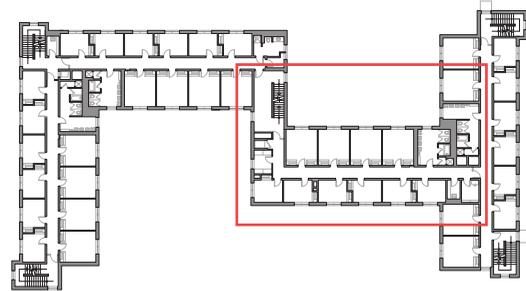


7.0 APPENDICES

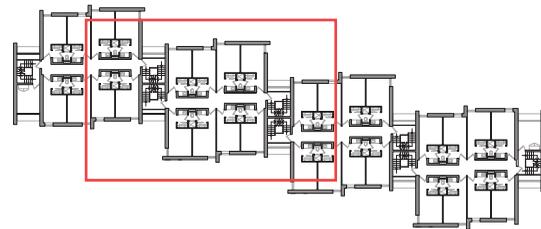
Existing Campus Housing Types



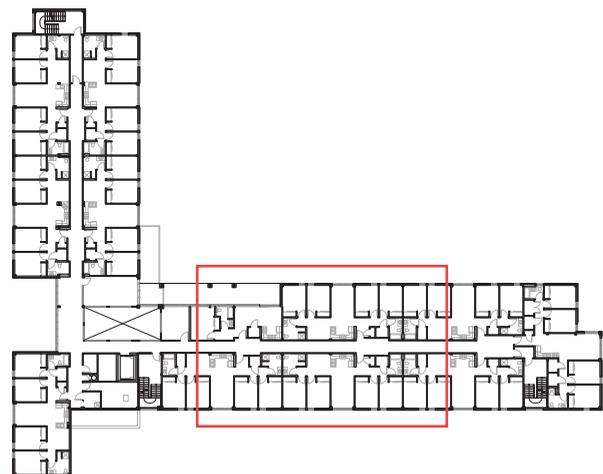
Mackinnon Hall, 1959

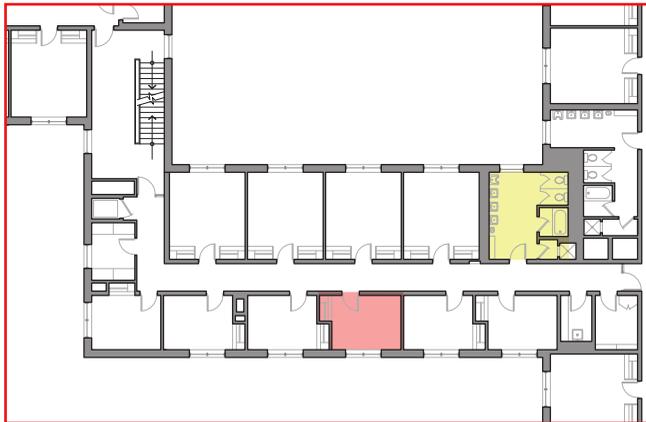


Munster, Keuhner, and Abbott Halls, 1964-1966



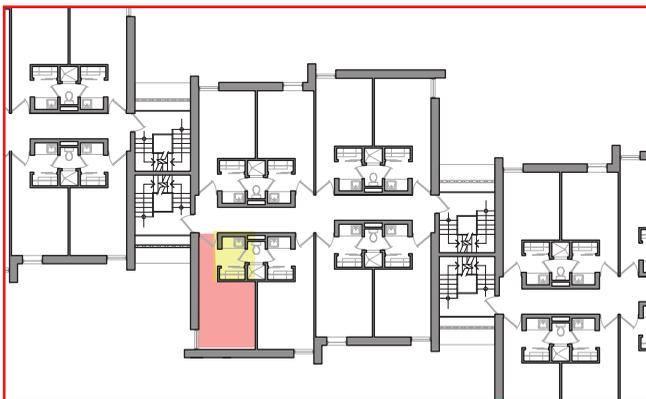
Paterson Hall, 2004





Typology: Singles and doubles along a double-loaded corridor with common (shared) bathrooms at each floor

Number of beds:	112
Average double bedroom size:	17.8 sq. meters
Average single bedroom size:	11.1 sq. meters
Square meters per student:	40 sq. meters
Common rooms:	3
Total social space:	274.7 sq. meters



Typology: Single grouped rooms (pods) with private bathrooms. Each pod accessed by dedicated stairwells.

Number of beds:	96 (x3)
Average single bedroom size:	10.4 sq. meters
Square meters per student:	36.3 sq. meters
Common rooms:	2 (x3)
Total social space:	142 (x3) sq. meters



Typology: Suites with private baths and kitchens along a double-loaded corridor.

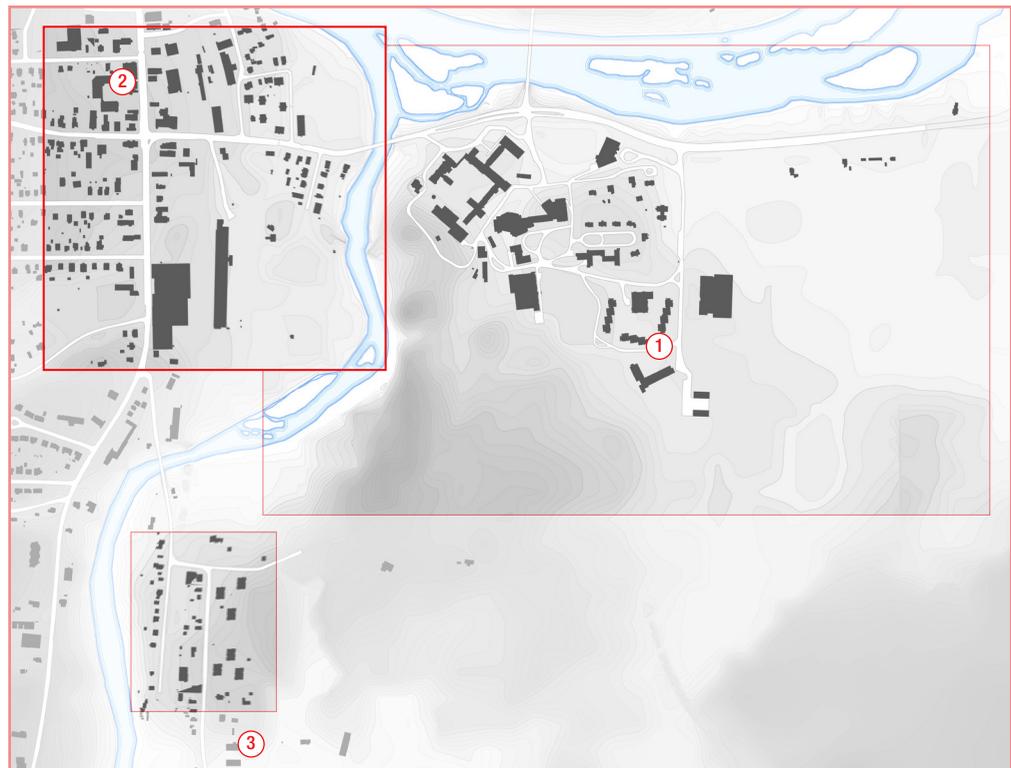
Number of beds:	165
Average single bedroom size:	11.6 sq. meters
Square meters per student:	42 sq. meters
Common rooms:	5

- Bedroom
- Bathroom

Appendix

Off-Campus housing

- ① Bishop's On-Campus Housing
- ② Off-Campus Housing
- ③ Champlain Housing



Lighting

Technical Design Requirements

Fixture Selection

Outdoor light fixtures or product group recommended for use on the Bishop's campus are scheduled in this document. Alternates should exhibit construction, optical characteristics and lamping of comparable quality as a prerequisite for consideration.

Desired Light Levels

The following specifications describe ideal lighting conditions in various campus settings. Departures from these standards due to special circumstances, should be evaluated and authorized by the Building and Grounds Department or the Campus Planning Oversight Committee:

1. Pedestrian Walkways / Bikeways (Adjacent to Roadways). Pedestrian walkways and bikeways adjacent to roads shall be designed for an average maintained illuminance value (Eavg) of 0.6 footcandle horizontal, and 1.1 footcandle vertical, as measured 6'-0" above ground, and shall maintain an avg/min illuminance uniformity ratio not to exceed 4:1. (This means that if the average illuminance at the ground plane is 0.6 footcandles, the minimum illuminance shall not be lower than 0.15 footcandles.) These values are in accordance with the Illuminating Engineering Society of North America (IES) Handbook, Ninth Edition.
2. Pedestrian Walkways / Bikeways (Distant from Roadways). Pedestrian walkways distant from roads and

bikeways adjacent to roads, a minimum average maintained horizontal illuminance value (Eavg) of 0.5 footcandles to identify obstacles on the pavement, and vertical illuminance of 0.5 footcandle measured 6'-0" above ground, and shall maintain an average/min illuminance uniformity ratio not to exceed 5:1. (This means that if the average illuminance at the ground plane is 0.5 footcandles, the minimum illuminance level shall not be lower than 0.1 footcandles). Also important to security is a luminous environment which extends out from the pavement and for a reasonable distance into the adjacent area. This extension should range at least six feet on either side of the pavement and have at least 1/3 of the value of the average illuminance level on the pavement. These values are in accordance with the IES Handbook, Ninth Edition.

3. Signage lighting, when used, should comply with the following requirements:
 - Fixtures illuminating signage shall have precision optics so as not to throw light beyond the sign. Specify appropriate shielding accessories for the fixtures.
 - Whenever possible, signage should be illuminated from above using shielded fixtures to restrict and avoid night sky light pollution.
 - Lamping shall be metal halide lamps, LED or fluorescent light sources of 4000K CCT, and 80+ CRI.
 - Illuminance values measured vertically on the signage surface should not exceed 20fc average maintained, with a maximum to-minimum ratio of 4:1. For special applications that might require higher illuminance levels, the Office of University Architects and the Building and Grounds Department shall be informed.
 - Fixtures used for signage applications should have lockable aiming, easy maintainability, and wher-

- ever possible, integral transformers instead of remote (except in case of LEDs).
4. Primary Building Entries. Lighting of building entrances provides a transition from a low exterior light level to much higher light levels inside while entering, and vice versa while exiting a building. As a rule, this lighting should follow criteria of exterior lighting discussed earlier, but with some alterations as described.
 - This shall be provided by using wall surface mount or wall recessed fixtures, and ceiling surface or recessed fixtures where they can be easily accessed and relamped. No fixture shall be mounted above the height of 20'-0" A.F.G. without prior approval from the Building and Grounds Department or the Campus Planning Oversight Committee.
 - Decorative fixtures shall be used in these locations only if approved by the Building and Grounds Department or the Campus Planning Oversight Committee.
 - An average maintained illuminance value (Eavg) of 3.0 footcandles and an average/minimum illuminance uniformity ratio of 3:1 measured at the ground plane will be provided within the footprint of the entrance area. If these fixtures also function as emergency egress lighting, ensure that the egress criteria given below and as per NFPA are met.
 5. Exterior Emergency Egress Lighting
 - Emergency egress sources shall be mounted above the doors to minimize glare wherever possible. At secondary building entrances, a single compact fluorescent fixture shall be centered directly above the door(s).
 - LED fixtures may be used for these applications, but must be approved by the Building and Grounds Department or the Campus Planning Oversight Committee.
 - Provide an average maintained illuminance value (Eavg) of 1.0 footcandles and an average/minimum illuminance uniformity ratio of 10:1 measured at the ground plane. Lighting shall be designed to provide a minimum of 0.1 footcandle measured at the ground plane at a distance not less than 2 times the fixture mounting height and shall have IES full cutoff classification.
 6. Service Area Lighting. These shall be designed to provide the necessary average illuminance levels required based on the specific task in accordance with the IES Handbook, Ninth Edition. The luminaires used should be provided with shielding accessories such as glare shield, louvers or barn doors to avoid glare. As far as possible, fixed wall/column mounted full cutoff type luminaires shall be used for area lighting and adjustable floodlights shall be avoided due to light pollution concerns.
 7. Surface Parking Areas. Illuminance levels for most campus parking lots are based on low-use criteria, while a few parking areas fall into the medium-use category. Uniformity and glare control are the most important factors in parking area lighting design because they contribute the most to nighttime visibility. These factors should take precedence over measured light levels. Vertical illumination is also important for motorists to be able to see pedestrians or obstructions such as curbs or poles; it is also critical for facial recognition and threat detection. Finally, care should be taken to avoid shadows and minimize light pollution and trespass.
 - Pole mounted IES full-cutoff fixtures or cutoff fixtures with max 2% upward lumens will be used for parking lot lighting. Off-street parking and small parking lots may be lit using the standard decorative pole, provided illuminance requirements listed below are met.

Appendix

- All parking lots on campus shall be illuminated in the same way. Provide a maintained average illuminance of 2 footcandle over the parking surfaces, with a minimum level of 0.2 footcandle at the ground plane, a minimum vertical illuminance of 0.1 footcandle measured 5'-0" above the ground plane, and a max/min uniformity ratio of 20:1 (this means that if the minimum is 0.2 footcandle, the maximum footcandle level shall not be higher than 4.0 footcandles).
- These values are based on the Ninth Edition of the IES Handbook. Justification for exceeding the minimum standards shall be submitted to the Building and Grounds Department or the Campus Planning Oversight Committee during the design phase.

8. Roads

- Collector (Intermediate Use) Roads. Collector roadways shall be designed for an average maintained illuminance value (Eavg) of 0.9 footcandle and shall maintain an average/minimum uniformity ratio not exceeding 4:1 (this means that if the average number of footcandles at the ground plane is 0.9, the minimum footcandle level shall not be lower than 0.23 footcandles). These values are in accordance with the IES Handbook, Ninth Edition.
- Arterial (Collector/Residential Use) Roads. Arterial roadways shall be designed for an average maintained illuminance value (Eavg) of 0.6 footcandles and shall maintain a uniformity ratio not to exceed 4:1 average/minimum. (This means that if the average number of footcandles at the ground plane is 0.6, the minimum footcandle level shall not be lower than 0.15 footcandles.) These values are in accordance with the IES Handbook, Ninth Edition.
- Local (Intermediate Use) Roads. Local roadways shall be designed for an average maintained illuminance value (Eavg) of 0.7 footcandles and shall maintain a uniformity ratio not to exceed 6:1 average/minimum. (This means that if the average number of footcandles at the ground plane is 0.6, the minimum footcandle level shall not be lower than 0.12 footcandles.) These values are in accordance with the IES Handbook, Ninth Edition.

Demonstration of Compliance

Point-by-point photometric plans of these applications, using software such as AGI32 or Visual, should be provided for University review. The calculations shall consider all light loss factors – lamp lumen depreciation, luminaire dirt depreciation and 16 of 66 ballast factors. In case of fluorescent lamping, light losses expected due to cold weather shall be accounted for in the design/specification of the system. Justification for deviating from the standards should be submitted to the Building and Grounds Department or the Campus Planning Oversight Committee during the design development phase.

