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Building Tour



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**Rhode Island
Energy™**
a PPL company




**Energy code
technical support**



STEPHEN TURNER INC.
Building Better Performance

If You Could See Us Now



More PPL videos: <https://www.provlib.org/about-us/publications-videos/>

Guest Speaker

Angela Touni

Business Development Analyst



RHODE ISLAND
INFRASTRUCTURE BANK

Photo courtesy of designLAB architects

Commercial Property Assessed Clean Energy: Financing Energy Upgrades



RHODE ISLAND
INFRASTRUCTURE BANK

December 13, 2022

About the Infrastructure Bank

Centralized hub of
local infrastructure
investment in Rhode
Island

Our mission is to support and finance investments in the State's infrastructure. We do so through a variety of means, including the issuance of bonds, the making of loans and grants, and the engagement with and mobilization of sources of public and private capital. Through its activities the Bank fosters infrastructure improvements that enhance the environment, create jobs, and promote economic development.



What is C-PACE? A Solution for Commercial Borrowers

- **Commercial Property Assessed Clean Energy (C-PACE)** provides long-term, fixed-rated financing for building upgrades in commercial, industrial, and multifamily (5 or more units) property
- Repay the financing through an assessment on the property (similar to a water or sewer assessment)
- Energy cost savings typically outweigh the payment, enabling a cash-flow-positive project

C-PACE Value Proposition



IMMEDIATE CASH FLOW

- ✓ 100% financing
- ✓ Long payback period, fixed rate, no-balloon
- ✓ Covers all hard and soft costs



FLEXIBLE AND SECURE FOR OWNERS

- ✓ No personal or corporate guarantee
- ✓ Transfers on sale
- ✓ Preserves borrowing capacity



MOST PROJECTS & BUILDINGS QUALIFY

- ✓ Qualify based on property value
- ✓ Funds most energy and water projects
- ✓ All standard commercial property types

What is eligible for C-PACE financing?

New Construction • Rehab/Retrofit • Refinancing Completed Projects

- LED lighting
- Automated building systems and controls
- Renewable energy and solar
- Health & Safety Measures
- Efficient chillers and boilers
- Energy storage systems
- Water conservation
- Building envelope
- Building management systems
- Resiliency
- Associated costs of construction
 - Roof improvements
 - Legal and engineering fees



C-PACE for Every Industry

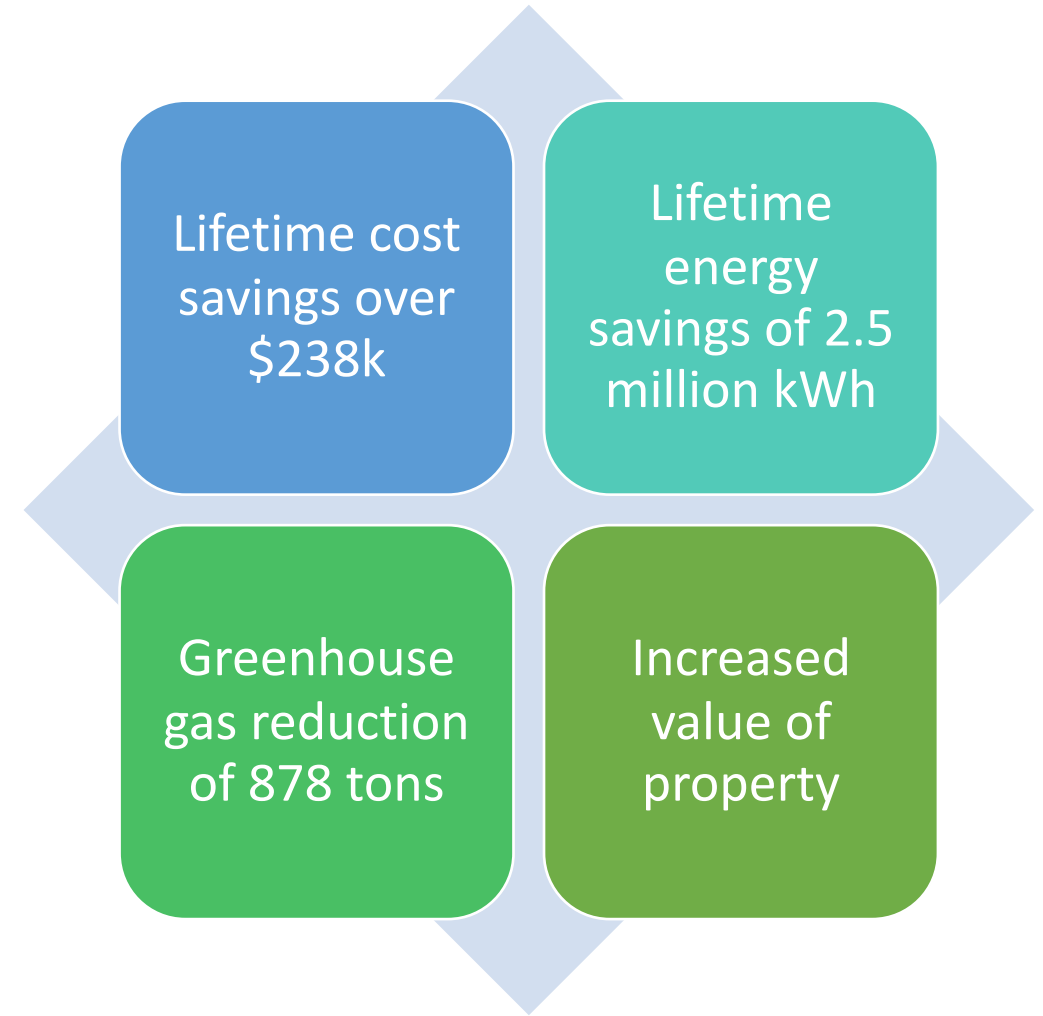
- Libraries
- Medical Facilities
- Retail
- Hospitality
- Manufacturing
- Childcare Facilities
- Office Buildings
- Golf Courses

- Self-Storage Facilities
- Multifamily Housing Units



C-PACE Project: Providence Public Library

- \$1.5MM C-PACE Loan
 - 20-Year, Fixed-rate
- Energy efficient windows and building envelope upgrades
- New efficient HVAC units and energy recovery





Guest Speaker

Michael Doty

Director Energy Efficiency Lending

nuveen
GREEN CAPITAL

Photo courtesy of designLAB architects

Nuveen Green Capital Introduction

Nuveen Green Capital is a national leader in sustainable commercial real estate financing solutions and an affiliate of Nuveen, the investment manager of TIAA responsible for \$1.2 trillion in assets under management as of September 30, 2021. Established in 2015 by the C-PACE industry's founders and standard-setters, Nuveen Green Capital is a private capital provider dedicated to making sustainability a smart financial decision for commercial real estate owners who seek to improve the energy, water and resiliency performance of their property.



Presenter

Nate Taylor

ACP, CxA+BE, LEED AP

Project Manager



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Code Compliance Enhancement Initiative

- Free Energy Code Technical Support is available by calling **1-855-343-0105**
- The Rhode Island Energy Code Technical Support Initiative aims to:
 - Improve energy conservation code compliance through educating code officials and industry professionals
 - Establish higher compliance by offering a competitive stretch code
 - Take on an active role in the policy and advocacy of matters related to energy code

Disclaimer

These trainings are being offered through the support of Rhode Island Energy, and in cooperation with the Rhode Island Building Code Commission. The Energy Code Technical Support staffs are not code officials, and the information provided through the program is not a formal interpretation of the code. Your local code official is responsible for the enforcement of the code and the Rhode Island Building Code Commission is the governing body responsible for interpretations of the code.

Learning Objectives:

Learning Objective 1

To provide project insights to audience with an interest in library facilities

Learning Objective 2

Learn the project history of this largest library renovation in Rhode Island

Learning Objective 3

Review related current energy codes, conceptual building envelope performance, and high performance MEP systems

Current Commercial Code Versions

- SBC-8 RI State Energy Conservation Code
 - SBC-8-2021, adopted in 2022, references the 2018 IECC with RI Amendments
 - RI review of 2021 IECC for adoption is underway
- 2017 RI Stretch Code for Commercial Construction
- This project was built to meet the requirements of the State Energy Code (SBC-8-2013), which references the 2012 IECC with RI Amendments.

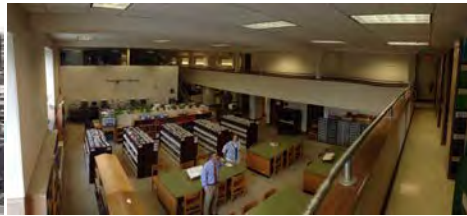
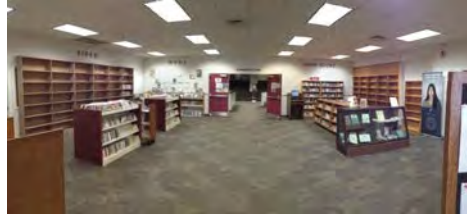




1900
Original Building



1954
Empire Street
Addition



1988
Renovation



2012
Restorations



2020
THINK AGAIN
Transformation

The Evolution of PPL

A low-angle, upward-looking photograph of the Providence Public Library building. The image captures the grand staircase leading to the entrance, which is framed by a large, ornate stone archway. The building's facade is made of light-colored stone and features multiple levels of arched windows. A tall flagpole with a flag is visible on the left side of the building. In the background, a modern glass skyscraper is partially visible. The sky is a pale blue.

Rhode Island's largest ever public library renovation

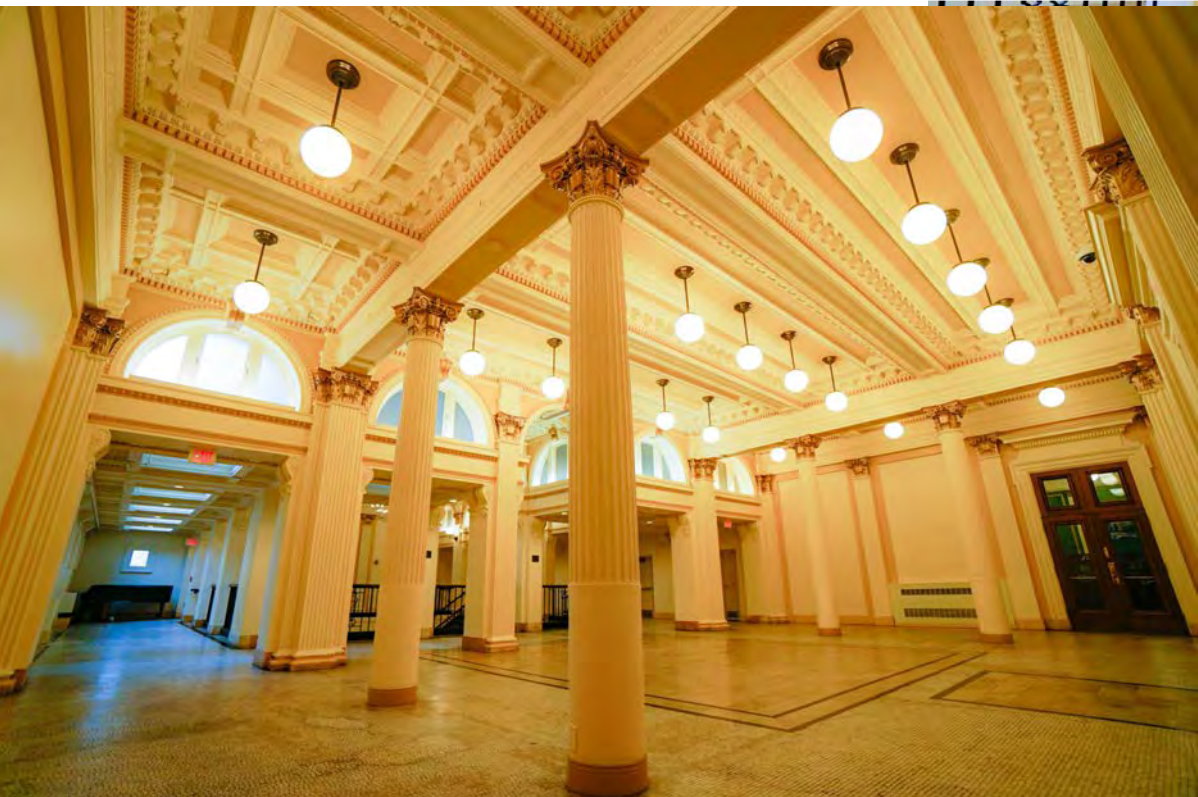
**1900 Original Building
Washington Street Entrance**



Entry Hall (old entrance from the Washington Street)



Grand Hall



150 Empire Street, Downtown Providence





Project Background

Client:	Providence Public Library
Location:	150 Empire Street, Providence, RI
Use:	Public Library
Size:	85,000 S.F.
Completion:	March 2020
Energy Code Version:	RI Energy Conservation Code SBC-8 2013 (IECC 2012)
Architects	designLAB architects
Engineers of Record:	RFS Engineering
General Contractor:	Bond Building Construction
Commissioning:	Stephen Turner Inc.
Award:	2020 AIA Rhode Island Architecture of Rehabilitation Merit Award

Solutions to Challenges

Utilized laser scanning technology to accurately confirm existing conditions and provide a level of certainty regarding MEP modifications

Devised detail mitigation plans and protocols to ensure safe conditions

Multi-phased approach allowed renovations to be constructed without disrupting library activities

Worked with PPL and design team to develop a detailed schedule for preconstruction & construction to prepare the building for modifications

Implemented Lean construction practices that minimized disturbances to pedestrian and vehicular traffic by activating “Just-In-Time” delivery strategies to get materials to the project when they were needed

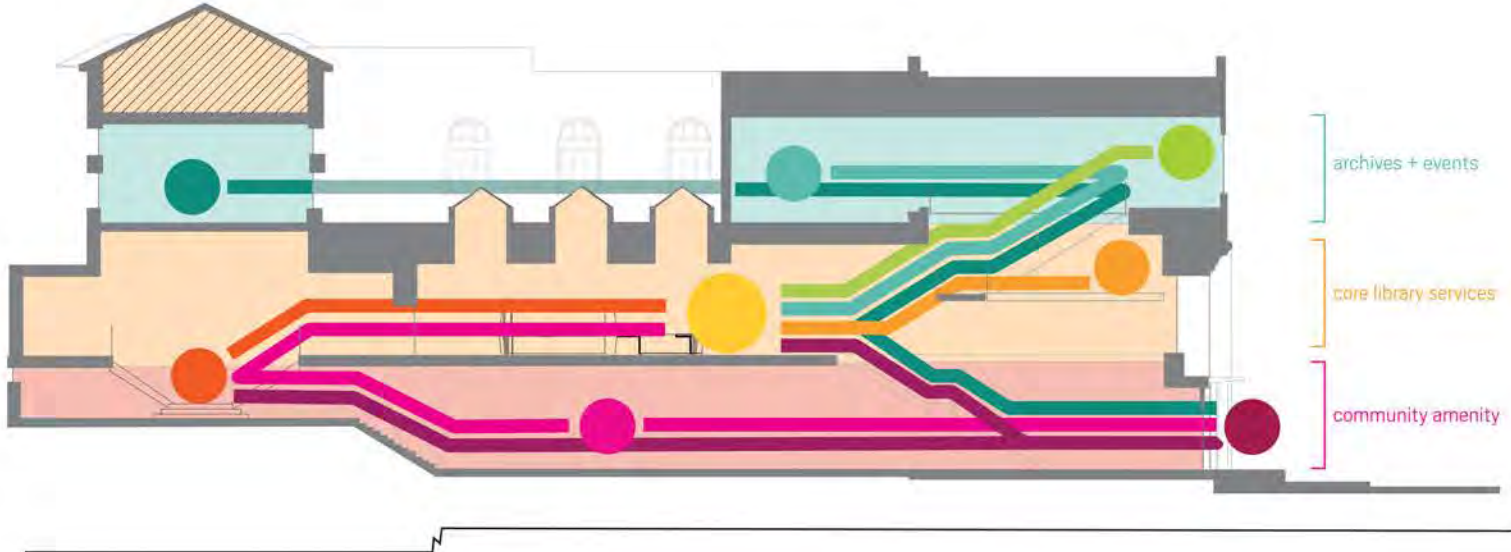
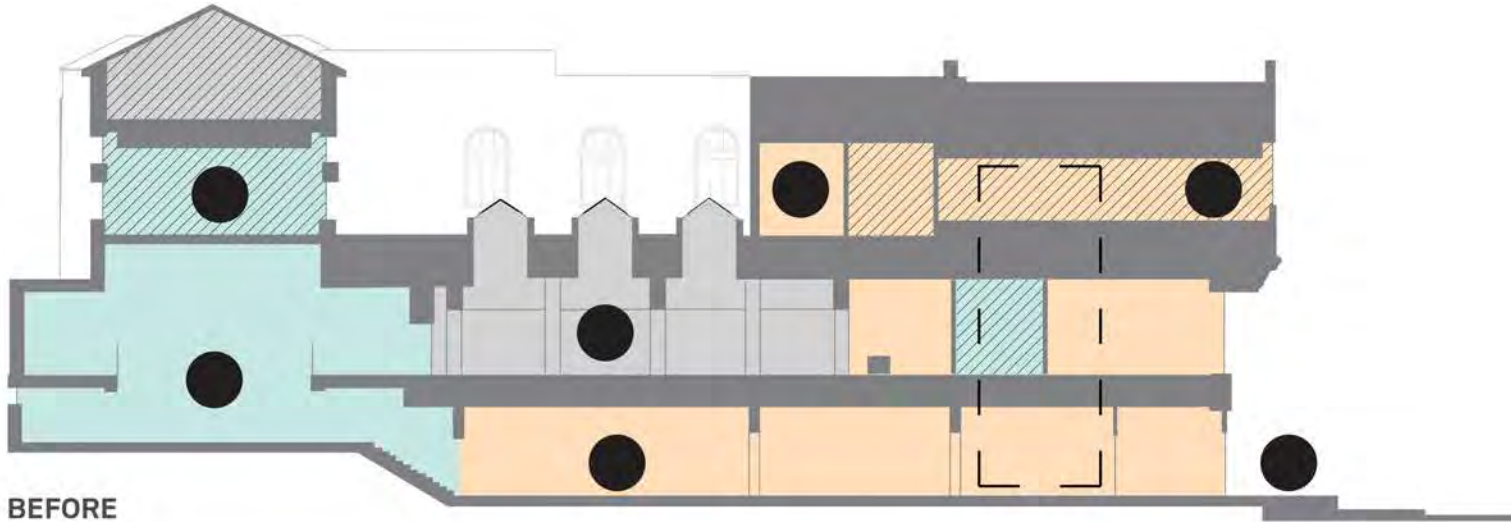
Major Design Interventions



Photo courtesy of Providence Public Library

Design Intervention 1

- community amenity
- core library services
- archives + events
- staff only
- unprogrammed area



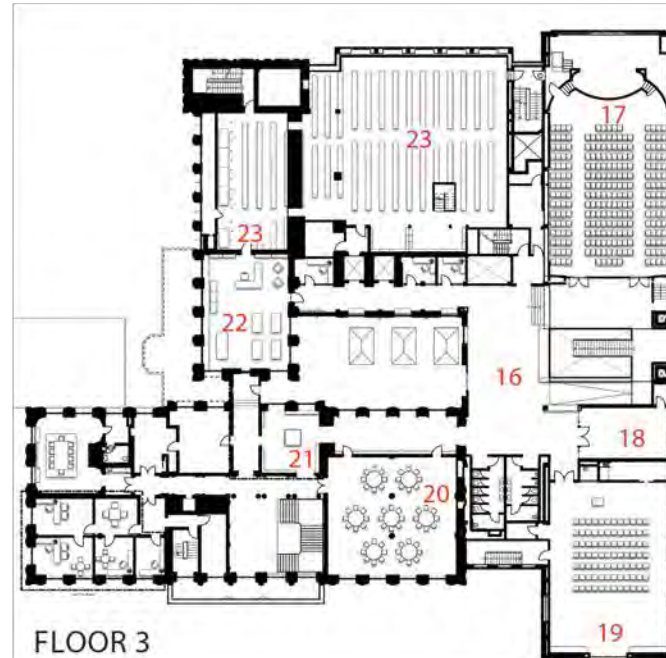
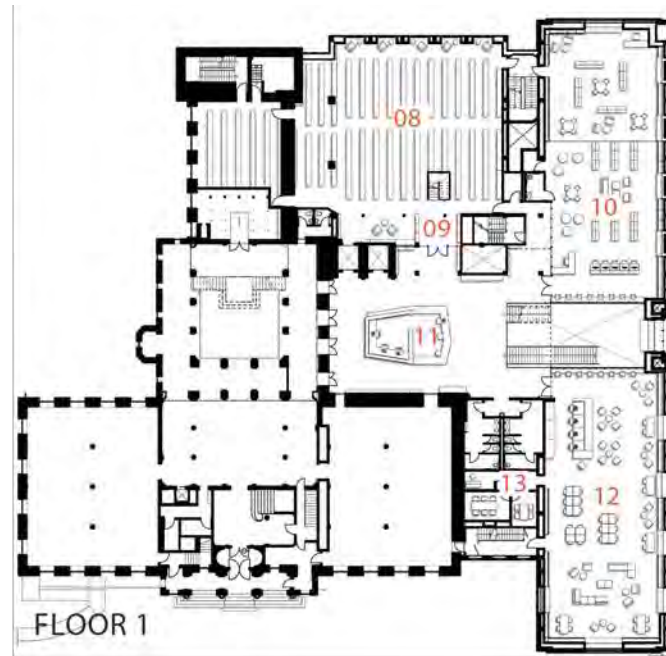
AFTER 1900 1950

Image courtesy of designLAB architects

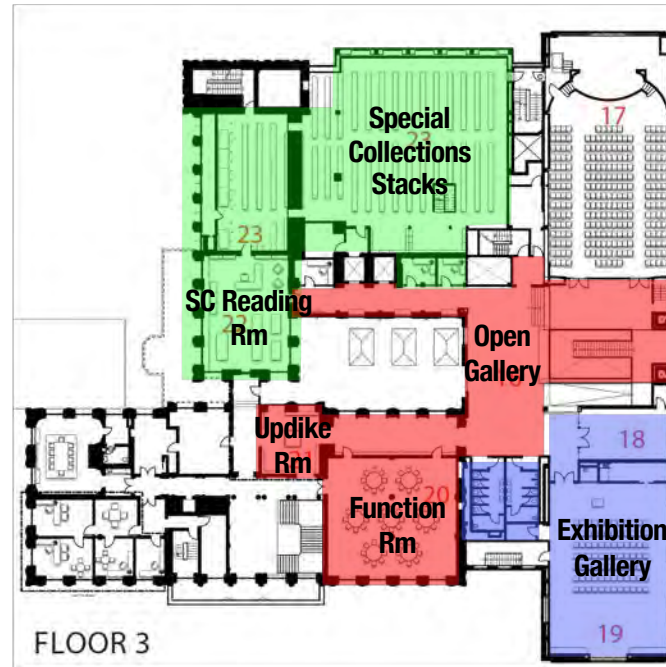
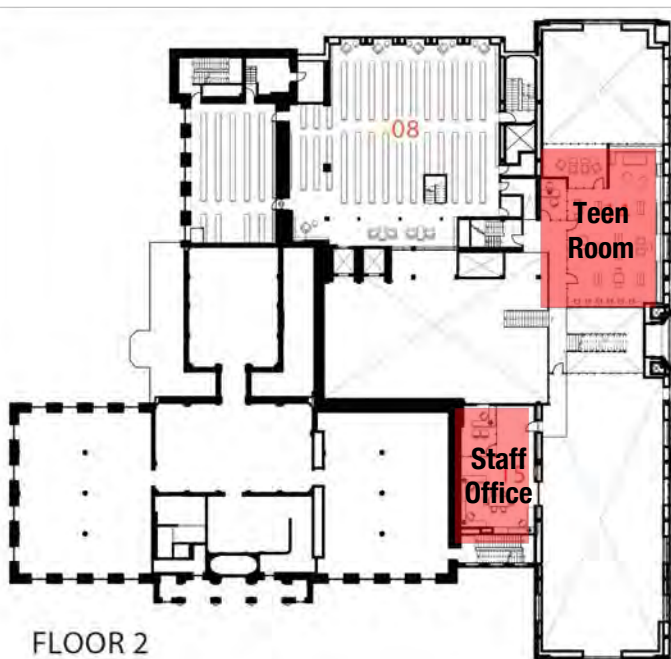
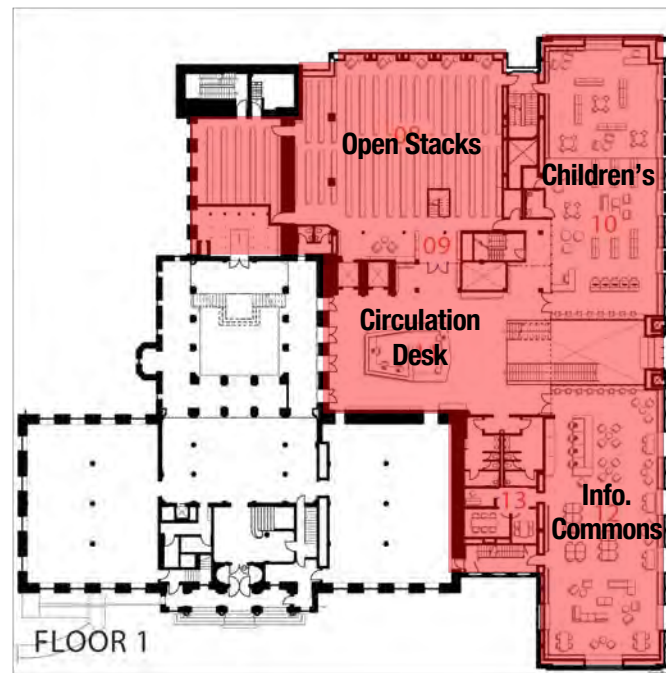
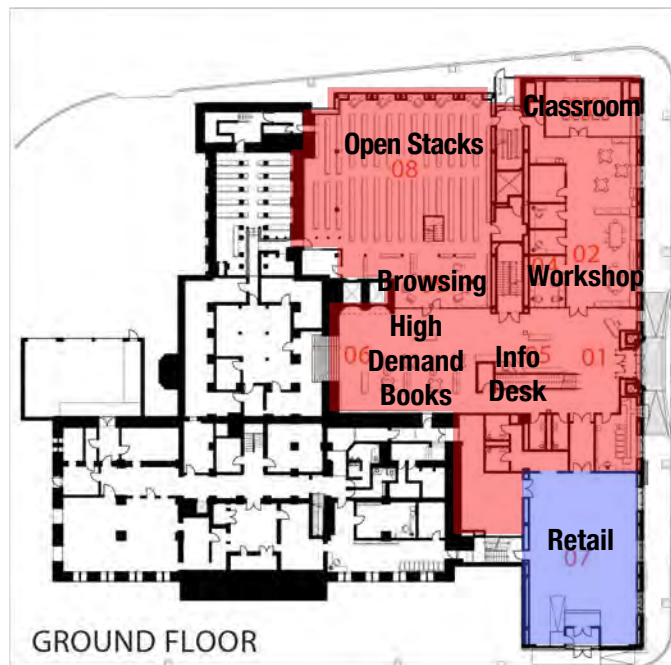
Design Intervention 2



Program Spaces



- 01 main entry
- 02 workshop/maker space
- 03 classroom
- 04 offices
- 05 information desk
- 06 high demand books
- 07 retail space
- 08 open stack
- 09 browsing
- 10 children's library
- 11 circulation desk
- 12 reference & info commons
- 13 meeting rooms
- 14 teen room
- 15 staff offices
- 16 lobby/prefunction gallery
- 17 auditorium
- 18 exhibition gallery
- 19 flex room
- 20 function room*
- 21 updikey room/arcade*
- 22 special collections reading room
- 23 special collections stacks*



Building Systems for the Renovation Spaces

- Renovation HVAC scope including new terminal devices and ventilation upgrades
- New HVAC systems required due to change of space function
- New Critical Environment HVAC systems with redundant units & on emergency power

Existing Building Systems – Heating Systems



The existing primary central hydronic heating systems are located in the mechanical sub-basement and include:

- two 2000 MBH high-efficiency gas-fired boilers
- two 380 gpm pumps with VFDs & piping that generate and distribute heating hot water on an outdoor air reset schedule up to a maximum of 180°

Heating hot water is circulated throughout the building to heating system components; air handling unit heating coils, fan coil units, reheat coils, perimeter radiation, & unit heaters

Existing Building Systems – Cooling Systems



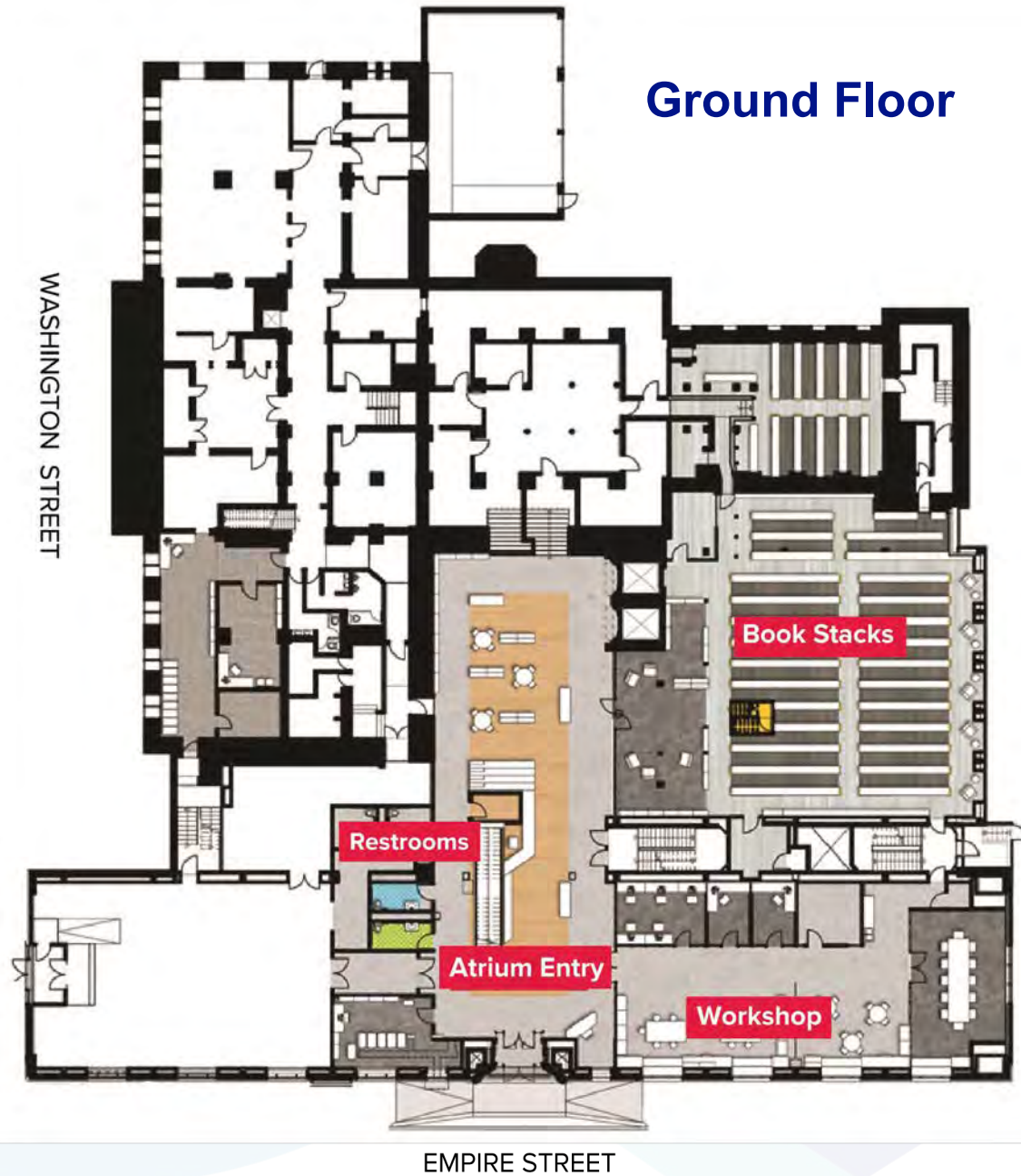
The existing primary cooling system consists of a 100-ton rooftop air-cooled chiller, two chilled water pumps & associated piping

New Building Systems Overview – Air Distribution

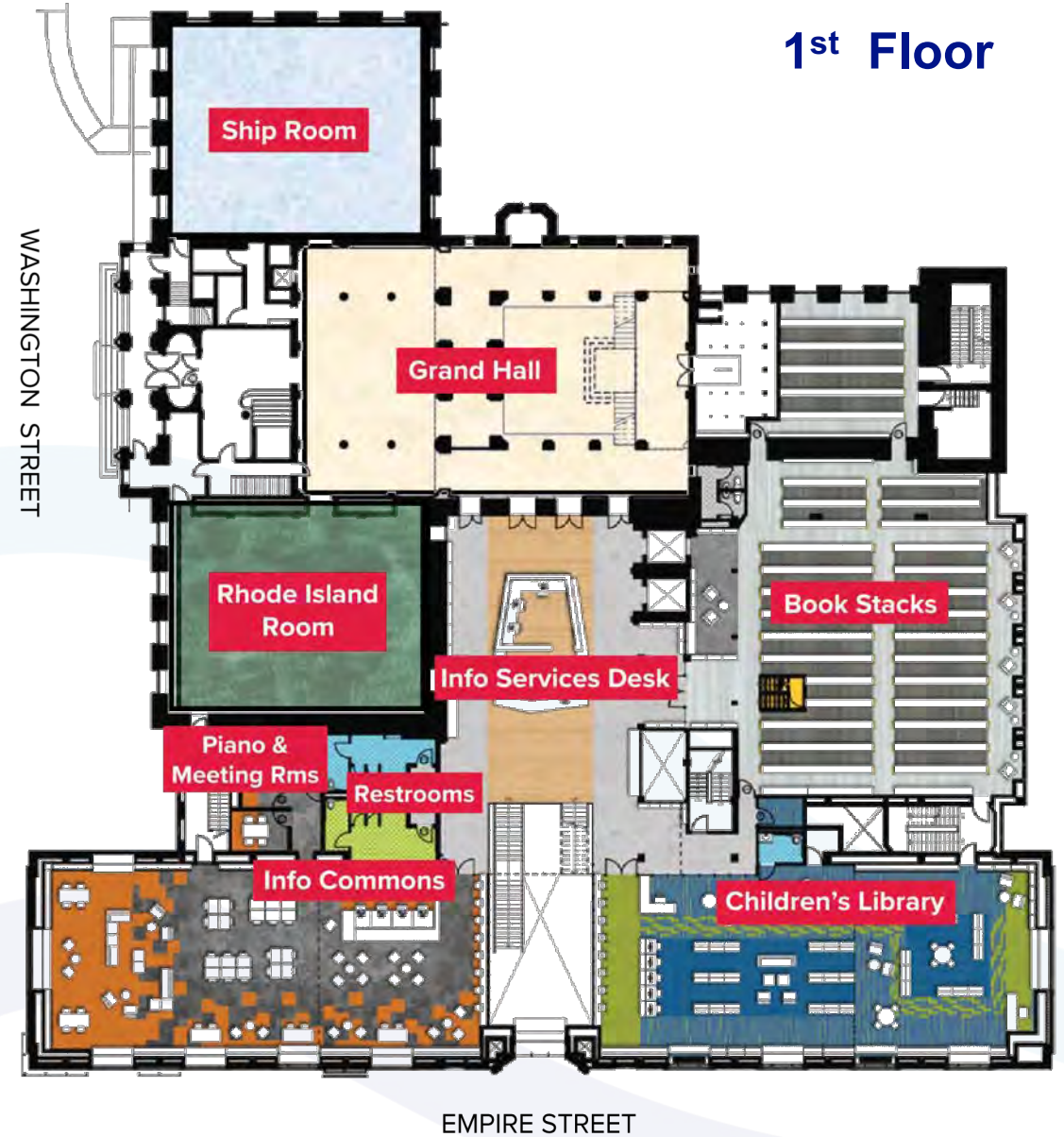
- Five new packaged roof-mounted energy recovery air handling units were installed to provide outdoor air to the renovated spaces
- Auditorium are provided with dedicated units to allow for zone control
- The stacks and support spaces are served by variable air volume boxes
- Trim control of space heating and cooling is provided by fan coil units
- A smoke exhaust and make-up air system was installed to serve the new atrium
- *Some existing air handling units located in the basement remain*



Ground Floor

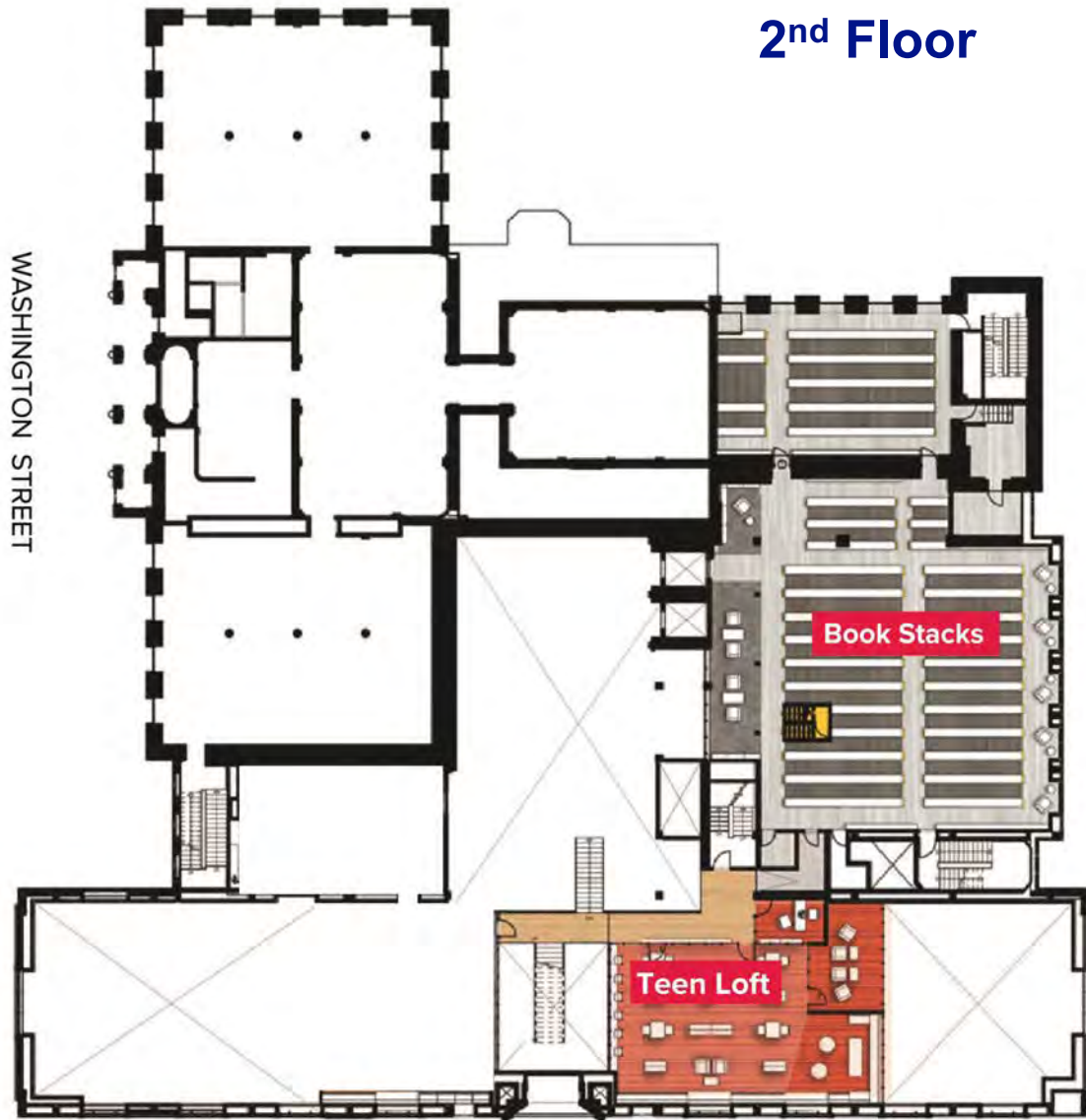


1st Floor



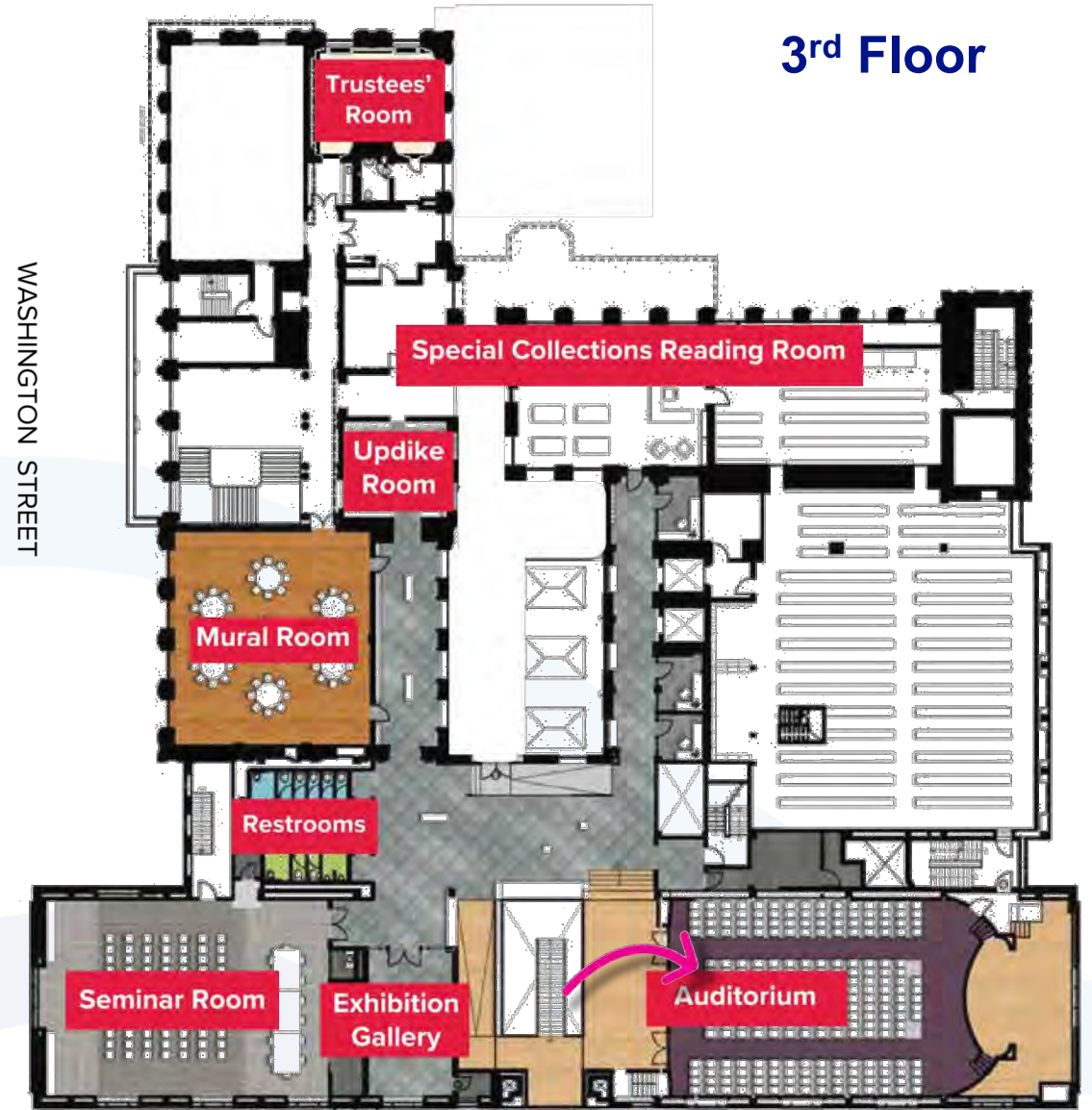
Images courtesy of Providence Public Library. <https://www.provlib.org/visit-us/library-maps/>

2nd Floor



EMPIRE STREET

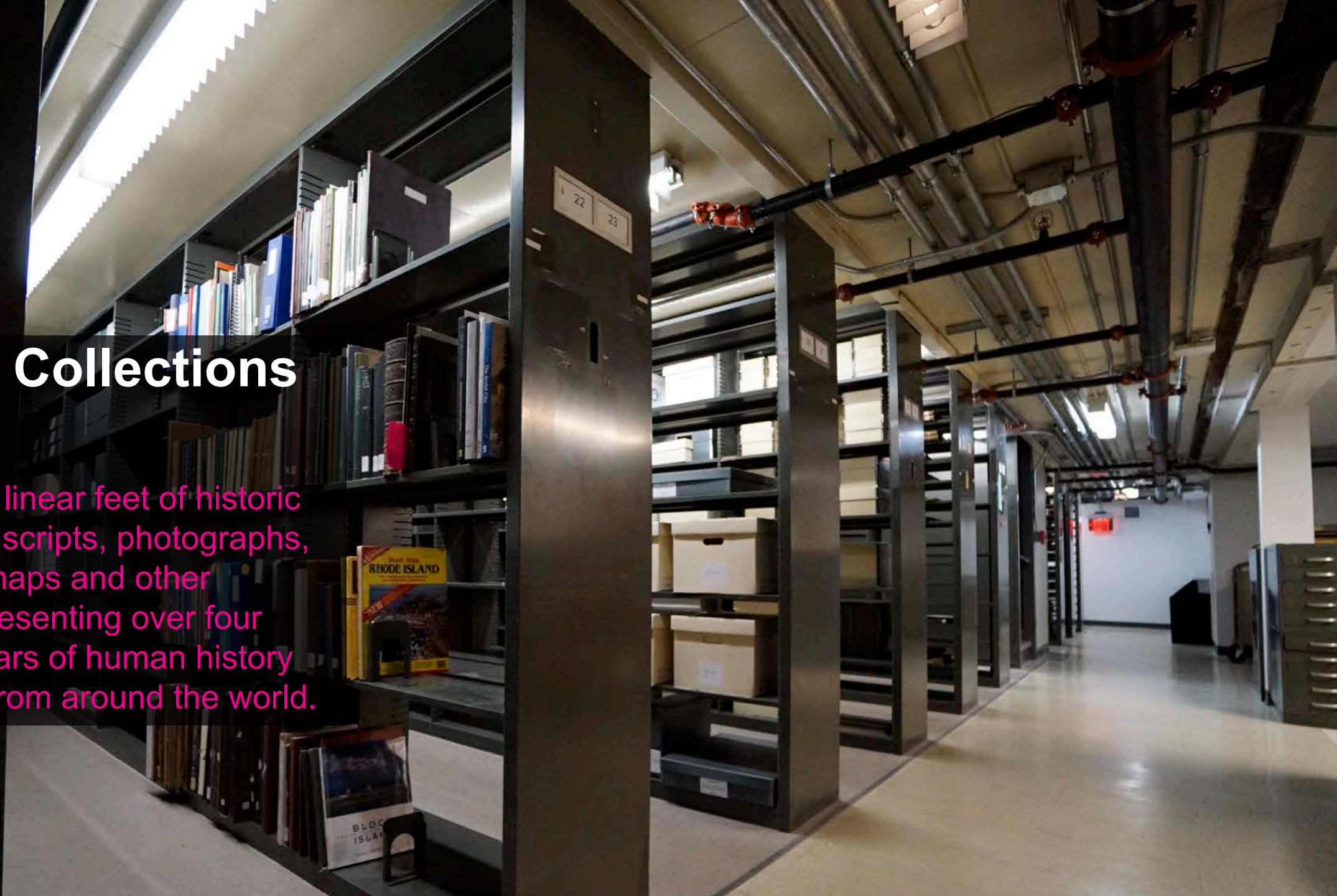
3rd Floor



EMPIRE STREET

Special Collections

Over 10,000 linear feet of historic books, manuscripts, photographs, ephemera, maps and other artifacts representing over four thousand years of human history and culture from around the world.



Special Collections – Reading Room

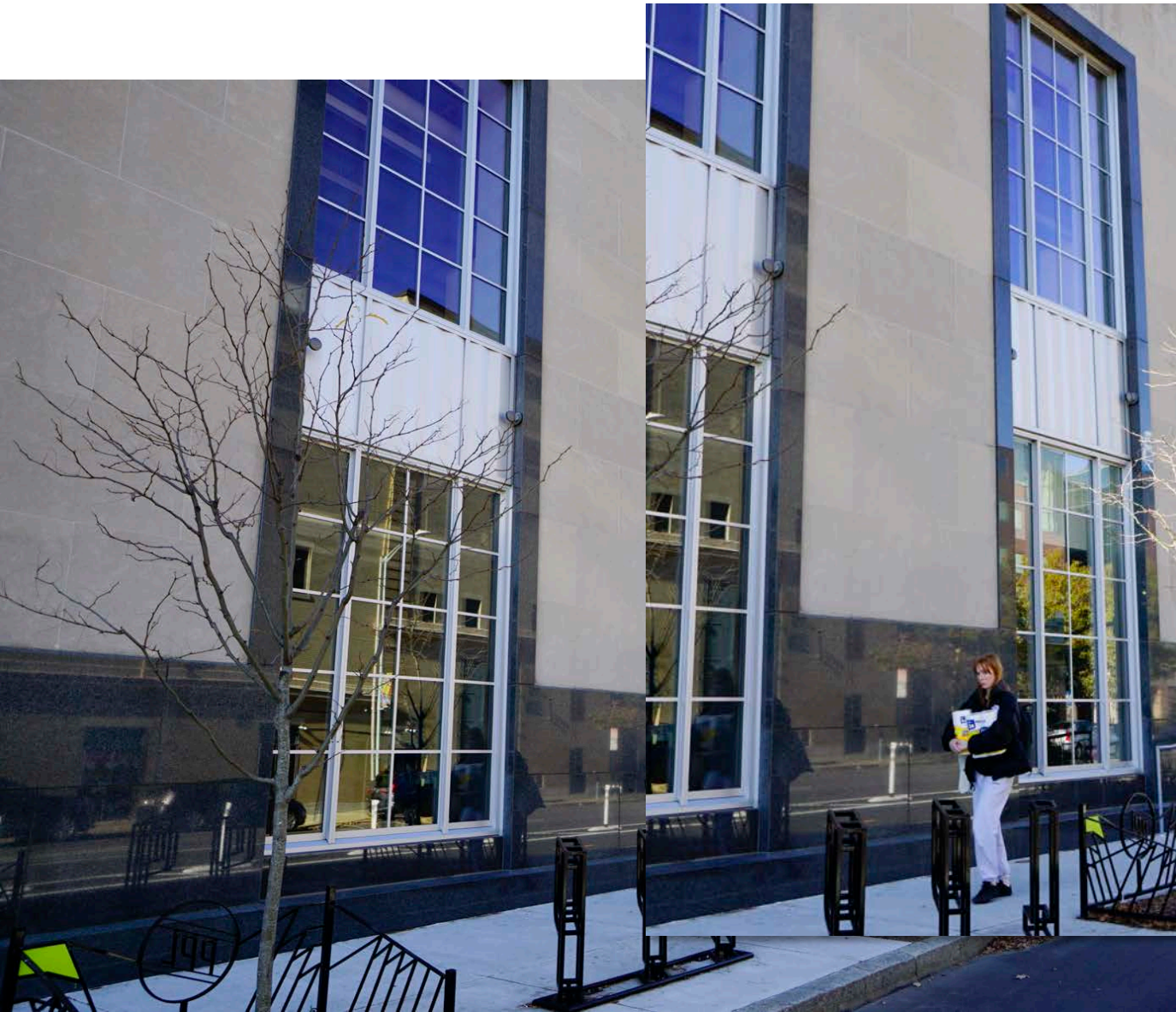


Building Envelope



1st Floor Circulation Desk

Building Envelope





Building Envelope

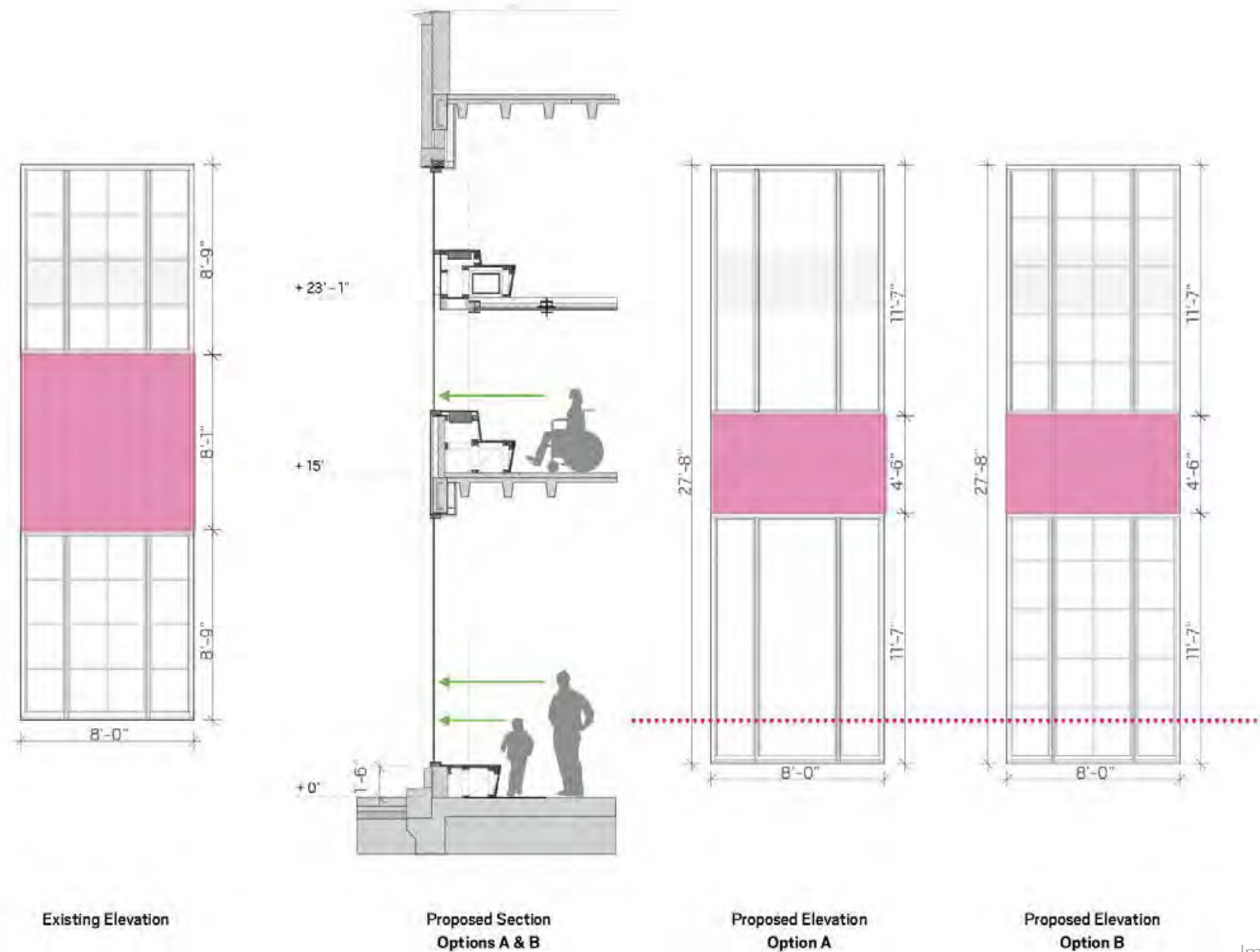
“The 1954 addition, however, ignores the original scale and texture of the building and attempts by sitting, to hide the original structure.”

“[The].... addition effectively became the main building, hiding as much as possible the original building, viewed by the new designers as an embarrassing, frumpy bustle.”

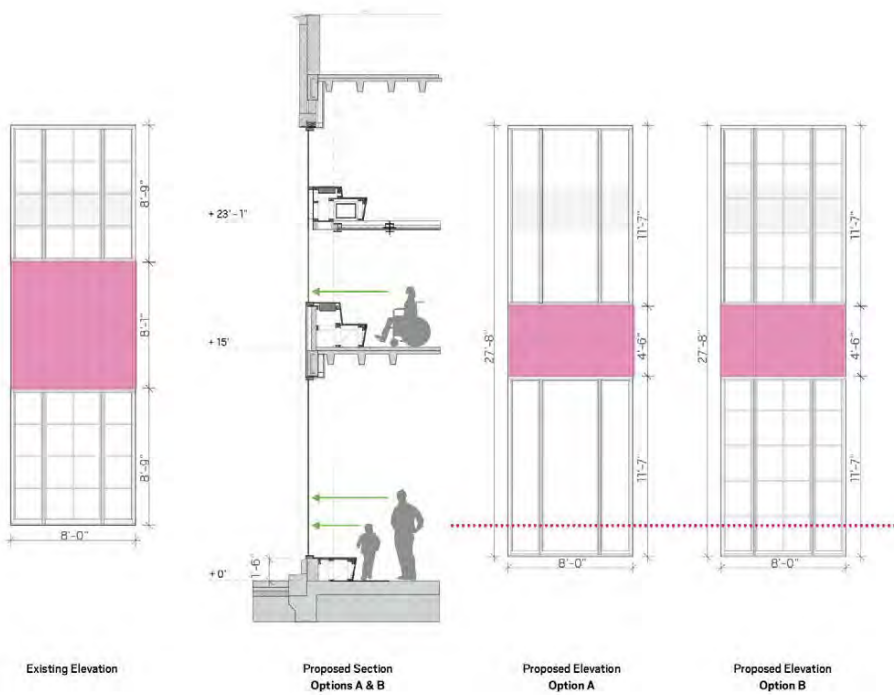


Images courtesy of designLAB architects

Building Envelope



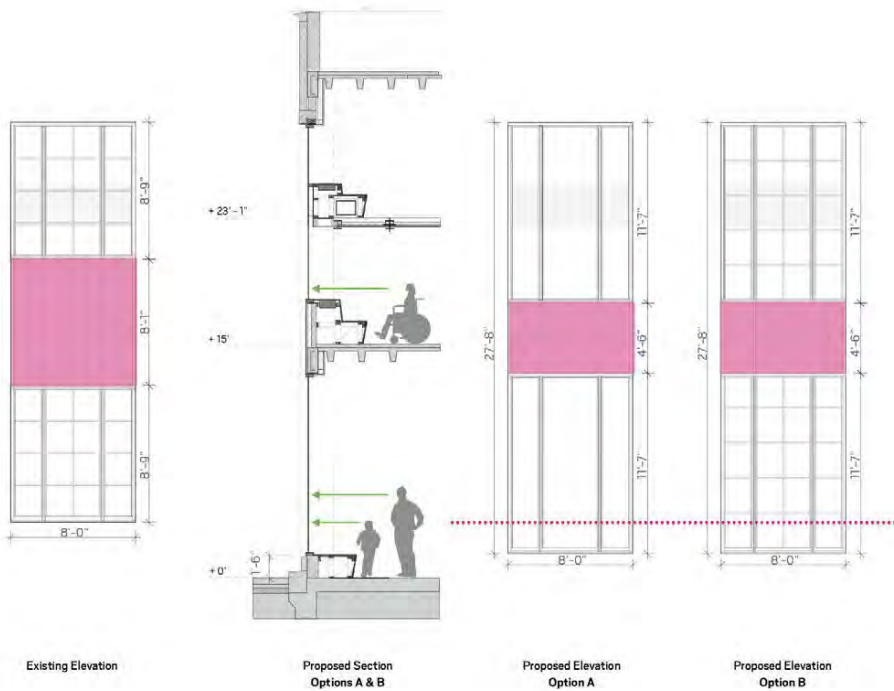
Building Envelope



Images courtesy of designLAB architects



Building Envelope



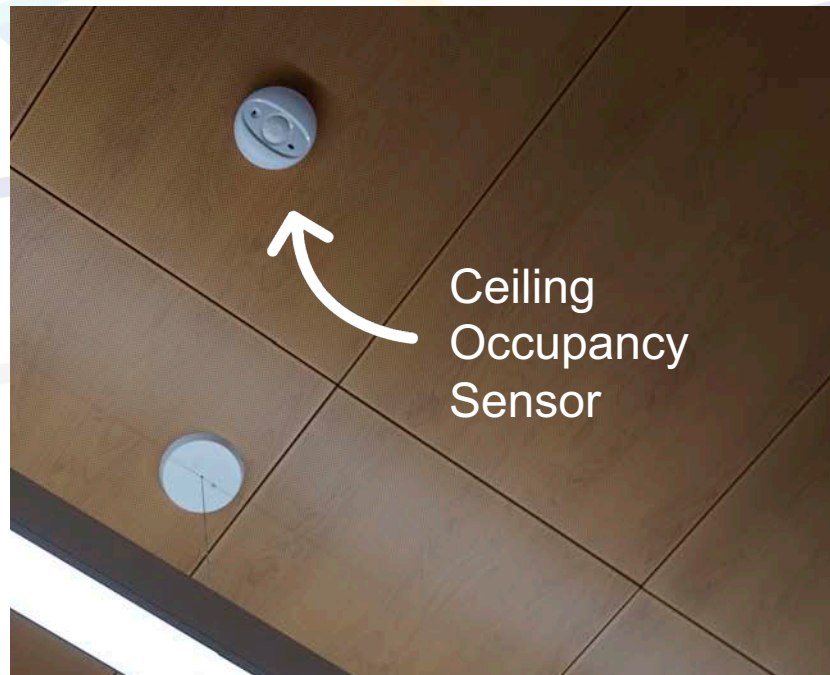
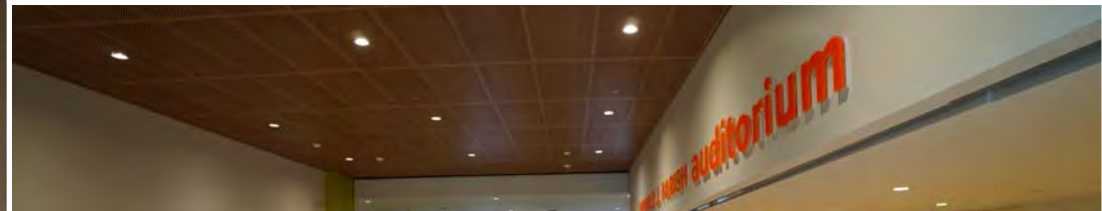
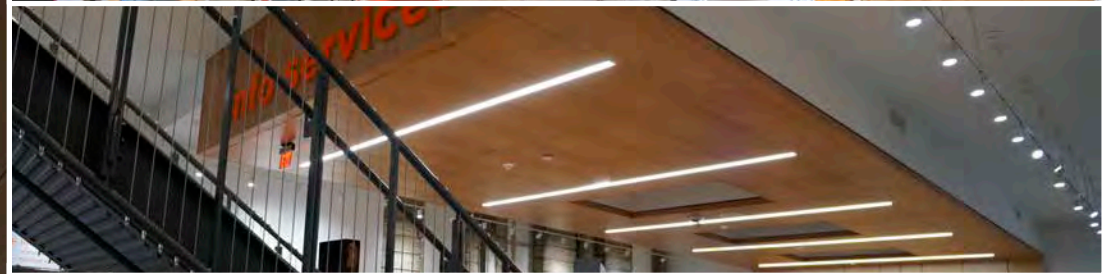
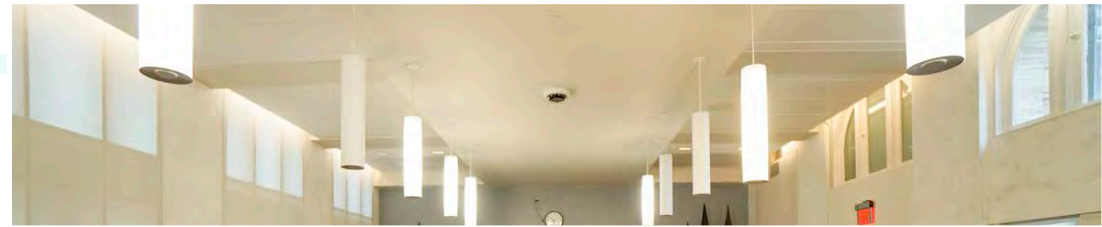
Images courtesy of designLAB architects



View through Empire Street window to the Workshop

Lighting & Lighting Controls

- All new LED lighting throughout self supporting stacks were installed, which had a payback of under 2 years
- A wireless automatic lighting control system was installed



Energy Code Compliance

This project was built to meet the requirements of the State Energy Code (SBC-8-2013), which references the 2012 version of the International Energy Conservation Code (2012 IECC) with RI Amendments.

Utility Incentives

- National Grid (now Rhode Island Energy) incentives were pursued for lighting in the stacks. The incentives allowed the library to install 450 LED luminaires, replacing 900 fluorescent lights.
- The project also received \$1.6 million through the Rhode Island Commercial Property Assessed Clean Energy (RI C-PACE) program. Under the C-PACE program, the projected energy savings over the loan term from measures such as increased window R-values and improved HVAC equipment efficiencies must exceed the total loan value. The library thus anticipates over \$1.6 million in energy savings over the life of the loan.

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- BOND Building Construction. *Providence Public Library Renovation.* <https://bond-building.com/project/providence-public-library-renovation/>



Questions?