Belmont Citizens Forum

Vol. 9, No. 3 A Newsletter for Belmont Residents May/June 2008

Homeowners Can Opt for Solar, Wind Power

By Meg Muckenhoupt

A few decades ago, home solar and wind power were the province of ranchers, cabin-dwelling paranoiacs, and hippies living in yurts. Now, technological advances and state and federal tax credits have made home-based energy accessible to homeowners with more conventional dwellings and attitudes. Home solar electricity, solar hot-water systems, and wind turbines are all in use in greater Boston, and more are being installed every day.

These systems aren't appropriate for every house. Most homeowners can reduce their energy bills more quickly and efficiently by conserving energy—by adding insulation, reducing hot-water use, installing programmable thermostats, and repairing and replacing leaky doors and windows, among other ways. Still, in these times of uncertain oil supplies and increasing prices, the lure of energy independence can be strong.

How Alternative Energy Works

Homeowners can collect solar energy in two main ways: with photovoltaic cells and with hot-water heaters. Photovoltaic (PV) cells are semiconductors. When sunlight hits a cell, the solar energy pushes electrons away from atoms, creating an electrical current. The amount of energy produced depends on the amount of sunlight: so, cloudier days generate less electricity. PV cells are usually mounted in rows on panels that produce anywhere from 10 to 300 watts; multiple panels are combined to make kilowatt installations.

Despite our northerly location, Massachusetts is considered a good location for PV cells. According to the National Renewable Energy Laboratory, a "flat plate" collector tilted to collect the maximum possible sunlight in Massachusetts will capture 3–4 kilowatt-hours (kWh) per square meter per day. The average Massachusetts household uses an average of 21 kWh of electricity per day, according to the U.S. Energy Information Administration; a 350 square foot (32 square meter) rooftop PV array would supply half that household's electricity, according to calculators at findsolar.com.

Solar hot-water heaters, the other main solar-power option for homeowners, usually consist of tubes filled with water or—to thwart New England's icy nights—a heat-transfer liquid that cannot freeze. The tubes may sit in a dark box, or they may be painted black and directly exposed to the sun. Pumps or a siphon system bring the hot liquid from the roof down to the house and push cool liquid back up again.

As for wind systems, they capture the wind's energy by using the motion of spinning rotor blades to drive an electric generator. Most turbines have a

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In This Issue

Environmental Events Calendar

Lady Slippers and other Wildflowers. Friday, May 30, 6:30–8:30 p.m. It's May in Massachusetts, and pink lady slippers are in flower. Come to Habitat to enjoy and learn about these beautiful orchids and other late spring wildflowers that are in bloom. Fee $12 Massachusetts Audubon members, $15 non-members. Registration required. Habitat Education Center and Wildlife Sanctuary, 10 Juniper Road, Belmont, (617) 489-5050, habitat@massaudubon.org. www.massaudubon.org/Nature_Connection/Sanctuaries/Habitat.

West Lexington Greenway South Walk. Saturday, May 31, 9–11:30 a.m. Explore the southern end of the West Lexington Greenway on this walk through Lexington Conservation's Cranberry Hill and adjacent property within the City of Cambridge's watershed. Look for expansive views, beautiful woodland and extensive stone foundations. Meet at the far end of the parking lot for the One Cranberry Hill Office park adjacent to the entrance of Minuteman Regional High School, 758 Marrett Road, Lexington. Citizens for Lexington Conservation, Mike Tabaczynski, (781) 929-8748. www.lexingtonma.org/clc/HomePage.htm.

WCES Annual Meeting and Potluck Dinner. Sunday, June 1, 5:30–8:30 p.m. Watertown Citizens for Environmental Safety hosts Professor Bill Clark, who will address global environmental challenges to local communities. St. John's United Methodist Church, Mt. Auburn St, Watertown. (617) 926-8560, mail@watertowncitizens.org. www.watertowncitizens.org.

Censoring Science. Sunday, June 1, 7:30 p.m. NASA scientist Dr. James Hansen and author Mark Bowen will speak about the pressing need to reduce greenhouse gas emissions. Hansen's efforts to speak openly about the importance of reducing greenhouse gases was impeded by political appointees at NASA. This program is part of a speaker series offered by the Lexington Global Warming Action Committee. Cary Memorial Hall, 1605 Massachusetts Ave, Lexington. www.lexgwac.org/JamesHansen.html

Sustainable Belmont Meetings. Wednesday, June 4 and Wednesday, July 2, 7–9 p.m. Join Sustainable Belmont to develop ways to help Belmont become an environmentally responsible town. The June 4 meeting features a video and discussion about potential health risks from common products found in homes and personal care products. Flett Room, Belmont Public Library. sustainablebelmont@gmail.com

Wildflowers of the Summer Solstice. Friday, June 20, 6 p.m.–8 p.m. Summer arrives today with the solstice which marks the longest day of the year. Join naturalist Boot Boutwell for a stroll on the sanctuary. We'll welcome in summer when it arrives officially at 7:59 p.m. as the sun is getting ready to set. Suitable for adults and children over 8 years. Fee: $8 Massachusetts Audubon members, $10 non-members. Sponsored by Habitat and New England Wild Flower Society. Registration required. Habitat Education Center and Wildlife Sanctuary, 10 Juniper Road, Belmont, (617) 489-5050, habitat@massaudubon.org.

Belmont Citizens Forum Inc.
is a not-for-profit organization that strives to maintain the small-town atmosphere of Belmont, Massachusetts, by preserving its natural and historical resources, limiting traffic growth, and enhancing pedestrian safety. We do this by keeping residents informed about planning and zoning issues, by participating actively in public hearings, and by organizing forums on key subjects. Our newsletter is published six times a year (January, March, May, July, September, and November). Published material represents the views of the authors and not necessarily those of the Belmont Citizens Forum. Letters to the editor may be sent to P. O. Box 609, Belmont, MA 02478 or to editor@belmontcitizensforum.org

DEP Approves 83,000 Gallon Sewer Permit

By Sue Bass

Though raw sewage continues to back up into Winn Brook basements, belch out through manholes into Belmont streets, and pollute the area's lakes and streams, the Massachusetts Department of Environmental Protection has reaffirmed a sewer permit to add 83,000 gallons a day of additional sewage to the system. A regional director of DEP has now upheld a magistrate's ruling that the permit "sufficiently protects public health and safety."

DEP Criticizes Belmont Water Pollution

The same state agency also continues to criticize Belmont for neglect of its long-standing sewer problems. In January 2000 DEP issued Belmont its first Notice of Noncompliance and Determination of Significant Contributor of Pollution to the Waters of the Commonwealth. Though the town spent several millions of dollars to reduce the pollutants discharged from its broken sewer pipes, last year DEP issued another such notice, requiring extensive further sewer improvements. Based on the extent of the problem, DEP granted Belmont an $11.6 million low-interest loan from a state revolving fund.

In April 2007 and again in 2008, the federal Environmental Protection Agency gave a grade of D to water quality in the Mystic River watershed, into which Belmont's sewage is spilling. Analysts for the Mystic River Watershed Association, which does extensive sampling and testing of water quality throughout the watershed, recently quantified seven years of testing and spotlighted the best and the worst areas for sewage-contaminated water. The two worst spots were not inner city locations but the leafy suburbs: Alewife Brook at Broadway in Arlington and the spot in Belmont where Winns Brook empties into Little Pond.

McLean Hospital applied in October 2005 for a permit to add sewage from two projected developments on its property to the town's sewer system–the 600,000-square-foot Freedom Commons residential community for senior citizens and a 150,000-square-foot research and development complex. Both developments are planned for the hill overlooking Waverley Square. Their utilities, including the sewage pipes, have been built under Olmsted Drive, and a new road has been cut through the McLean open space to Pleasant Street.

BCF Says Belmont Sewers Are Not Fixed

The Belmont Citizens Forum wrote DEP in January 2006 to oppose granting McLean permission to connect to the town's sewer system on the grounds that the mitigation McLean promised would not be adequate. "Belmont homes are still being flooded with raw sewage during heavy storms, and the easy, low-cost improvements are rapidly being exhausted," the Citizens Forum said in its letter to John Zajac, who reviewed McLean's application for the DEP. "Many of the remaining problems are in individual

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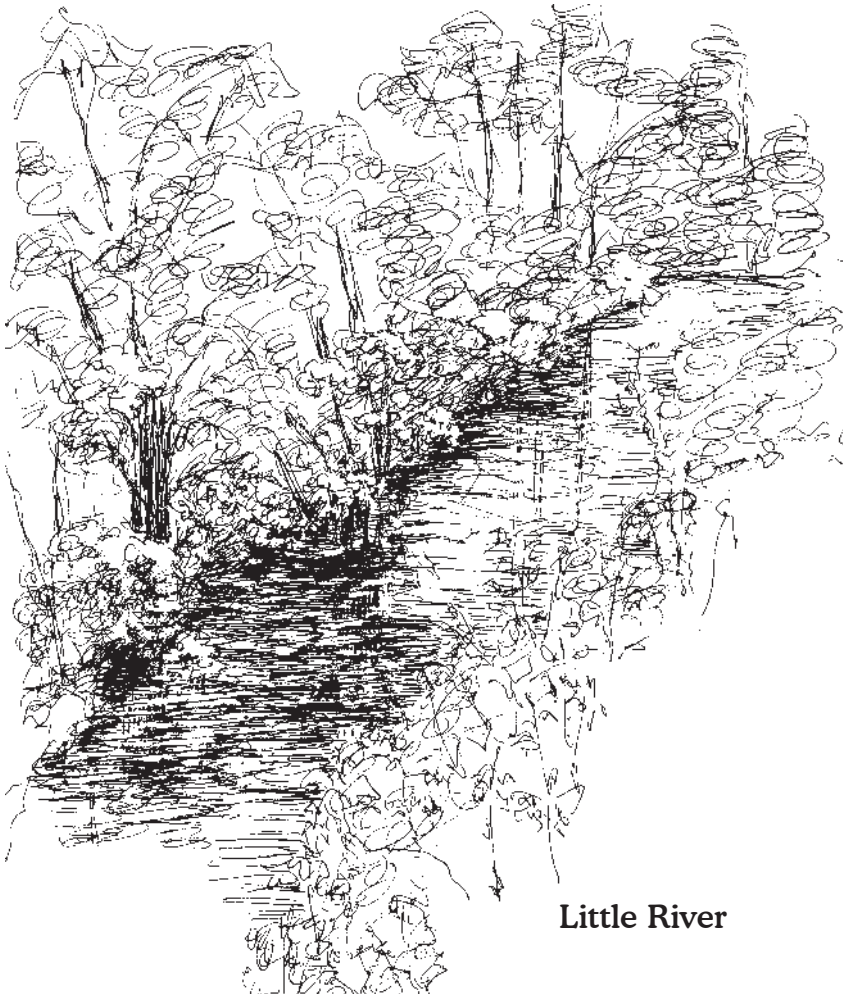


Little River

Sewer Permit *continued from page 3*

homes, problems like foundation drains connected to sanitary sewers. They are expensive to find and fix. Belmont's sewers are not fixed, and the remaining problems will be more expensive to correct than the problems considered when the mitigation agreement was originally negotiated." When the letter was ignored, the Citizens Forum and 12 citizens appealed the permit.

Extensive written testimony was filed to document the extent of the sewage backup problem, the pollution of streams from Belmont's broken sewers, and the inadequacy of the mitigation McLean proposed. On January 29, 2007, Administrative Magistrate Bonney Cashin held a hearing to supplement the written testimony with oral examination of the witnesses. However, the attorneys for Freedom Commons and McLean declined to cross-examine any of the Citizens Forum's witnesses.

Four months later, in May 2007, Cashin recommended in favor of McLean, but the decision was not final until April, when DEP affirmed the recommendation, clearing the way for an appeal to Superior Court. The final decision was signed by Martin Suuberg, regional director for DEP's central office, based in Worcester, after the DEP commissioner, Laurie Burt, recused herself from handling the appeal. Suuberg's brief decision included no explanation for the long delay or for the commissioner's recusal.

— Sue Bass is a director of the Belmont Citizens Forum.

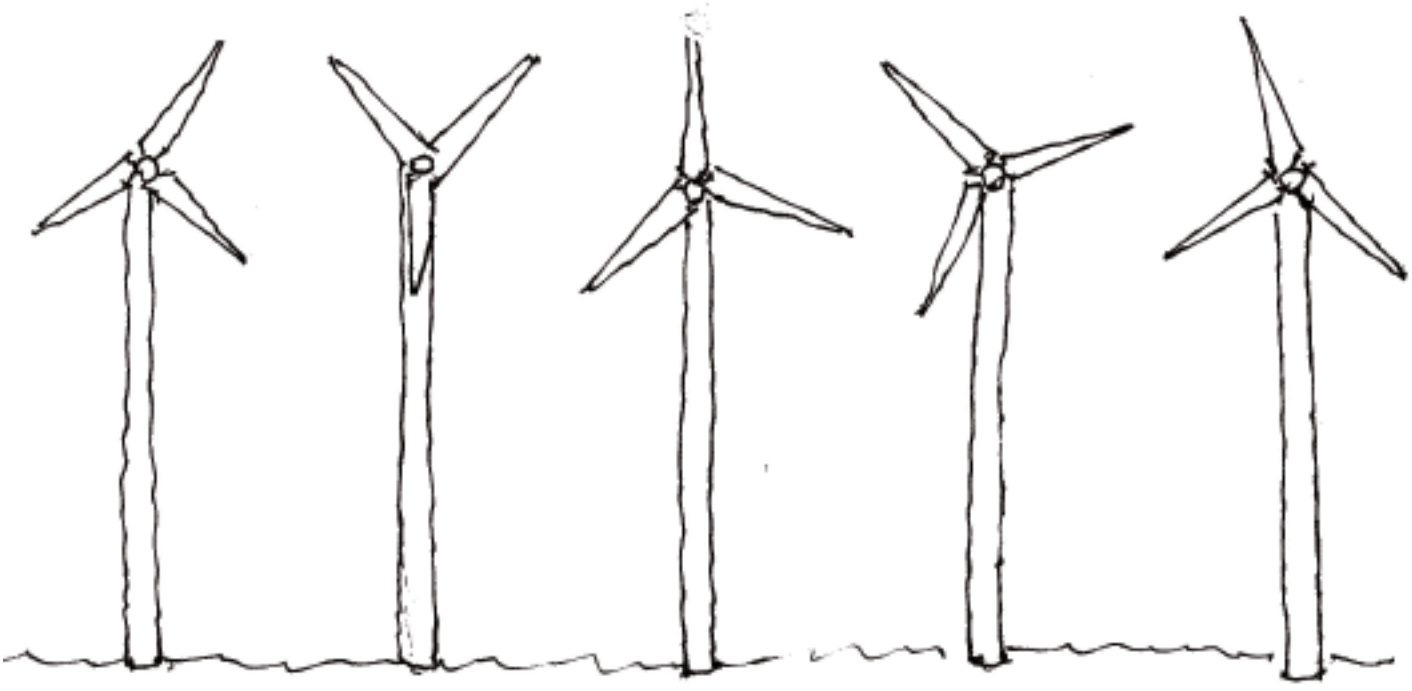
Energy *continued from page 1*

maximum safe speed and automatic shutoffs to keep the rotor from breaking in high winds.

Deciding on Home Energy Systems

Solar systems can work well on any home that has a roof facing within 45 degrees east or west of "true south" (the highest point the sun reaches in the sky during the day). Wind systems are a trickier business. Not only do the turbines need to be located in windy areas, which are generally near the coast or mountaintops, but they also need to be mounted on poles at least 35 feet high, which may violate local building codes. The poles also require guy wires that must extend at least half the height of the pole, which can strain the boundaries of a narrow lot.

Installing a home solar or wind system costs about as much as a mid-priced automobile. But home energy systems pay for themselves, sometimes in as little as 5 to 10 years. According to findsolar.com, home PV systems cost $10 per watt for arrays producing less than two kilowatts and $9 per watt for larger installations. A system that will provide 50 percent of an average Massachusetts family's electric-



ity costs about $31,500 to install, but the net cost will be $23,110 after tax credits and rebates (see below). For that size system, payback time is roughly 10 to 15 years. Solar hot-water systems are cheaper, averaging $3,500 for a system that will provide 80 gallons of hot water a day, the amount typically used by a four-person household. Those systems pay back the investment in 9 years—less if you're heating water with electricity now.

Rebates, Loans Make Renewables Cheaper

"The Patrick administration places a priority on accelerating the number of solar electric photovoltaic projects (PV projects) within the Commonwealth," declares the state's Commonwealth Solar website (www.masstech.org/solar). To show just how important PV projects are, the Commonwealth Solar project is offering $68 million over the next four years for residential, commercial, and public PV installations. Rebates run $2 per watt installed, and residential projects are eligible for rebates for PV systems that generate up to 5 kW. However, homeowners must apply for the rebate before the system is installed. The state has a similar program for wind and hydroelectric systems, but it only distributes $3.6 million a year.

Massachusetts also offers several tax incentives for renewable-energy systems. Homeowners can get a state income-tax credit of up to $1,000 or 14 percent of the net cost of the system, whichever is less. Residential solar, wind, and heat-pump systems are exempt from state sales taxes. Homeowners who are planning for the long term will be happy to learn that any increase in their home's value due to a new renewable-energy system is exempt from local property taxes for 20 years from the date of installation. That isn't as wonderful as having the home's entire value exempt from taxes, but it's a pleasant perk.

Rooftop solar collectors. Source: www.catskillhouse.us

Federal income-tax credits are available for both solar PV and hot-water systems "placed in service" between January 1, 2006 and December 31, 2008. Homeowners can get a credit for 30 percent of the cost of the system, up to $2,000. As of this writing, Congress is still debating whether to extend those credits through 2009.

— Meg Muckenhoupt is Editor of the Belmont Citizens Forum newsletter.

Alternative Energy on the Web

www.energystar.gov The U.S. EPA and Department of Energy's energy conservation program; the site contains information about federal tax credits for renewable energy.
www.eere.energy.gov The U.S. Department of Energy's Energy Efficiency and Renewable Energy site.
masstech.org/cleanenergy/cando/howto.htm Solar-energy installation guides and rebate information from the state-funded Technology Collaborative Renewable Energy Trust.
www.ase.org/section/_audience/consumers/taxcredits Information about federal energy-efficiency tax credits, including credits for insulation, furnaces, and windows.
www.findsolar.com/?page=rightforme&subpage=efficiency Information on ways to make your home more energy-efficient, ranked by payback time and return on investment.

Farmers' Market Opens in Center June 12

The Belmont Farmers' Market third season opens on June 12! Old favorites will return, and new faces will join the Belmont Farmers' Market community this season. Look for specialty vendors to join the Market throughout the season. To get a complete list of vendors and weekly notifications of Market day happenings by signing up at www.belmontfarmersmarket.org.

The Market is run entirely by volunteers with a love of fresh, local food. We are looking for sign adopters, a coupon program coordinator, market managers, special event coordinators, a volunteer coordinator, writers, photographers, and performers. For information contact belmontfarmersmarket@gmail.com.

Thursdays, June 12 – October 30, 2008
2–6:30 pm
Belmont Center Municipal Parking Lot, at Cross St. and Channing Rd.

Look for these early crops in June:

Asparagus
Arugula
Escarole
Fresh-cut flowers
Green onions
Garlic scapes
Honey
Kale
Lettuces
Herbs
Radishes
Raspberries
Rhubarb
Spinach
Sugar snap peas

Image courtesy of Wikimedia Commons, commons.wikimedia.org/wiki/Image:Garlic_scape.jpg.

Garlic Scapes

In early June, farmers' market stalls are often graced with mysterious green curlicues with strange bulbs at their tips. These serpentine stalks are garlic scapes, a stalk with closed flower buds. Farmers snip them off their garlic to compel the plants to put all their efforts into growing tasty bulbs instead of lovely blossoms.

The scapes can be twisted into charming bracelets, but they also have a fresh, spicy garlic taste. Garlic scapes perk up stir-fries and pizzas and can simmer a savor of spring into risotto with wild mushrooms. To appreciate scapes solo, sauté or steam them for 6-8 minutes, adding a splash of balsamic vinegar after cooking, or make savory spreads like garlic scape pesto and ganouj.

Garlic Scape Ganouj

Adapted from www.thegarlicstore.com

2 cups chopped garlic scapes
3/4 cup olive oil
1/2 cup tahini
1/4 tsp salt
juice of 1 medium lemon

Mix all ingredients in blender or food processor. Serve as a dip or spread with crackers and raw vegetables.

Garlic Scape Pesto

Adapted from www.thegarlicstore.com

1/2 lb chopped garlic scapes
1 cup olive oil
2 cups grated parmesan or asiago cheese
1 tsp lemon juice (optional)

In blender, puree together scapes and olive oil until smooth, then add parmesan. Taste, and add lemon juice if desired. Enjoy with pasta or as a dip or spread.

Center Bridge Cleaning Requires Private Funds

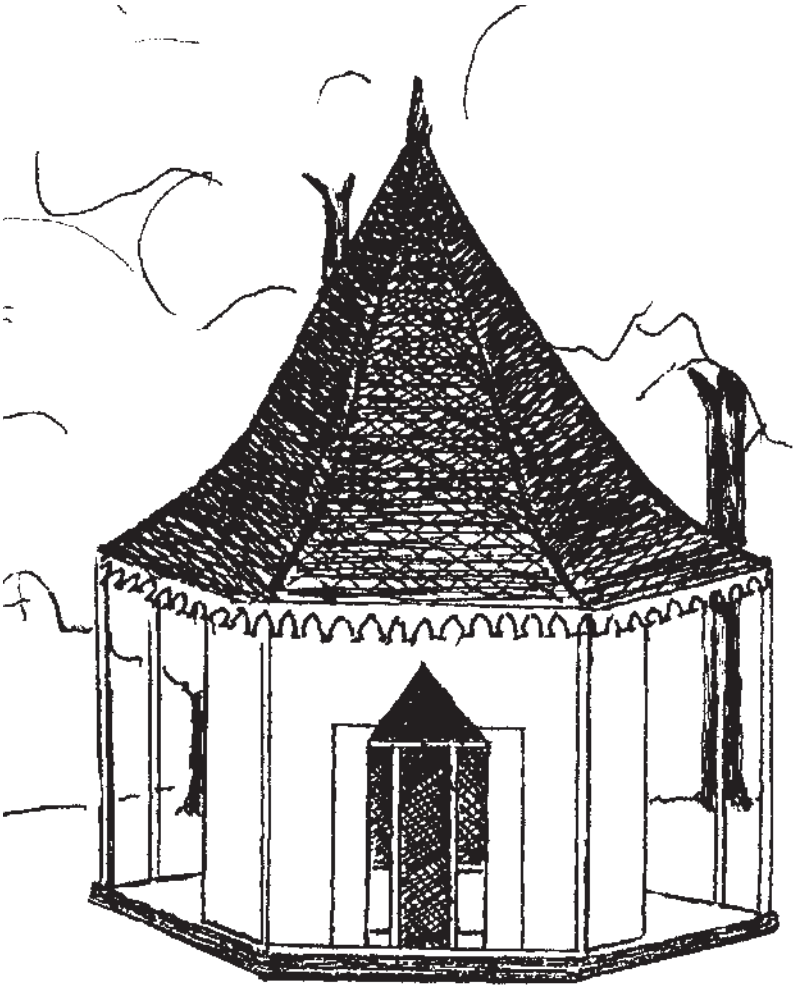
By Sumner Brown

The Belmont Center bridge is a magnificent granite arch structure. It is now 101 years old, and it is structurally as sound as the day it was built. It is also a monumental management mistake. Rational management would never have chosen such an expensive, robust design. The same mistake was made with Notre Dame Cathedral and the pyramids. We are lucky.

Underwood, Atkins Create Historic Bridge

Richard Betts in his book *Footsteps through Belmont* explains that the initial design for the bridge called for steel girders. Two prominent Belmont citizens, Henry O. Underwood and Edwin F. Atkins, made the railroad change the design to a granite arch. At the time the bridge was built, railroads had not been brought to their knees by cars, trucks, and roads built with someone else's money. Railroads were like Microsoft, or the Massachusetts textile industry in the 1830s. A railroad executive in 1907 could afford to humor his friends.

The bridge is not Belmont's only physical reminder of the Underwoods, who made their fortune with deviled ham, and the Atkins, who made theirs with sugar. We have the Underwood Swimming Pool, and also the Underwood School Department Administration Building, which was the library when first built. Habitat was an Atkins family home before becoming an Audubon sanctuary. Our town hall is on land given to the town by the Atkins. The land on which Belmont's current library sits was the Underwoods' front yard before the town took it by eminent domain, which the Underwoods resisted strenuously.



Bridge Arch Weighs 1,125 Tons

I hope this newsletter's curious readers have looked at the bridge and wondered how it was built. The picture at right of the bridge during construction shows a wooden frame that is the key to building a stone arch bridge. A typical stone in our bridge weighs about five thousand pounds. The average density of granite varies from about 2.7 to 2.8 g/cm^3, so granite is about as dense as aluminum. A typical stone is 2 feet by 2 feet by 7.5 feet. The wooden frame had to support the arch's 450 stones, or 1,125 tons of granite. Once all the stones of an arch are in place, the arch can support itself—and, in this case, several locomotives—but until the last stone of the arch is in place, the wooden frame must support them all.

It must have been exciting to see the frame removed as the weight shifted from the frame to the arch. I wonder how they got workers to go under the frame and take it apart.

BRIDGE UNDER CONSTRUCTION—1907

Photo of the Belmont Center Bridge reproduced from Richard Betts's Footsteps Through Belmont*, p. 40.*

Bridge Should Last for Centuries

Nothing lasts forever. The bridge's days are numbered, but there is no reason to think that it cannot last for centuries.

Our bridge's granite stone is a very durable material. You can see how slowly granite weathers by visiting an old cemetery where you can view various stones that have been dated and then exposed to the elements. Slate breaks, limestone dissolves, but granite is tough. After a hundred years, the lettering on slate and limestone markers is often illegible, but I have never found a granite headstone that showed obvious signs of weathering.

You can appreciate granite's durability by contemplating the Harvard Bridge, which crosses the Charles River from MIT to the Back Bay. Completed in 1890, the Harvard Bridge has granite pedestals with steel girders spanning between them. The upper part of the bridge had to be completely rebuilt in the 1980s, but the original granite pedestals were still sturdy.

The lifetimes of stone arch bridges vary. The Pont du Gard, an aqueduct built by Romans in the south of France in 18 BCE, is still in use as a footbridge. China's Anji Bridge was built in the late sixth century of limestone. It is still beautiful and still in use. However, London Bridge did not do as well. Built of granite in the 1820s, it sank into the soft soil of the Thames. By 1968, it was beyond use and put up for sale. It was disassembled, shipped, and rebuilt in the Arizona desert, the centerpiece of an English-style theme park.

The sinking of London Bridge raises the question of how far down our bridge's arch goes into the ground. If it goes to bedrock, it will not sink. A half-mile away is Clay Pit Pond where brick manufacturers found 20 feet of clay. Starting 200 yards from the bridge is Belmont Hill where you can find examples of bedrock at the surface. Our bridge shows no signs of sinking or spreading, so perhaps it goes down to

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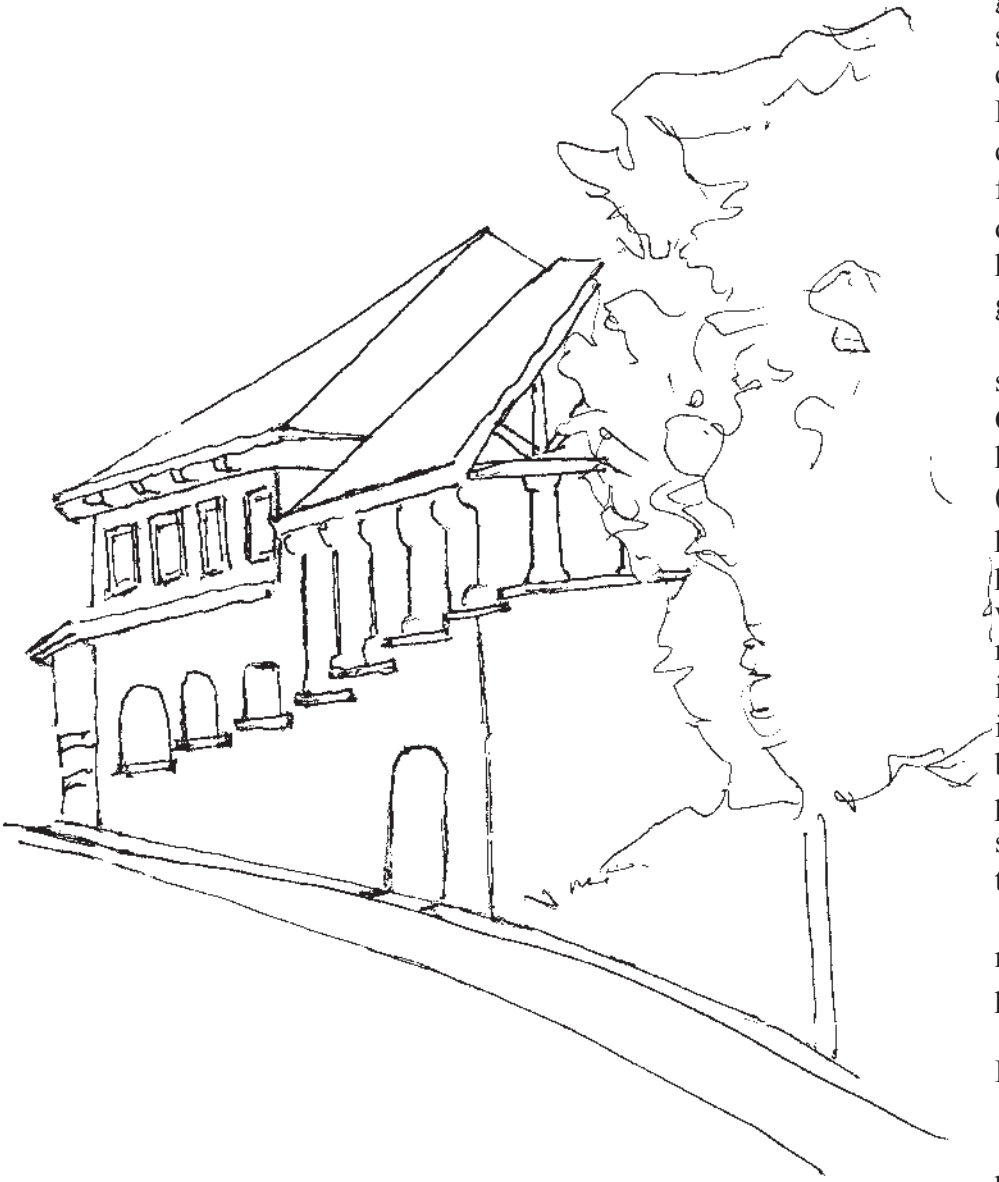


bedrock.

Water is the enemy of rocks and pavement, particularly in our climate, which has many freeze-thaw cycles per year. Belmont's bridge is largely sheltered from water. However, if you walk under the bridge on the eastern sidewalk you can see a place where water comes through the ceiling leaving mineral deposits that would turn into stalactites if left alone. The top of the arch is mostly waterproof to keep water out of the heart of the structure. The mineral deposits left by water may be coming from the mortar between the granite blocks.

Grimy Bridge Can Be Cleaned

The bridge's interior is more or less clean, light gray granite, while the vertical surfaces on the outside have a coat of black grime. Presumably, the grime was carried by water flowing down from the railroad platform during storms. Granite headstones do not collect black grime like our bridge.

The exterior vertical stone surface closest to the Lions Club has a small patch of handsome light gray granite (see photo p.12). It was recently power washed with water. That patch is a sample of how the whole bridge will look in the near future. Cleaning the bridge is part of a project that also involves landscaping near the bridge and repairing and painting the iron fence that serves as a guardrail for the train platform.

Structurally, the bridge does not need any help. The bridge project is about aesthetics.

Firenze Leads Cleaning

With Belmont's tight budget, there is no town money for the bridge project. Just as the bridge was built of granite due to the efforts of prominent Belmont citizens, the bridge will be cleaned because Angelo Firenze, chairman of the Board of Selectmen, is asking private citizens to make it happen. The project is estimated to cost about $35,000. One local business has already pledged $10,000.

The Selectmen endorse this project. Various town departments are also on board, including the Municipal Light Department, which will redo the lights under the arch. The plan is also supported by representatives of the Belmont Historical Society, the Sesquicentennial Anniversary Planning Committee, the Belmont Center Planning Group, the Belmont Center Business Association, the Lions and Rotary Clubs, the Belmont Garden Club, and the Belmont Town Club.

We need you.

If you can volunteer even a few hours a month, you can make a difference. You do not *need to be an expert—just a person who cares about our town.*

I can devote time to:

_____*Archaeology & Historic Preservation*
_____*Environmental Protection*
_____*Planning & Zoning*
_____*Traffic & Transportation*
_____*Mailings*
_____*Newsletter*
_____*Web site*

I can help pay for this newsletter:

It costs about $4000 to publish each issue of our newsletter. Please donate for this purpose:

_____*$25* _____*$50* _____*$100* _____*$250*

I can help pay for a sewer appeal:

_____ *$100* _____*$500* _____*$1000* _____*other*

I can help pay for cleaning the Belmont Center bridge:

_____ *$100* _____*$500* _____*$1000* _____*other*

*Name*_____

*Address*_____

_____

*Phone/E-mail*_____

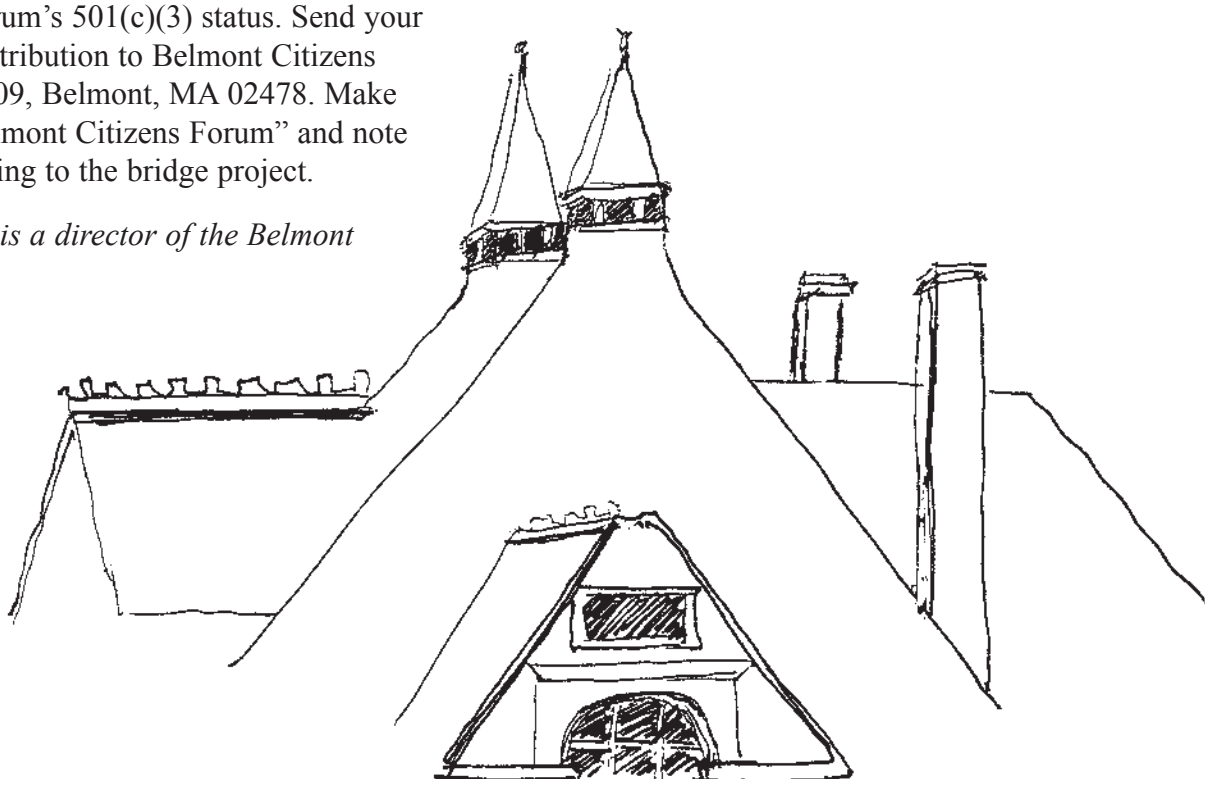
_____

If you have questions, please call (617) 484-1844. The Belmont Citizens Forum is a nonprofit 501(c)(3) organization. Your donation is deductible from federal taxes to the full extent provided by law.

Make checks payable to Belmont Citizens Forum and mail to Belmont Citizens Forum, P.O. Box 609, Belmont, MA 02478. Thank you!

The Belmont Citizens Forum is collecting contributions for the bridge project, which are tax-exempt because of the Forum's 501(c)(3) status. Send your bridge-project contribution to Belmont Citizens Forum, PO Box 609, Belmont, MA 02478. Make checks out to "Belmont Citizens Forum" and note that you are donating to the bridge project.

—Sumner Brown is a director of the Belmont Citizens Forum.



Belmont Citizens Forum
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Cleaning The Stones

The clean portion of the Belmont Center railroad bridge, above, has been power washed. *For more details, see page 8.*