



Re-use, Retrofit & Renew(able)

The Three Green R's for Resuscitating and Renewing Existing Buildings

March 12, 2008

Building Energy 2008 Conference, Boston

Presented by:

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Re-use, Retrofit & Renew(able)



➤ Successful Integration

- Set early goals and mindset
- Owner/Design team buy in
- Early feasibility studies and life cycle cost analysis
- Use experienced consultants
- Start early to seek incentives

Within Mills Restoration/Renovation Project



- Mixed Use
- 36,724 SF
- Cost: \$9.8 Million
 - Donation program
 - Utility Incentives
 - MTC Renewable energy grants



- Community based: “The non-polluting non-profit”
- Off-grid project goal

Within Mills Restoration/Renovation Project



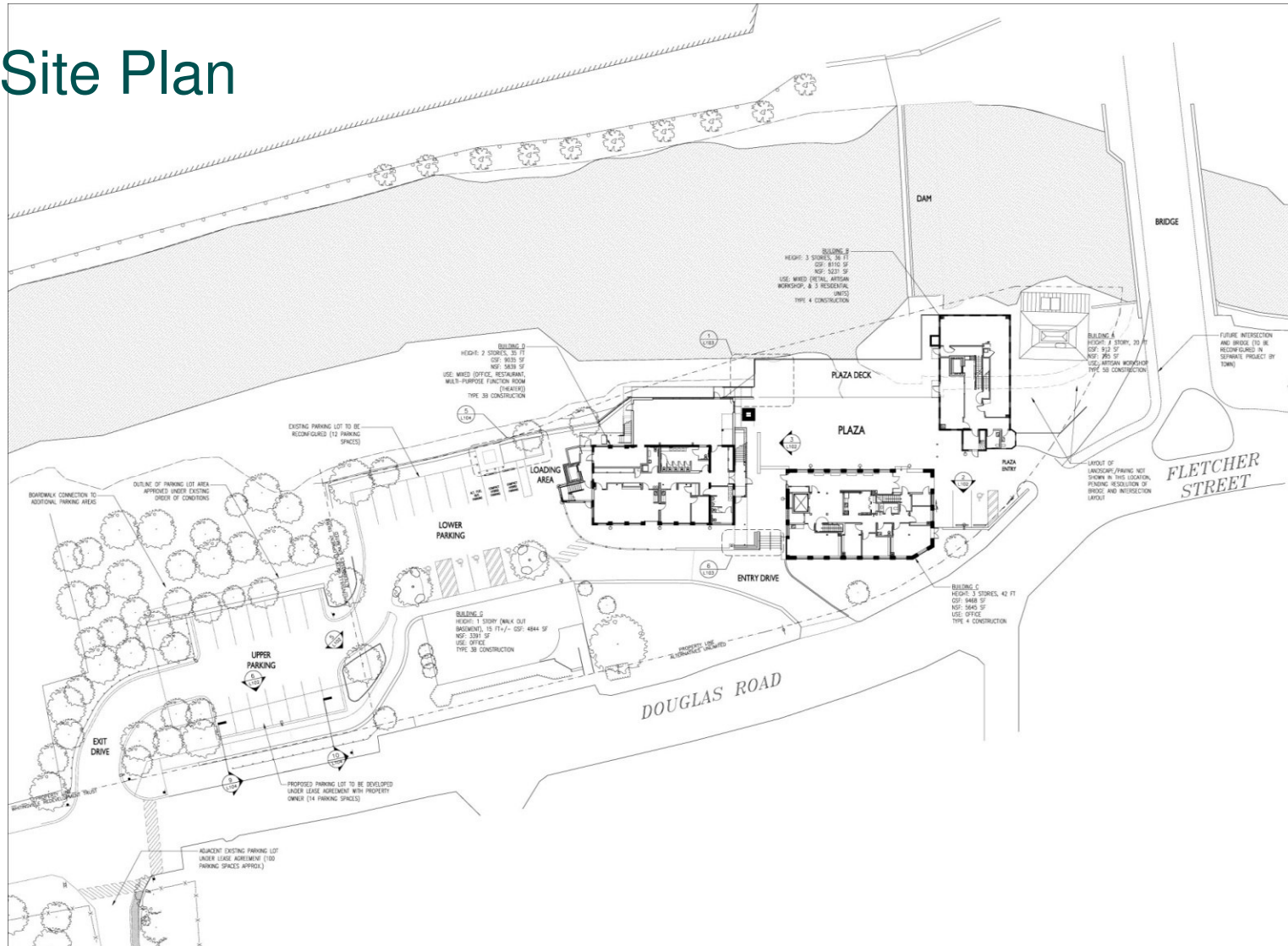
➤ Site Overview

- Building A: The Forge Museum - 1776 forge/cotton mill
- Building B: Artist Studio and Apartments - 1826 Brick Mill
- Building C: Administrative Offices - 1905
- Building D: Performing Arts Facility - 1920 Brick Mill
- Building E: Restaurant - 1920 Brick Mill
- Riverfront Plaza Re-development: 1970's building demolished

Within Mills Restoration/Renovation Project



Site Plan



AUSTIN ARCHITECTS

CLIENT:
 ALTERNATIVES UNLIMITED, INC
 54 Douglas Road
 Whitinville MA 01586
 508-234-6252

ARCHITECT:
 AUSTIN ARCHITECTS, LLC
 38 Cameron Avenue
 Cambridge MA 02140
 617-441-8500

STRUCTURAL ENGINEER:
 POLYV BURL ROBERTS & ASSOCIATES
 2150 Washington Street
 Newton MA 02452
 617-557-9600

CIVIL ENGINEER:
 BEALS AND THOMAS, INC
 144 Turnpike Road
 Southborough MA 01772
 508-388-0560

METALS ENGINEER:
 BUILDING ENGINEERING RESOURCES
 23 Main Street, Building 2A
 North Easton MA 02556
 508-230-0280

MECHANICAL ENGINEER:
 HERITAGE DESIGN GROUP
 One Main Street
 Whitinville MA 01586
 508-288-2019

MECHANICAL ENGINEER:
 PAUL CRONKA SPECIFICATIONS, LLC
 108 Hayden Row Street
 Hingham MA 01978
 609-665-1198

LANDSCAPE ARCHITECT:
 ZAPOTEC ENERGY
 28 Glenwood Avenue
 Cambridge MA 02138
 617-868-1864

CONSTRUCTION DOCUMENTS - ISSUED FOR BIDDING

NO. DESCRIPTION DATE

WHITIN MILL REDEVELOPMENT

NORTH KEY PLAN

SITE PLAN

PROJECT NO: 04038
 SCALE: 1" = 20'-0"
 DATE: 02 FEBRUARY 2008

DRAWING NO:
L100

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Within Mills Restoration/Renovation Project



➤ Energy Conservation Measures

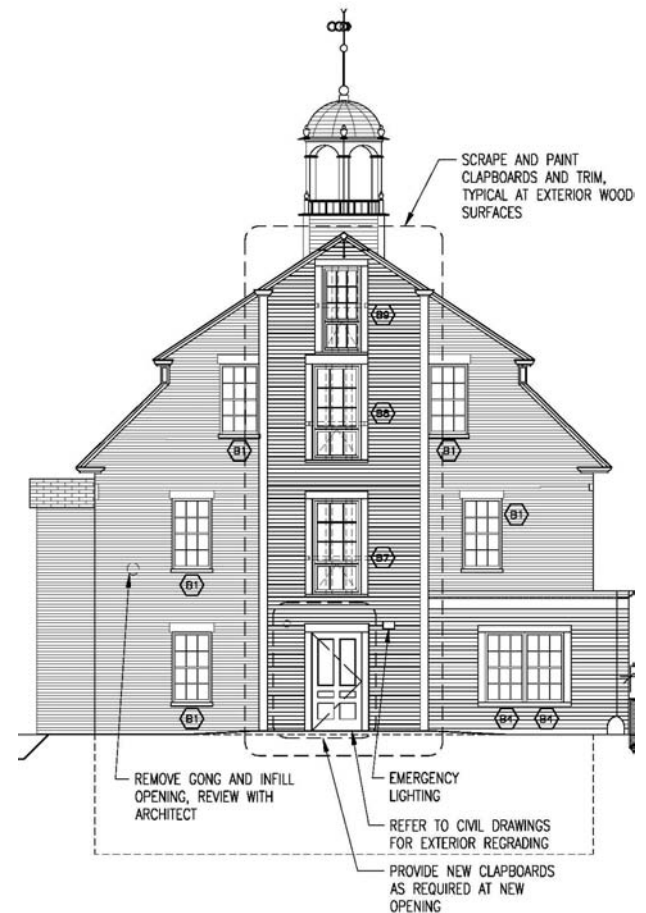
- High Efficiency Lighting
- Geothermal Heating and Cooling system: 100% (HVAC)
- Renewable Energy
 - Restored Hydro-Electric Dam facility:
 - 80% of electricity
 - 9 kW Photovoltaic system
 - Research on blacktop energy harvesting program

Within Mills Restoration/Renovation Project



➤ Limitations

- High Performance Building envelope
- Existing Conditions
- Glazing
- Historical Commission Requirements



Source: Austin Architects

Within Mills Restoration/Renovation Project



➤ Energy Conservation Measures

- High Efficiency Lighting: 5% reduction
 - Reduced LDP
 - Lighting controls
- Mechanical: 43% reduction
 - Geothermal Heating and Cooling system
 - Heat Recovery
 - Demand ventilation Control

Total Energy Conservation Measures: 48% above Code

Within Mills Restoration/Renovation Project



➤ Renewable Energy Systems

- Hydro Electric: 330,000 kWh/yr
- 9 kW Solar PV installed

➤ Renewable Energy Incentives from MTC

- Hydro Pre-development and permitting: \$ 344,000
- PV system: small renewables grant \$ 43,200
- Feasibility Study- pavement heat harvest: \$ 33,759
- **Total Grants: \$ 420,959**

Within Mills Restoration/Renovation Project



➤ Other Sustainable Features

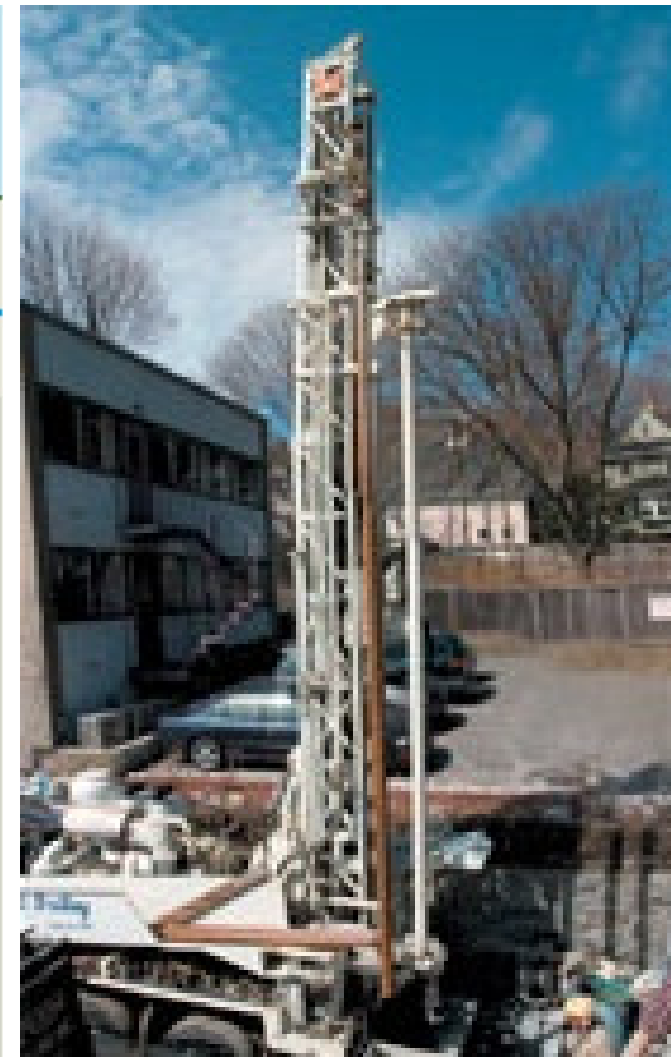
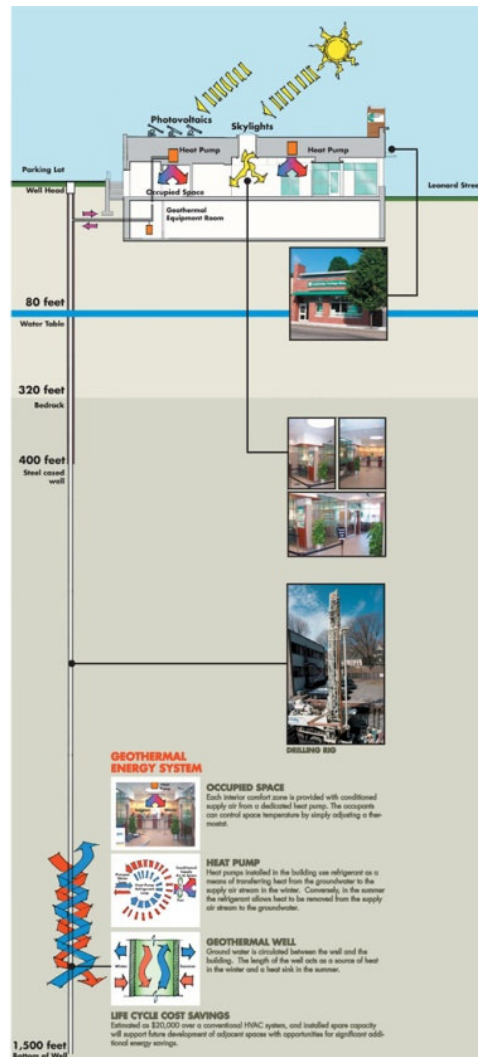
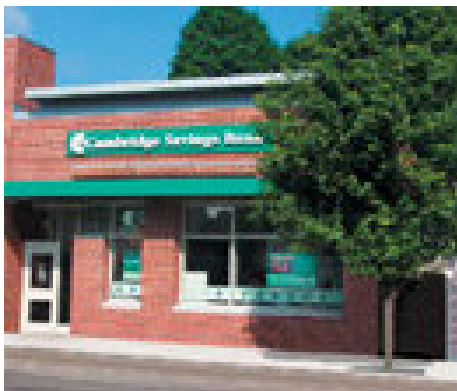
- Recycled Lumber
- Used 2 Tulip Trees from the site

Cambridge Savings Bank



➤ Belmont Branch

- 2004 renovation
- Geothermal Heating and Cooling
- Energy Efficiency
 - Skylights
 - Efficient Lighting and lighting controls



Cambridge Savings Bank



➤ Newton Branch

- 2 kW Photovoltaic Array
- Photovoltaic panels

➤ Other Branches

- Future green vegetated roof on 2 branches
- Urban wind turbines

