3. At a minimum, alarm sensors shall include magnetic contact sensors to identify if doors are open or closed, and alarm sounders which can be turned off or delayed when requested.
4. Request-to-Exit (REX) sensors shall be installed on all authorized exit doors, except doors identified as emergency or egress only doors and roof-hatches.
5. Head of House apartments that have entrances off the street shall have a limited burglar alarm system installed to secure their residence.

2.5 Residence Video Intercom Systems

Install video door stations and video phones in the following locations:

1. Main and remote entry doors to allow for identification and approval of individuals requesting access to Residence Halls.
2. Security gates and roll-up doors to facilitate deliveries.
3. Audio video master station at security desk.

2.6 Residence Panic Buttons

Install panic buttons in the following locations: Please note all Panic Buttons must be approved by MIT Campus Safety Working Group prior:

1. Security desks, and monitored by MIT Police Department.
2. Activation of a panic button at a security desk shall transmit an alarm signal to the MIT Police and shall also activate a camera view at the MIT Police dispatch office that shows the area in front of the security desk.

Refer to Thematic Folder T20 - Campus Safety and Security Services for MIT standard models and manufacturers.

2.7 Residence Security Door Hardware

Door Release Buttons: Install in the following locations:

1. Security Desks: One door release button shall provide momentary unlock on the main entry doors. A separate door release button shall provide momentary unlock on the main entry doors and shall activate the automate door opener. [Remote entry doors equipped with a video intercom door station shall already have on-board momentary release buttons on the audio visual master station located at the security desk.].
2. Only install on doors with a Video Intercom door station.

Automatic Door Openers: Install in the following locations:

1. Entry doors for one of each type of room in each Residency Hall (undergraduate singles, doubles, triples, quad, and suites, and graduate apartments) to provide enhanced accessibility to residence. All automatic door openers installed on doors that are also equipped with access control shall be interfaced with the access control system to provide the following functionality: The in-bound paddle shall be disabled when the door is in a locked state. On valid admit where a card holder is flagged as ADA the access control system shall automatically activate the automatic door opener. In all vestibules equipped with access control an auto door openers having interior and exterior door sets, the

exterior set shall be latching passage doors with automatic door openers allowing free ingress. The interior set shall be equipped with automatic door openers interfaced with access control to provide the functionality outlined above.

2. On Lobby entrances or locations with both interior and exterior doors, residents should be allowed to enter through the exterior door using the handicap access button without tapping a card, but must tap a VALID ID card to activate the card access sensor on interior doors.

Key Control:

1. Key Type: Arrow restricted 3C keyway. 7 pin interchangeable core / key. Refer to Appendix A: LOCKS for additional information.
2. Residences:

    a. Housing uses their own key system in entry and student use spaces.
    b. MIT Housing will provide cores for housing locks.

3. Dining:

    a. Uses the Best Interchangeable Core System.
    b. Applies to all dining doors on campus.
    c. MIT Dining will provide cores for dining spaces.

4. Mechanical, Electrical, and IS&T Related Spaces:

    a. Preferred Manufacturer: Schlage.
    b. Coordinate with additional MIT Access Control, IS&T, and Mechanical Room requirements.

2.8 Residence Lobby Security Desks

Desk Design:

1. Desk heights shall allow for an unobstructed view of entry points, lobby areas, and guests, even while sitting.
2. Design shall include lockable key storage drawers to facilitate lock-out key procedures.
3. Desk space shall allow for the installation of video monitors (see below), a desktop computer or laptop with docking station, keyboard, mouse, analog or VOIP phones, and the Audio Visual Intercom Master Station.
4. Space under the security desk can be used for installation of the desktop computer, and proper ventilation and adequate leg room need to be incorporated into the design.

Video Monitors:

1. Allow for the installation of two 27 inch diagonal video monitors that cannot be viewed by guests at the desk or personnel in the lobby area.
2. Monitor area should be easily viewed from sitting or standing position.

Power and Connectivity:

1. Three double port power outlets for 120W power connectivity of equipment and computers.
2. Three Ethernet outlets for use of computer and VOIP phones.
3. One analog phone line for installation of security phone line.

Alarm System:

1. Ability to install panic button and remote door release buttons under the desktop.
2. Desk space for installation of Audio Visual Intercom Master Station.

Point of Contact: Security Operations Manager at (617) 324-6407.

3. RESIDENCE KITCHEN CASEWORK DESIGN STANDARDS

3.1 Performance Requirements

Loading: Housing cabinets, countertops and related casework shall withstand the effects of the following uniformly applied gravity loads and stresses without permanent deformation, excessive deflection, or binding of drawers or doors:

1. Base Cabinets: 500 pounds per foot.
2. Work Surfaces: 160 pounds per foot.
3. Shelving: 40 pounds per foot.

Quality Standards: Interior architectural woodwork shall comply with Architectural Woodwork Standards (AWS) by the Architectural Woodwork Institute (AWI), Architectural Woodwork Manufacturers Association of Canada (AWMAC), and Woodwork Institute (WI). AWS standards apply to project specifications, construction, finishing, installation, and as indicated.

1. Grade: As specified.

3.2 Construction

Dimensions: In accordance with AWS and as shown on the drawings.

Wood Cabinets:

1. AWS Grade: Premium.
2. AWS Construction Type: Type A construction, Style 12 overlay, flush.
3. Cabinet Bodies and Shelves: Hardwood veneer plywood with veneer core.
4. Cabinet Doors: Hardwood veneer plywood with particleboard core.
5. Exposed Surfaces:

    a. AWS Grade: Premium.
    b. Wood Species and Cut for Exposed Surfaces: Hard Maple, Select White (sapwood), clear, AA grade, plain sliced and sawn.
    c. Grain Direction: Vertical at veneer panels. Horizontal at solid wood drawer faces.
    d. Matching of Veneer Leaves: Slip match.
    e. Veneer Matching within Panel Faces: Balance Match.

6. Semi-Exposed Surfaces:

    a. AWS Grade: Premium.
    b. Surfaces other than Drawer Bodies: Plain sliced solid maple, shop finished.
    c. Drawer Sides and Backs: 5/8 inch solid clear maple lumber with dovetail joints, shop finished.
    d. Drawer Bottoms: Hardwood plywood, fully captured, shop finished.
    e. Edge Banding: Solid wood of same species as face veneer, minimum 1/8 inch thick.

Laminate Clad Cabinets:

1. AWS Grade: Custom with backer sheet to balance.
2. Edge Banding: Solid wood of same species as face veneer, minimum 1/8 inch thick.

Laminate Clad Countertops:

1. AWS Grade: Custom with backer sheet to balance.
2. Material and Finish: Match interior standing and running trim with transparent finish.
3. Backsplash: Solid wood in profile indicated on the drawings.
4. Edge Banding: Solid wood in profile indicated on the drawings.

Interior Standing and Running Trim with Transparent Finish:

1. AWS Grade: Premium.
2. Material: Solid hardwood.
3. Wood Species and Cut for Exposed Surfaces: Hard Maple, Select White (sapwood),

clear, AA grade, plain sliced and sawn.

Interior Standing and Running Trim with Opaque Finish:

1. AWS Grade: Premium.
2. Material: Solid hardwood.
3. Wood Species and Cut for Exposed Surfaces: Clear, non-finger jointed poplar.

Wood Rails at Door Side-lites with Transparent Finish:

1. AWS Grade: Premium.
2. Material: Solid hardwood.
3. Wood Species and Cut for Exposed Surfaces: Yellow birch, clear, AA grade, plain sliced and sawn.

Shop Finishing:

1. AWS Grade Samples: Provide finishes in same grade as items to be installed.
2. Preparation for Finishing: Comply with referenced quality standard for sanding, filling, countersunk fasteners, sealing concealed surfaces, and similar preparation and construction.
3. Back prime with one coat of sealer to concealed surfaces.
4. Transparent Finish System:

    a. AWS Finish System: 5, Conversion Varnish.
    b. Sheen: Satin, 30-50 gloss units.
    c. Opaque Finish: Field finished in accordance with Division 09, painting.

3.3 Products

Medium Density Fiberboard (MDF):

1. Manufacturer: Medex, moisture resistant panels, by Sierra Pine or approved equal.

Medium Density Particleboard:

1. Manufacturer: Sky Blend Particleboard, by Roseburg or approved equal.

Solid Surfacing:

1. Material: Solid polymer sheet.
2. Manufacturer: Corian Surfaces by DuPont, no substitutions.
3. Thickness: minimum 1/2 inch.

4. Application: Typical material for countertops.

High Pressure Decorative Laminate: To ANSI/NEMA LD23 and as follows:

1. Laminated Countertops and Wall Mounted Shelving: General Purpose, Grade HGS, 0.0482 inch nominal thickness.
2. Cabinets and Casework: Vertical Surface, Grade VGS, 0.0282 inch nominal thickness.
3. Melamine is not permitted for cabinet interiors, shelving, or other exposed or semi-exposed surfaces.

Drawer Slides:

1. Typical: Accuride 3832EC, 100 pound rated, soft closing, full extension, bright electroplate zinc finish.
2. Pullout Accessible Counters: Accuride 7434, 100 pound rated, 1.0 inch over travels, bright electroplate zinc finish.
3. Trash Pullouts: Accuride 4034, 150 pound rated, 1.5 inch over travel, bright electroplate zinc finish.
4. Adjustable Shelf Supports: Clear plastic support with steel pin, Richelieu #34004011 or approved equal to meet loading requirements above.

APPENDIX A: LOCKS

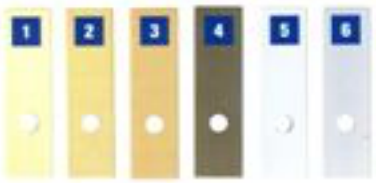
Refer to http://www.lockingsystems.com/DownLoad%20PDFs/Arrow-Q-Series-Lever-Lock.pdf

ARROW Q SERIES CYLINDRICAL LOCK LEVER

Q SERIES DESIGNS:

Sierra – SR | Broadway – BRR | Ventura – VR

FINISHES:



	BMHA	U.S. Equivalent	
1	605	US3	Bright Brass
2	606	US4	Satin Brass
3	612	US10	Satin Bronze
4	613	US10B	Dark Oxide Bronze, Oil Rubbed
5	625	US26	Bright Chromium Plated
6	626	US26D	Satin Chromium Plated

CYLINDERS:

Conventional–Q Series locksets are supplied standard with Arrow "A" keyway, 6 pin cylinder. As with all other lock series, various levels of masterkeying are available. Conventional cylinders are available in a variety of competitive manufacturers keyways. Supplied with two nickel silver keys.

Cylinder Options–Interchangeable core/flex-core – lockset prepared for use with 6 or 7 pin interchangeable core. Supplied less core, but packed with 6 and 7 pin tailpieces. Will accept cores manufactured by Best™, Falcon™, Medeco Keymark™ and others. Suffix "IC" to design. Temporary Arrow construction cores are also available.

High Security–For cylinders meeting UL437 for pick and drill resistance. Consult cylinder catalog section for options.

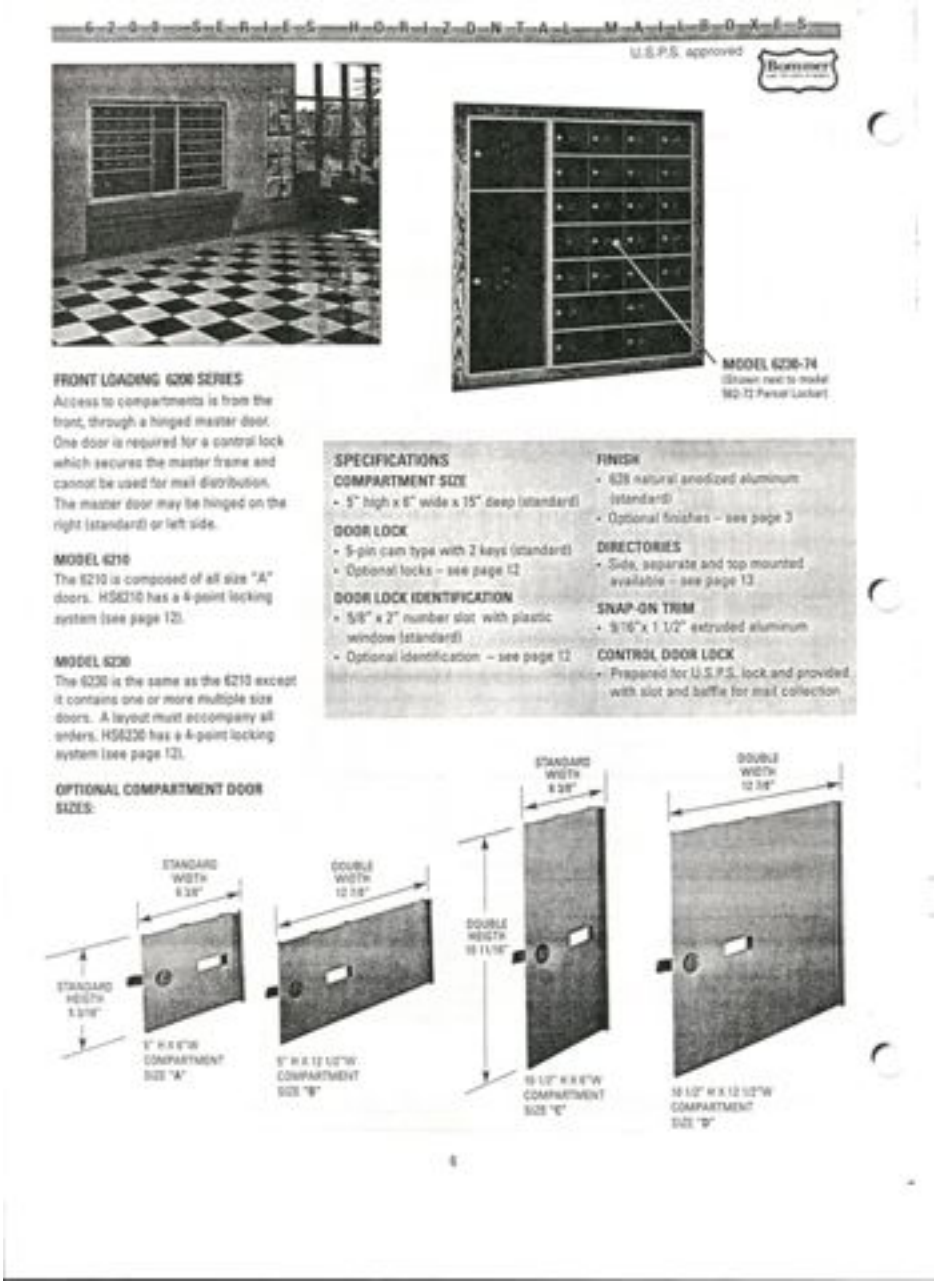
INTERCHANGEABLE CORE:

Look for this symbol to indicate availability of product with interchangeable core.

3

APPENDIX B: MAILBOXES

Refer to https://www.bommer.com/ps/catalogs/BommerPSCatalog.pdf



6200 SERIES RECESSED MAILBOXES

U.S.P.S. approved

Bommer

MODEL 6230-74
(Drawer next to model 562-72 Parcel Locker)

FRONT LOADING 6200 SERIES
Access to compartments is from the front, through a hinged master door. One door is required for a control lock which secures the master frame and cannot be used for mail distribution. The master door may be hinged on the right (standard) or left side.

MODEL 6210
The 6210 is composed of all size "A" doors. HS6210 has a 4-point locking system (see page 12).

MODEL 6230
The 6230 is the same as the 6210 except it contains one or more multiple size doors. A layout must accompany all orders. HS6230 has a 4-point locking system (see page 12).

OPTIONAL COMPARTMENT DOOR SIZES:

SPECIFICATIONS

COMPARTMENT SIZE
- 5" high x 6" wide x 15" deep (standard)

DOOR LOCK
- 5-pin cam type with 2 keys (standard)
- Optional locks – see page 12

DOOR LOCK IDENTIFICATION
- 5/8" x 2" number slot with plastic window (standard)
- Optional identification – see page 12

FINISH
- 628 natural anodized aluminum (standard)
- Optional finishes – see page 3

DIRECTORIES
- Side, separate and top mounted available – see page 13

SNAP-ON TRIM
- 9/16" x 1 1/2" extruded aluminum

CONTROL DOOR LOCK
- Prepared for U.S.P.S. lock and provided with slot and baffle for mail collection

Not U.S.P.S. approved

The Student Union building at the University of North Carolina– Greensboro has over 13,000 rear-loading Bommer mailboxes.

MODEL 6111

FRONT LOADING 6001 SERIES
REAR LOADING 6101 SERIES

Compartment sizes of the 6001 and 6101 Series do not comply with U.S.P.S. regulations. These models are particularly suited for private distribution, such as campus post offices, military installations, hospitals and other installations where mail is handled internally.

MODEL 6011/6111

The 6011/6111 are composed of all size "1" doors.

MODEL 6031/6131

The 6031/6131 models are the same as the 6011/6111 except they contain one or more multiple size doors. A layout must accompany all orders.

SPECIFICATIONS

COMPARTMENT SIZE
- 5" high x 3 1/2" wide x 15" deep (standard)

DOOR LOCK
- 5-pin cam type with 2 keys (standard)
- Optional locks – see page 12

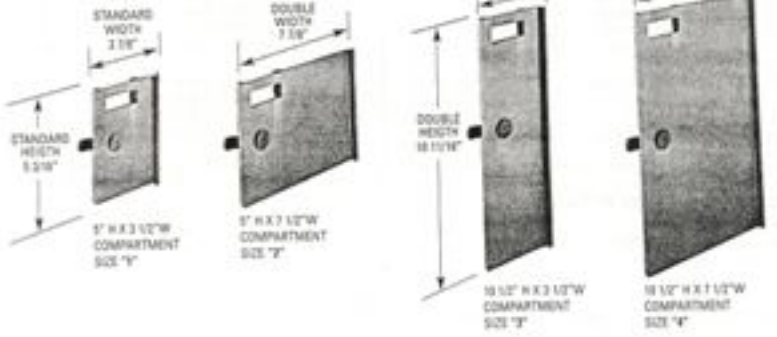
DOOR IDENTIFICATION
- 5/8" x 2" number slot, with plastic window (standard)
- Optional identification – see page 12

FINISH
- 628 natural anodized aluminum (standard)
- Optional finishes – see page 2

DIRECTORIES
- Side and separate and top mounted available – see page 13

SNAP-ON TRIM
- 9/16" x 1 1/2" extruded aluminum

OPTIONAL COMPARTMENT DOOR SIZES:



OPTIONAL LOCKS & DOOR IDENTIFICATION

FOR HORIZONTAL MAILBOXES

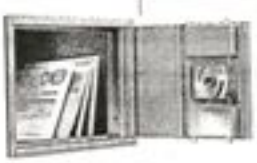
STANDARD CAM LOCK (670-07)
Bommer provides a cam type lock with 5-pin tumbler and 2 keys as standard equipment on all horizontal mailboxes. It can be supplied in 1,000 different key changes. To order replacement locks, contact factory.

The following locks are available as options for Bommer horizontal mailboxes:

SUPPLIED BY BOMMER

COMBINATION LOCK (672-01)
3-digit, single dial type with spring latch and automatic throw-off. For dormitories or other installations not serviced by the Postal Service.

SPRING LATCH TYPE LOCK (671-04)
Includes 5-pin tumbler cylinder 670-08 with 2 keys and spring latch housing. Can be supplied in 1,000 different key changes. Not compatible with 660-06 window on size "1" door.



4-POINT LOCKING SYSTEM
Provides added protection against break-ins. When locked, the door is secured at two points each, top and bottom, and by reinforced continuous interlocking extrusions at the pivot side. The five-pin lock is available with 1,000 key changes.

Note: Available only for Series HS6200 and HS6300 mailboxes.

SUPPLIED BY CUSTOMER

REMOVABLE CORE LOCK
Complete assembly, adapted by lock manufacturer to fit mailbox doors. Supplied by customer for installation by Bommer.

KEYED-IN CYLINDERS
Special cylinders keyed into building keying system, supplied by customer for installation with spring latch type housing. Cylinder numbers listed include special adaptation made by cylinder manufacturer. Not compatible with 660-06 window or size "1" door.

Assembly No.	Pins	Manufacturer
A7115	5	Best
A7116	6	Best
A7117	7	Best
6060-1260SA	5	Falcon
6060-1260SA	6	Falcon
6060-1260TA	7	Falcon

Cylinder No.	Manufacturer
9080	Dexter
954	Falcon
4101	Sargent
20-089	Schlage
145	Westcott
C1810	Yale
20-0108	Medeco

DOOR IDENTIFICATION:
Choose from a variety of door identification items for Bommer mailboxes

CARDBOARD STRIP NUMBER TAB (660-01)
Furnished as standard (15/32" high x 1 7/8" wide) with mailbox units. Numbers are printed on tab by owners. Use with 660-08.

CARDBOARD NAME CARD (660-05)
Supplied as standard (3/8" high x 3 1/2" wide) for listing patron's name on interior of mailbox compartment in channel type holder built into unit. Visible only to postman.

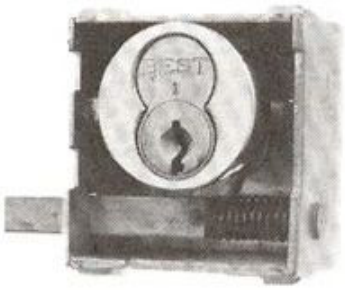
PLEXIGLASS WINDOW (660-06) Available as optional item (1 7/16" high x 2 1/4" wide). Not permitted on units serviced by the Postal Service. Must state series of boxes window will be used on. Not compatible with 671-04 on size "1" door.

LAMINATED PLASTIC NUMBER TABS (660-07) Black plastic engraved with white numerals (17/32" high x 2" wide). Available as optional items. Numbers to be engraved on tabs must be supplied with order. Use with 660-08.

TRANSPARENT PLASTIC WINDOW (660-08)
Furnished as standard window slot over cardboard or laminated plastic number tabs (1 7/16" high x 2 1/4" wide). Use with 680-01 and 660-07.

Note: Engraved 1/2" high number on door also available.

12



REMOVABLE CORE LOCK

Complete assembly, adapted by lock manufacturer to fit mailbox doors, supplied by customer for installation by Bommer.

Assembly No.		Manufacturer
A7115	5 pin	Best
A7116	6 pin	Best
A7117	7 pin	Best
6060-12605A	5 pin	Falcon
6060-12606A	6 pin	Falcon
6060-12607A	7 pin	Falcon

6200 SERIES INSTALLATION DETAILS

4 DOORS HIGH — Rough Opening 1'- 11 1/2"

Number of Tenants	Model Number (s) and Order Quantity	Postal Locks	Rough Opening Width
11	(1) 6210-62	1	1'- 8 7/8"
15	(1) 6210-64	1	2'- 3 3/8"

5 DOORS HIGH — Rough Opening 2'- 5"

Number of Tenants	Model Number (s) and Order Quantity	Postal Locks	Rough Opening Width
14	(1) 6210-63	1	1'- 8 7/8"
18	(1) 6210-64	1	2'- 3 3/8"
24	(1) 6210-65	1	2'- 8 7/8"

6 DOORS HIGH — Rough Opening 2'- 10 1/2"

Number of Tenants	Model Number (s) and Order Quantity	Postal Locks	Rough Opening Width
17	(1) 6210-62	1	1'- 8 7/8"
23	(1) 6210-64	1	2'- 3 3/8"
29	(1) 6210-66	1	2'- 8 7/8"
34	(2) 6210-62	2	3'- 5 9/16"
40	(1) 6210-62 (1) 6210-64	2	4'- 0 1/16"
46	(2) 6210-64	2	4'- 8 9/16"
52	(1) 6210-64 (1) 6210-65	2	5'-11/16"
58	(2) 6210-65	2	5'- 7 9/16"
63	(1) 6210-63 (2) 6210-64	3	6'- 3 1/4"
69	(3) 6210-64	3	6'- 9 3/4"
75	(2) 6210-64 (1) 6210-65	3	7'- 4 1/4"
81	(1) 6210-64 (2) 6210-65	3	7'- 10 3/4"
87	(3) 6210-65	3	8'- 5 1/4"
92	(4) 6210-64	4	8'- 0 15/16"
98	(2) 6210-64 (1) 6210-65	4	9'- 7 7/16"
104	(2) 6210-64 (2) 6210-65	4	10'- 1 15/16"
110	(1) 6210-64 (3) 6210-65	4	10'- 8 7/16"
116	(4) 6210-65	4	11'- 2 15/16"
121	(4) 6210-64 (1) 6210-65	5	11'- 10 5/8"
127	(3) 6210-64 (2) 6210-65	5	12'- 5 1/8"
133	(2) 6210-64 (3) 6210-65	5	12'- 11 5/8"
139	(1) 6210-64 (4) 6210-65	5	13'- 8 1/8"
145	(5) 6210-65	5	14'- 0 5/8"
150	(4) 6210-64 (2) 6210-65	6	14'- 8 5/16"
156	(3) 6210-64 (3) 6210-65	6	15'- 2 13/16"
162	(2) 6210-64 (4) 6210-65	6	15'- 8 5/16"
168	(1) 6210-64 (5) 6210-65	6	16'- 3 13/16"
174	(6) 6210-65	6	16'- 10 5/16"
179	(4) 6210-64 (3) 6210-65	7	17'- 6"
185	(3) 6210-64 (4) 6210-65	7	18'- 0 1/2"
191	(2) 6210-64 (5) 6210-65	7	18'- 7"
197	(1) 6210-64 (6) 6210-65	7	19'- 1 1/2"
203	(7) 6210-65	7	19'- 8"
208	(4) 6210-64 (4) 6210-65	8	20'- 3 11/16"
214	(3) 6210-64 (5) 6210-65	8	20'- 10 3/16"
220	(2) 6210-64 (6) 6210-65	8	21'- 4 11/16"
226	(1) 6210-64 (7) 6210-65	8	21'- 11 3/16"
232	(8) 6210-65	8	22'- 5 11/16"

7 DOORS HIGH — Rough Opening 3'- 4"

Number of Tenants	Model Number (s) and Order Quantity	Postal Locks	Rough Opening Width
20	(1) 6210-72	1	1'- 8 7/8"
27	(1) 6210-74	1	2'- 3 3/8"
34	(1) 6210-75	1	2'- 8 7/8"
40	(2) 6210-72	2	3'- 5 9/16"
47	(1) 6210-72 (1) 6210-74	2	4'- 0 1/16"
54	(2) 6210-74	2	4'- 8 9/16"
61	(1) 6210-74 (1) 6210-75	2	5'-11/16"
68	(2) 6210-75	2	5'- 7 9/16"
74	(1) 6210-72 (2) 6210-74	3	6'- 3 1/4"
81	(3) 6210-74	3	6'- 9 3/4"
88	(2) 6210-74 (1) 6210-75	3	7'- 4 1/4"
95	(1) 6210-74 (2) 6210-75	3	7'- 10 3/4"
102	(3) 6210-75	3	8'- 5 1/4"
108	(4) 6210-74	4	8'- 0 15/16"
115	(2) 6210-64 (1) 6210-75	4	9'- 7 7/16"
122	(2) 6210-74 (2) 6210-75	4	10'- 1 15/16"
129	(1) 6210-74 (3) 6210-75	4	10'- 8 7/16"
136	(4) 6210-75	4	11'- 2 15/16"
142	(4) 6210-74 (1) 6210-75	5	11'- 10 5/8"
149	(3) 6210-74 (2) 6210-75	5	12'- 5 1/8"
156	(2) 6210-74 (3) 6210-75	5	12'- 11 5/8"
163	(1) 6210-74 (4) 6210-75	5	13'- 8 1/8"
170	(5) 6210-75	5	14'- 0 5/8"
176	(4) 6210-74 (2) 6210-75	6	14'- 8 5/16"
183	(3) 6210-74 (3) 6210-75	6	15'- 2 13/16"
190	(2) 6210-74 (4) 6210-75	6	15'- 9 5/16"
197	(1) 6210-74 (5) 6210-75	6	16'- 3 13/16"
204	(6) 6210-75	6	16'- 10 5/16"
210	(4) 6210-74 (3) 6210-75	7	17'- 6"
217	(3) 6210-74 (4) 6210-75	7	18'- 0 1/2"
224	(2) 6210-74 (5) 6210-75	7	18'- 7"
231	(1) 6210-74 (6) 6210-75	7	19'- 1 1/2"
238	(7) 6210-75	7	19'- 8"
244	(4) 6210-74 (4) 6210-75	8	20'- 3 11/16"
251	(3) 6210-74 (5) 6210-75	8	20'- 10 3/16"
258	(2) 6210-74 (6) 6210-75	8	21'- 4 11/16"
265	(1) 6210-74 (7) 6210-75	8	21'- 11 3/16"
272	(8) 6210-75	8	22'- 5 11/16"

Minimum wall depth 16 1/2"

6200 SERIES ROUGH OPENING WIDTH FORMULA:

Multiply total size "A"
(or equivalent "A" doors wide) by 6.5 inches _____ =
Multiply total units by 1.1875 inches _____ = + _____

Total rough opening width _____ = + .1875 inches
inches

6001/6101 SERIES INSTALLATION DETAILS

FRONT LOADER 6001 SERIES

4 UNITS HIGH — Height Dimension: Mailbox 1'-10 1/2" Rough Opening 1'-11 1/2"

Number of Tenants	Model Number (s) and Order Quantity	Approx. Shipping Weight in Pounds	Control Locks	Rough Wall Opening Width
11	(1)6011-43	35	1	1'-1 3/8"
15	(1)6011-44	42	1	1'-5 3/8"

5 UNITS HIGH — Height Dimension: Mailbox 2'-4" Rough Opening 2'-5"

Number of Tenants	Model Number (s) and Order Quantity	Approx. Shipping Weight in Pounds	Control Locks	Rough Wall Opening Width
14	(1)6011-53	40	1	1'-1 3/8"
19	(1)6011-54	50	1	1'-5 3/8"
24	(1)6011-55	60	1	1'-9 3/8"

6 UNITS HIGH — Height Dimension: Mailbox 2'-9 1/2" Rough Opening 2'-10 1/2"

Number of Tenants	Model Number (s) and Order Quantity	Approx. Shipping Weight in Pounds	Control Locks	Rough Wall Opening Width
17	(1)6011-63	47	1	1'-1 3/8"
23	(1)6011-64	59	1	1'-5 3/8"
29	(1)6011-65	70	1	1'-9 3/8"
35	(1)6011-66	82	1	2'-1 3/8"

7 UNITS HIGH — Height Dimension: Mailbox 3'-3" Rough Opening 3'-4"

Number of Tenants	Model Number (s) and Order Quantity	Approx. Shipping Weight in Pounds	Control Locks	Rough Wall Opening Width
20	(1)6011-73	53	1	1'-1 3/8"
27	(1)6011-74	66	1	1'-5 3/8"
34	(1)6011-75	80	1	1'-9 3/8"
41	(1)6011-76	93	1	2'-1 3/8"
48	(1)6011-77	107	1	2'-5 3/8"

6001 SERIES ROUGH WALL OPENING WIDTH FORMULA:

Multiply total size "1" (or equivalent "1" doors wide) by 4 inches.... =
Multiply total units by 1.1875 inches..... + + _____
+ .1875 inches
Total rough opening width ..... = inches

6101 SERIES ROUGH WALL OPENING WIDTH FORMULA:

Multiply total size "1" (or equivalent "1" doors wide) by 4 inches.... =
Multiply total units by .8875 inches..... + + _____
+ .250 inches
Total rough opening width ..... = inches

REAR LOADER 6101 SERIES

4 UNITS HIGH — Height Dimension: Mailbox 1'-10 1/2" Rough Opening 1'-11 1/2"

Number of Tenants	Model Number (s) and Order Quantity	Approx. Shipping Weight in Pounds	Rough Wall Opening Width
12	(1)6111-43	35	1'-0 15/16"
16	(1)6111-44	42	1'-4 15/16"

5 UNITS HIGH — Height Dimension: Mailbox 2'-4" Rough Opening 2'-5"

Number of Tenants	Model Number (s) and Order Quantity	Approx. Shipping Weight in Pounds	Rough Wall Opening Width
15	(1)6111-53	40	1'-0 15/16"
20	(1)6111-54	50	1'-4 15/16"
25	(1)6111-55	60	1'-8 15/16"

6 UNITS HIGH — Height Dimension: Mailbox 2'-9 1/2" Rough Opening 2'-10 1/2"

Number of Tenants	Model Number (s) and Order Quantity	Approx. Shipping Weight in Pounds	Rough Wall Opening Width
18	(1)6111-63	47	1'-0 15/16"
24	(1)6111-64	59	1'-4 15/16"
30	(1)6111-65	70	1'-8 15/16"
36	(1)6111-66	82	2'-0 15/16"

7 UNITS HIGH — Height Dimension: Mailbox 3'-3" Rough Opening 3'-4"

Number of Tenants	Model Number (s) and Order Quantity	Approx. Shipping Weight in Pounds	Rough Wall Opening Width
21	(1)6111-73	53	1'-0 15/16"
28	(1)6111-74	66	1'-4 15/16"
35	(1)6111-75	80	1'-8 15/16"
42	(1)6111-76	93	2'-0 15/16"
49	(1)6111-77	107	2'-4 15/16"

8 UNITS HIGH — Height Dimension: Mailbox 3'-8 1/2" Rough Opening 3'-9 1/2"

Number of Tenants	Model Number (s) and Order Quantity	Approx. Shipping Weight in Pounds	Rough Wall Opening Width
24	(1)6111-83	59	1'-0 15/16"
32	(1)6111-84	73	1'-4 15/16"
40	(1)6111-85	90	1'-8 15/16"
48	(1)6111-86	107	2'-0 15/16"
56	(1)6111-87	124	2'-4 15/16"

Minimum wall depth 16 1/2"

APPENDIX C

Architectural Principles for MIT Undergraduate Residences

October 14, 2016

Division of Student Life

Massachusetts Institute of Technology
77 Massachusetts Avenue, Building 4-110
Cambridge, Massachusetts 02139-4307

UNDERGRADUATE HOUSING AT MIT

MIT's approach to learning is guided by the understanding that one learns best by doing, and then by sharing what they learn with others.[1] The residence halls are anchored in this mission, and are places where peer-to-peer relations, student-faculty engagement, and student-staff interaction have a profound effect on student development.

As MIT looks to its future, we embrace the importance of residential living communities to our educational model. Several students, faculty, and staff have developed the architectural principles herein (Appendix A: group charge), imagining undergraduate residential halls that are warm and inviting places where students learn together, socialize, and develop lifelong friendships.

A unique aspect of MIT's residential system is its commitment to shared governance as a means of strengthening students' involvement in campus life, developing positive relations with faculty and administrators, furthering their skills and knowledge, and promoting peer-to-peer interaction. Faculty-student engagement in residential life is a high-impact educational practice that has been well established. The *2004 National Study of Living Learning Programs* surveyed more than 24,000 students on 34 American campuses, with a follow-up study in 2007, and identified attributes that contribute most to students' growth, well-being, and sense of belonging: faculty involvement (usually in the form of teaching or advising), an emphasis on study groups in residence, peer engagement in community service activities, residence-based advising, recreational programs, social outings and events, cultural and intellectual programming, and team-building. [2]

MIT's residential living communities complement students' academic life, offering unique opportunities for learning and leadership. MIT students are actively involved in every aspect of dorm life and engage in residence hall governance, the room

---

[1] *Institute-wide Task Force on the Future of MIT Education Preliminary Report*. Rep. Massachusetts Institute of Technology, 21 Nov. 2013. Web. Appendix 5 of the Final Report, p.23

[2] *National Study of Living-Learning Programs*. Rep. National Science Foundation, Association of College and University Housing Officers International, ACPA: College Student Educators International, and NASPA: Student Affairs Administrators in Higher Education (NASPA), 2007. Web. http://drum.lib.umd.edu/handle/1903/8392.

assignment process, and community building. It is worth noting that the vast majority of MIT undergraduate students live in residence halls throughout their four years, and many stay in the same residence hall they lived in their first year on campus. These factors help make residence hall affiliation one of the strongest community bonds among undergraduates.

A review of published student housing research, recent MIT student surveys and housing and dining studies, and input from students, faculty, and staff across MIT have informed these recommendations.[3]

I. STUDENT SPACES

The Cluster Concept

The organizing principle of an MIT residence hall is a cluster of approximately 30 students and one graduate residence tutor (GRT). Though minor fluctuation up or down is acceptable if design constraints make it necessary, ideally, the cluster size would be 30 students. Each cluster would also have common space nearby.

The Critical Path

The path each student takes from the entrance to his or her room is that student's "critical path." How they travel through a building helps them interact with others and their environment. Ideally each resident's path would lead them past community-building spaces and through hallways bustling with activity: students engaged in cooking, music and dance rehearsals, projects under development, meetings, workouts, and games. The spaces where such activities take place should be highly visible and easily accessible. Ultimately, the critical path encourages peer-to-peer interaction.

Building Capacity

MIT has a goal of adding 700 new beds to the undergraduate housing system; however, building one large residence hall for all 700 students is neither desirable nor in keeping with the importance of fostering personal ties and building community.

---

[3] Sources include the *Housing Capacity Review* (2015), *Met Warehouse Schematic Design* (2015), *MetX Student Advisory Group Report* (2015), *Department of Facilities MIT Residences Thematic Folder* (2016), Student Housing Advisory Council presentation to the DSL Visiting Committee (2015), Student Housing Advisory Group focus sessions (2015-16), and recent student surveys.

A review of literature on residence hall design indicated that high-rise configurations resulted in a perception of crowding and social density. Further, high-rise buildings negatively influenced patterns of interaction and sense of community, and increased feelings of isolation. Likewise residents reported being less satisfied with long corridors, which felt more crowded and led to development of fewer relationships.[4]

A mix of long and short corridors in a "U-shape" or "double-tower" configuration would be optimal, with an ideal size of about 350 students, configured in smaller clusters of approximately 30. They would be supported by a faculty head of house, approximately 12 GRTs, one area director (AD), and a house manager in addition to mechanics and custodians. In circumstances where there are more than 350 residents, an associate head of house may be added to the house team.

Rooms and Sizes

Research suggested that double rooms off a corridor were an ideal housing design for first-year student housing. This rooming type leads to increased contact among residents and relationship building.[5] Students advising on the MetX project suggested that MIT should avoid triples as they "have a tendency to develop into a two versus one scenario." MIT's newer residence halls were built with fewer singles. In Maseeh, which opened in 2011, 16% of the beds are singles, 64% are doubles, and 20% are triples and quads. In Simmons, which opened in 2002, 45% of the beds are singles and 55% are doubles.[6]

Given the desire for a more efficient design, we recommend that new buildings have a target ratio of approximately 30-40% singles and the balance as doubles, allowing most (if not all) seniors to have a single and providing for accommodation needs. A mix of doubles and singles housing approximately 30 residents (and a GRT apartment) would form the residential cluster with approximately 10 single rooms and 10 double rooms per cluster. Floors should be organized horizontally, and residents should have access to all floors via stairways and ADA-compliant elevators.

---

[4] Blimling, Gregory S. *Student Learning in College Residence Halls: What Works, What Doesn't, and Why*. 1st ed. San Francisco: Jossey-Bass, 2015. Print. p. 181

[5] Blimling, Gregory S. *Student Learning in College Residence Halls: What Works, What Doesn't, and Why*. 1st ed. San Francisco: Jossey-Bass, 2015. Print.

[6] *MetX Student Advisory Group Report*. Cambridge, MA: Massachusetts Institute of Technology. Unpublished. p. 7

The below rooming types and square footage recommendations were guided by a review of the literature, the *2015 Met Warehouse Preliminary Design Study*, the *2015 MIT Undergraduate Housing Capacity Review*, and the *2016 MIT Department of Facilities Thematic Recommendations for Residence Halls*. The *2015 Housing Capacity Review* proposes minimum size and ranges for each room type based on Massachusetts sanitary code and MIT's housing needs and practices.

Design	State Code	Housing Study Guidelines	Proposed Program
Single	80-119 square feet	80-149 square feet	90 square feet (min.)
Doubles	120-179	150-224	180 square feet (min.)
Triples (min.)*	180-239	225-299	270 square feet
Quads (min.)*	240-299	300-443	360 square feet

*Triples and quads are not a preferred rooming type; however, if the architecture warrants a limited number of triples or quads, 90 square feet should be added per occupant.

Furniture

Standard residence hall furniture should be used, including XL twin beds (with loftable head- and footboards), wardrobes with drawers and a mirror, dressers incorporating three or five drawers, and 4' and 6' bookshelves, all in oak finish. A couple of desk size options should be made available to suit residents' preferences. All desks should be in oak finish, with multiple drawers, loft bookshelf, and drawer pedestal. The desk chair is a Sauder upholstered armless chair.

Residents should have the flexibility to disassemble and reconfigure some of the standard furniture. Also the building should have sufficient lockable storage space to hold unused or unwanted furniture during the school year.

Specifications call for much of the furniture to be on casters. However student feedback suggested that wheeled furniture may pose a hazard in certain circumstances, and wheel-less furniture can be moved with only a little more difficulty. This matter bears additional discussion as project development gets underway.

Bathrooms

All bathrooms will be compliant with local, state, and federal guidelines on handicap and gender accessibility. They will also be accessible directly by the hallways to allow for ease in maintenance and cleaning. Ideally, each cluster will have three bathrooms to allow for gendering based on the cluster's preference. Standard fixtures consists of a water closet (toilet), lavatories (sinks), and showers. Urinals are not to be used. The student-to-toilet ratio should be 1:6 in new residence halls. This is the Massachusetts code minimum for women, and better than the code minimum for men.

Bathrooms should allow for maximum privacy with lockable floor-to-ceiling doors on toilets and showers that provide adequate privacy. There should be soap dispensers, hand dryers, adequate shelving, and power outlets near sinks. In shower areas, hooks should be installed to accommodate residents' clothing and toiletries. If space is available, drying areas with a bench might be considered to enhance convenience and privacy.

II. EATING AND FOOD

Food and eating are fundamental to building a positive residential experience and are important to all students whether they live in dining dorms or cook-for-yourself communities. Dining spaces create opportunities for socialization such as meeting a professor over a meal, studying in a group while cooking, or hosting community gatherings and events. *MIT's 2015 Enrolled Student Survey* showed:

- 64% of students "agree" or "strongly agree" that "Meals are an important part of my residential experience."
- 56% of students "agree" or "strongly agree" that "Eating meals together is important to members of my eating group."
- 79% of students "agree" or "strongly agree" that "I have the opportunity to socialize with other students when I eat meals.

How students eat in the context of their residential community generally falls into two categories:

House Dining - There are five undergraduate residences with dining halls. These facilities each incorporate a full kitchen and dedicated dining room. Some dining rooms have removable furniture, which allows those spaces to be used in other community building activities. All students who live in residences with dining halls are required to be

on an MIT dining plan. Since its introduction in 2011, participation in the dining plan has grown significantly.

Cook-for-Yourself - As the name suggests, students who choose to cook for themselves prepare their own meals in kitchens spread throughout residences without dining halls. Kitchens help foster community, are used as social spaces, and promote healthy living and self-reliance. In recent surveys, more than half of new students report they like to cook often or sometimes, and nearly one third would like to learn how to cook.[7]

Deciding whether a new residence hall should have a dining hall or be a cook-for-yourself community is outside the scope of this document. The design of spaces where students eat should be considered and ultimately tailored to each community's needs.

Dining Halls

A dining hall should incorporate a full commercial kitchen and seating for up to 75% of the building's total residential population, with additional space considerations for students from cook-for-yourself communities who are on dining plans. The space should be partitionable into smaller spaces suitable for 30-40 people, which could be used for meals shared by affinity groups or student organizations. Furniture should not be fixed to the floor, allowing students to reconfigure the space and enable social and academic interactions. The furniture should be removable and stackable to allow the dining hall to double as community-building space suitable for events.

Dining halls should have separate exterior entrances to simplify access for non-resident and faculty diners, and for functions hosted by the community. Adequate gender-inclusive restrooms should be located near the dining hall and accessible to all diners without a card swipe.

Kitchens

The 2016 MetX Student Advisory Group noted that kitchens were an important part of the residence hall living experience. All new residence halls—both dining and cook-for-yourself—should have kitchens that incorporate a four-burner cooktop, oven, microwave, large refrigerator with a sizeable freezer, and dishwasher. Each should have ample counter space for ingredient preparation, and numerous cabinets for storing food, utensils,

[7] Division of Student Life. *Class of 2019 Freshman Housing Survey* and *Class of 2020 Freshmen Housing Survey*. Cambridge, MA: Massachusetts Institute of Technology. Unpublished.

and small appliances. Kitchens should also incorporate nearby seating for groups of 8-10 people.

The ratio of kitchens to clusters should be different for dining dorms and cook-for-yourself communities. For a dining dorm, there should be a minimum of one kitchen for every 50 students; alternatively, three clusters could share an expanded kitchen with two cooktops, ovens, and large refrigerators. This ratio is similar to current campus dining dorms.

In cook-for-yourself dorms, there should be kitchens with a minimum ratio of one cooktop, oven, microwave, and large refrigerator for approximately 10 students. This could be designed as multiple smaller kitchens with one cooktop, oven, microwave, and refrigerator, or fewer larger kitchens with multiple cooktops, ovens, microwaves, and refrigerators. This is in keeping with the design of existing cook-for-yourself communities.

Additionally both dining and cook-for-yourself communities ideally would have "country kitchens" that can be used as a teaching kitchen, and a place to cook with friends and to share meals. These facilities would incorporate multiple full kitchens with the same complement of appliances and as much preparation and storage space as cluster kitchens. Adjacent to the kitchens would be seating for up to 50 people, which could be a multi-purpose space. The furniture in this space would also be movable and stackable, to allow the space to be used in other capacities.

All kitchens should be easy to clean, incorporate floor drains, and have durable appliances that can stand up to frequent use.

Teaching and Shared Dining Kitchen Concepts

In light of students' desire to learn how to cook, where "country kitchens" are used in both dining and cook-for-yourself communities for this purpose, local chefs could be commissioned to teach a range of classes, from safe food-handling techniques, to basic food preparation, to advanced cooking methods.

Also we encourage architects to investigate an approach to dining halls at the California Institute of Technology (Caltech) which features a central kitchen shared by four residence halls. The kitchen prepares meals which are shared through serveries to four separate dining rooms, one in each residence hall. Such an approach would be in keeping with MIT's sustainability efforts, and allow for multiple communities to bond over shared meals while maintaining their own distinctiveness.

III. SHARED SPACES

Entryways – Building entrances should be situated conveniently in relation to the campus and in context to the building's overall design. Entryway common areas should also accommodate large numbers of residents, be suitable for families during move-in and move-out, and allow easy access to and egress from the building.

While security is a necessity for each residence hall, the security desk should not dominate the entryway. Instead, the entryway should be both welcoming and representative of the community's culture.

A student worker desk separate from the security desk should be situated near the entrance, adjacent to the mailboxes. Student workers should have ample space for storing packages, small appliances (e.g., vacuum cleaners, sewing machines, irons), DVDs, video games, and other amenities. They would also be responsible for distributing mail to mailboxes.

Community-Building Space - *The 2016 Department of Facilities MIT Residence Thematic Folder* notes "all Houses should include space for music practice, a game room, floor lounges for study and TV/movie watching, multiple meeting/study rooms, exercise/activity space, bicycle storage, large event/dining space, and community kitchens/efficiencies."

An increasing number of students are athletes, artists, or musicians, with more than a quarter of recent incoming undergraduate classes identifying as engaging in a range of these activities. While it is recognized that some rooms should be "hard-coded" single-function rooms (such as art studios, music rehearsal rooms, and gyms), the majority of community-building spaces should be flexible enough to support a wide variety of activities, from social gatherings to academic sessions—such as recitations, tutoring, and mentoring sessions—to private meetings. Many of these spaces should be available by reservation only, while some should be open to any residents for spontaneous use. It should be noted that while flexibility is ideal, the ventilation, power, and AV requirements for some of the aforementioned functions may not be interchangeable.

Whiteboards should be available in all community-building spaces, hallways, and other strategic locations where students congregate. Where necessary, glass walls will help increase visibility into the spaces, and provide writing surfaces.

Additionally each cluster should have its own lounge for informal social gatherings and

shared academic work in addition to the gathering space adjacent to the kitchen. These spaces should not have doors (where practical) to communicate a sense of the activities going on inside as students travel along their critical paths.

Per the *2016 Met Warehouse Schematic Design Study*, the average undergraduate housing common space is 52 square feet. In keeping with the existing average, on a per-student basis, community building space should account for approximately 45-50 square feet per resident.

Project Spaces - *The 2015 Final Report on the Institute-wide Taskforce on the Future of MIT Education* calls for a system of makerspaces that will help to hold "our educational principles and values steady given an anchor in experiential learning and practical arts." The report notes, "Makerspaces are places for communities of people who have a passion for making things, and who want to share that passion by making with others."[8]

Given their community focus, makerspaces in residence halls could be ideal and should be integrated into a building design, reinforcing the *mens et manus* ethos. That said, makerspaces will add to the planning schedule and project costs given the need for space and ventilation; hence, the design should be relatively simple. A makerspace in the residence hall should have an appropriate scope that would not require dedicated on-site personnel to oversee the safety and maintenance or to provide training. Consideration should be given to security and access for residents and non-residents, and the types of equipment in the space to ensure good air quality and overall student safety. For more complex tools or for training, MIT's Mobius App is available to help the students gain access to other campus makerspaces. The new Victor and William Fung makerspace in the Metropolitan Warehouse will be one of these options. Typical makerspace should be large and well lit with high ceilings and appropriate ventilation. The spaces would accommodate numerous workbenches, and lockable storage of various sizes for storing hand tools, materials, and work in progress.

Makerspace should be designed to get dirty—imagine paint-splatters and use marks on the floors, walls, and benches—but be very easy to clean. And, since such space usually generates significant noise, dust, and fumes, it should be situated away from living spaces. Project work, however, is not restricted to just a fixed makerspace. A flexible approach to community-building space should allow students to do projects in multiple locations around the building.

---

[8] *Institute-wide Task Force on the Future of MIT Education Preliminary Report*. Rep. Massachusetts Institute of Technology, 21 Nov. 2013. Web. Appendix 5 of the Final Report, p.38

Approximately 25-30% of total makerspace square footage should be counted as community-building space.

Pathways and Corridors - The act of getting from one place to another in a residence hall should be an educational experience for students, utilizing all aspects of the structure and environment. *The 2016 MetX Student Advisory Group* noted, for example, that location of the stairwells can "improve the flow of people through the building and help to increase the usage of the central common areas and thus a larger sense of community in the dormitory." In this example, utilizing automatic fire doors would allow egress stairwells to remain open and be more inviting. This would extend the stairs' value beyond simple utility and encourage socialization among floors. Even the corridors and floors can offer work and hangout space given comfortable carpeting, furniture, and other amenities.

Exterior Spaces – Like other community-building spaces, exterior space should be flexible and useable all year, even in winter. For example, students like to grill in the BBQ pits in winter, but care must be taken to ensure grills comply with code requirements for outdoor flames, and that residents using the exterior spaces do not track the weather in with them. Installation of metal gratings over catch-basins that allow residents to shake off rain, snow, and mud from their clothing and boots by doors leading to exterior spaces is advisable.

One large, well-positioned exterior courtyard is preferred over multiple small, disjointed areas. The courtyard should be closed to passersby, but with a gate that can be opened in a way that allows the community to host outdoor events safely and securely.

Some landscaping and permanent fixtures (such as grills) should be incorporated, but pushed to the margins of the space, leaving the majority open for flexible use. When situating the courtyard in the context of the building itself, the designers should be mindful of weather patterns (e.g., where does the sun rise and set), and the building's effect on wind in particular. Other communities' exterior spaces are positioned in a way that makes them very windy under certain conditions, which should be avoided.

Laundry - *The 2016 MetX Student Advisory Group Report* states, "Many of the dormitory presidents that we spoke with told us that, at ratios of approximately 30 students per washer, the laundry systems present in residence halls now is inadequate for the needs of students." They recommend that the laundry facilities be in a convenient location, but far enough away to minimize disturbing residents with noises and odors.

Laundry facilities should be well lit with an adequate number of machines, at a ratio of

about one washer and dryer per 20 residents. The laundry room doors should be automatic or operated by push-button, allowing residents to open the door without dropping their laundry.

The laundry rooms should incorporate floor drains, a slop sink, folding tables, and space for ironing clothes. To prevent neglected loads of laundry from taking up washers or dryers, laundry rooms should include cubby holes or baskets. Loads of laundry that have been forgotten can be loaded into these storage areas, freeing up the machine for others to use.

Flooring – Carpeting is suitable for corridors, common areas, and some community-building spaces. The selected carpet should be durable, but soft enough for bare feet and comfortable to sit on. Wall-to-wall carpeting should be avoided in residents' rooms to prevent against particulate contamination leading to allergic reactions.

Walls and Lighting – Walls in multi-use and academic areas should have whiteboards or glass panels that allow users to write in marker during meetings.

The building design should incorporate large windows in key places to allow for copious natural light to get deep into the building. All lightbulbs should be energy efficient and easy to change. As much as possible, lights in student rooms, common spaces, and community-building spaces should be locally controllable with dimmer switches to permit flexible use. For the sake of sustainability, they may also be put on timers or motion detectors but should not be controlled by remote or secured systems that require disturbing house team members to use.

Other Utilities – Technology design should be included early in the building design process to ensure the proper configuration of the network and power infrastructure needed to support all specified, technology-enabled systems. Amenities such as flat panel displays, AV systems in community-building space, online room reservation systems, room signage displays, keyless locking systems, and perimeter security requirements should be established up front to ensure proper design of physical requirements (e.g., wiring chaseways) and hardware requirements (e.g., network cabling, Wi-Fi transmitters). Also any building systems that require network access (e.g., HVAC, plumbing) should be incorporated in the technology design as early as possible.

At minimum the pillow-to-port ratio should be 1:1, but higher is better in the event that a student's Ethernet connection is malfunctioning. The WIFI signal should be strong and even throughout the building. Additionally, care must be taken to ensure consistent and strong cellular reception in the building to accommodate the multitude of mobile devices

used by residents.

Power outlets should be plentiful in all rooms. In larger community-building spaces, jacks should be built into floors to allow for the setup of AV systems for events. Power backups should also be incorporated to ensure continuous operation of critical building systems and emergency lighting during outages.

Sustainability – MIT aspires to create sustainable, high-performance buildings and responsible site strategies. All new construction and renovation projects should comply with the "Sustainable Design Standards" section of *The MIT Building Systems Design Handbook*. These standards require all new construction and major renovation projects to earn the US Green Building Council's Leadership in Energy and Environmental Design (LEED) gold certification, version 4. Partial renovation and limited-scope projects are also encouraged to pursue LEED certification in the commercial interiors program, version 4.

In addition to these standards, each project team should evaluate and implement project and site-specific sustainability strategies to address the following sustainable design principles:

- Energy Efficiency
    - Provide a project environmental impact statement that will include a feasibility analysis of renewable energy potential for this project and an assessment of this project's anticipated greenhouse gas emissions impact.
    - Evaluate passive and active design strategies to optimize energy efficiency, including but not limited to design options for building massing, building envelope systems, natural and mechanical ventilation strategies, heating and cooling systems, daylighting, and lighting design.
    - Coordinate the project's measurement and verification strategy with Campus Construction's Systems Performance and Turnover Group, and Systems Engineering Group.
- Water Use Reduction
    - Exceed the LEED prerequisite baseline for interior water use reduction (>20% reduction).
    - Provide a feasibility study of innovative ways to reduce, track, manage, and reuse water on site.

    - Evaluate integrated landscape and stormwater strategies for their environmental and human health impacts.

- Waste Management
    - Consider site and building design strategies to optimize materials flow and reduce waste streams.
    - Comply with the LEED MR credit for construction and demolition waste management (75% diversion or <2.5 lbs. of waste per square foot of floor area).
    - Coordinate with MIT's Office of Sustainability to consider how the building design can support zero-waste behavior by occupants.
    - Incorporate secondary waste utilization methods for kitchen and dining hall waste.
- Healthy Indoor Environment
    - Comply with the LEED MR credit for building life-cycle impact reduction as a tool to optimize the environmental performance of products and materials specified for the building project.
    - Document the "green cleaning" program that will be used in the building, including products and protocols.
    - For projects with dining facilities, coordinate with MIT's Office of Sustainability to explore a sustainable approach to the design of food systems on campus.
- Occupant Engagement and Learning
    - Conduct a study of occupant behavior in existing residence halls in order to inform strategies for energy-efficient design in new buildings.
    - Include an interactive system to make building performance data accessible to building occupants in order to encourage energy-efficient behaviors.
    - Coordinate with MIT's Office of Sustainability to explore how the building can be designed as a "living lab" with educational opportunities for building occupants and visitors.

While striving to meet these goals, new residences should include air conditioning with

zoned temperature controls. Students currently install or jury-rig portable and window-unit air conditioners in their rooms, which have a significant impact on the environment and are notoriously inefficient. There is significant subjective data on the prevalence of window AC units in residence halls that suggests widespread use across campus. With central air, the need for window AC units is negated, and the net decrease in energy usage and various types of pollution would likely offset the environmental impact of a full HVAC system. This would also allow buildings to be used for summer conferences. The design should include passive energy reduction techniques, such as windows set into deeper walls to shield the interior from direct rays during the hottest part of the day.

Beyond environmental controls, buildings should have facilities for other environmentally friendly pursuits, which influence student well-being as well as sustainability goals. These may include gardening, green roofs, and bee- and bat-keeping.

V. RESIDENTIAL STAFF LIVING SPACES

Based on historical practice and program needs, the *2016 Department of Facilities Design Standards* recommends that each undergraduate residential hall has space for the faculty head of house, area directors (ADs), visiting scholars, and GRTs. Some houses also have resident-peer mentors (RPMs) who would reside in singles and live among their mentees. This document also recommends adding an associate head of house for communities larger than 350 residents.

Average head of house accommodations should be 1,600 - 2,000 square feet, incorporating three bedrooms, two-and-a-half baths, a living room, dining room, kitchen, office, and laundry. Associate heads of house should be 800 - 1,200 square feet minimum, with two bedrooms, one-and-a-half to two baths, living room, dining room, kitchen, office, and laundry. Area directors and visiting scholars should be 550 - 700 square feet minimum, incorporating two bedrooms, one bathroom, living/dining room, and kitchen.

Each GRT apartment should be located in a student cluster, ensuring adequate oversight and community-building among residents. Their apartments should have 300 - 450 square feet minimum, one bedroom, one bathroom, living/dining room, and kitchen. It is important to note that GRTs often have families with small children. They also frequently cook and share meals with students in their cluster, so groups of up to 10 students should fit comfortably in the GRT's apartment.

For instances when residential staff meet with groups of students and their apartment is either too small or not available, having a dedicated space designed to feel like a homely extension of the head of house, AD, or GRT apartment would be sensible. Because of the sensitive nature of their work with residents and the potential presence of young children in their apartments, it is recommended that the doors and walls in apartments and facilities for heads of house, ADs, and GRTs be sound-proofed.

VI. SUPPORT STAFF SPACES

The *2016 MIT Department of Facilities Design Standards* note that facilities for support staff should include the following:

1. Lobby security desk high enough to provide unobstructed views of entry points, lobby areas, and guests even while the security staff member is seated. The desk should not, however, dominate the entrance. The desk should include lockable storage drawers to facilitate lock-out key procedures. There should be space for installation of video monitors, a desktop computer or laptop with docking station, and analog or VOIP phones and AIPHONE video console. Space under the desk can be used for installation of a desktop computer, provided there is adequate leg room.

2. Staff break rooms, which incorporate a microwave oven, room for a small dining table and chairs, a bathroom and possibly a shower, and lockers for storing personal belongings.

3. For efficiency, the maintenance mechanic shop should service multiple residences in a zone system. The zone office can be outfitted with office and computer, workshop, supply and tools storage.

4. Storage space for MIT residence hall furniture and cleaning supplies. Bicycle storage will comply with city ordinances, and be located convenient to the building's main entrance.

5. House manager's office on the first floor, with space for meeting with students and a glass window on the lobby to be visible by residents.

6. Area director's office on the first floor, with space for meeting with

students.

7. Flexible office space on the first floor for use primarily by Student Support Services, mental health staff, or MIT Medical.

8. “Food bank” space as needed to ensure the availability of food during inclement weather or other emergencies.

Appendix A - Group Charge

The Architectural Principles for MIT Undergraduate Residences Group will develop a document that synthesizes information from various sources—including MIT reports and surveys, regulations, and industry standards—relating to ideals for academic, social, residential, and dining spaces in residence halls. This architectural principles document will inform pre-design of new residence halls at MIT. Other groups of students, faculty, and staff will review increasingly refined building designs later in the process of developing a new student residence.

This group will consider ideal programming for new residence halls, including sustainable design, room types and mix, capacity, dining spaces, affinity housing, house team accommodations, social and academic spaces (such as art-making rooms, advising, and mentoring spaces), and administrative space to support residence hall operations. MIT has undertaken many studies in recent years to learn more about residence hall design and usage. The group will consider these findings, consult with campus stakeholders, and review student housing literature as a means of developing an architectural principles document that will inform the future design of residence halls at MIT.

Group Membership

- Suzy Nelson, *Vice President and Dean for Student Life*, Convener
- Matthew D. Bauer, *Director of Communications and Special Assistant to the Dean, DSL*
- Lilly Chin ’17, *East Campus* (Proxy for Isaac B. Grosof)
- Dennis Collins, *Director of Residential Life for Capital Renewal, Renovation, and Construction, DSL*
- Elizabeth Cox ’18, *Baker House*
- Peter Cummings, *Executive Director for Administration, DSL*
- Stephanie L. Eiler ’19, *New House*

- John Essigmann, PhD, *William R. (1956) & Betsy P. Leitch Professor in Residence, Professor of Chemistry, Toxicology, and Biological Engineering, Head of House for Simmons Hall*
- Kathryn M. Farris ’17, *Simmons Hall*
- Elizabeth Green, *Senior Project Director for Assessment, DSL*
- Isaac B. Grosof ’17, *Random Hall*
- Kim Haberlin, *Senior Communications Officer, Chancellor’s Office*
- Jennifer Hapgood-White, *Associate Director of Housing Assignments, DSL*
- Yuge Ji ’19, *Simmons Hall*
- Clare Keenan ’18, *New House (Proxy for Stephanie Eiler at first meeting)*
- Jag Patel ’97, *Director of Special Projects, Chancellor’s Office*
- Allan E. Sadun ’17, *East Campus*

END OF DOCUMENT