Challenges in Adapting Historic Buildings for New Science Teaching and Research

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Projects of this type should address the following four key considerations:

1. **Understand Structural Limitations**
   - Laser scans of existing structure to substantiate existing documentation
   - Floor-level change diagrams to understand accessibility issues
   - Floor-to-floor height diagrams illustrating clear floor heights

2. **Remove, Replace, and Repurpose**
   - Frequent, obsolete portions of a building will need to be selectively removed to accommodate new uses
   - Met the flexible clear-span requirements of modern classrooms and provided a new accessible and researcher offices, and meeting current code requirements for exit stairs and discharge
   - Challenges range from achieving ADA compliance and providing accessible routes, locating hallways and corridors to allow adequate space for adjacent program, right-sizing faculty

3. **Address Building Envelope Deficiencies**
   - Condensation problems on cool interior surfaces (e.g., HVAC diffusers, chilled beams, water conditioning that causes condensation on surfaces not previously exposed to moisture.
   - One particularly problematic area to watch out for is at leaky exterior walls and windows, allowing air changes, large exhaust needs, and with high electrical demands.

4. **Integrate Highly Sustainable Building Systems**
   - Address air changes and humidification, rather than primarily meeting heating and cooling demands.
   - Decouple heating and cooling loads to deliver air and services close to the point of use. Avoiding large shafts, deep ductwork, and long duct runs can increase energy efficiency and best practices.
   - Implement heat recovery systems to leverage the efficiency and capacity of campus district systems.
   - Maximize use of district utilities and best practices.
   - Use occupancy sensors to reduce waste energy loss from the ventilation system through use of "smart" building controls.

5. **Maximize daylighting**
   - Maximize the use of daylighting and space for natural light.
   - Laser scans of existing structure to substantiate existing documentation
   - Floor-level change diagrams to understand accessibility issues
   - Floor-to-floor height diagrams illustrating clear floor heights

6. **Integrating Highly Sustainable Building Systems**
   - Remove, replace, repurpose
   - Address building envelope deficiencies
   - Understand structural limitations
   - Maximize daylighting
   - Integrate highly sustainable building systems

**Space Removed**
- 80 PSF
- 50 PSF

**Existing Obsolete**
- 60 PSF
- 50% RH

**Space Inserted**
- 100 PSF
- 60 PSF

**FREEZE LINE**
- -11F

**SURFACE TEMP**
- 72F AT 50% RH
- 50% RH