Society for Industrial Archeology · New England Chapters

VOLUME 30 NUMBER 2 2009

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CONTRIBUTORS

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Call for Papers

22nd Annual Conference on New England Industrial Archeology

February 27, 2010
at Plymouth State University
Plymouth, New Hampshire
Deadline for paper proposals: January 8, 2010

The Northern New England Chapter of the Society for Industrial Archeology invites proposals for papers to be presented at the 22nd Annual Conference on New England Industrial Archeology. The conference is alternately hosted by the Southern New England and Northern New England Chapters as a forum for presenting research of America's industrial past. This year's conference is to be held at Plymouth State University in Plymouth, NH, on February 27, 2010. Presentations are welcomed on all topics related to industrial history, architecture, manufacturing, archeology, etc. Proposals may be submitted for individual papers, team papers, or reports on works-in-progress. As in past conferences, it is anticipated that the time limit for each presenter will be 30 minutes.

Format: Each presentation proposal must include: 1) title; 2) an abstract of not more than 300 words; 3) a brief (half-page) resume of the author(s), including postal address, telephone/fax, and e-mail; 4) a list of audio-visual requirements.

Deadline: Proposals must be received by January 8, 2010.

E-mail proposals in *MS Word* format to: ykforestry@yahoo.com

USPS to: Dave Coughlin, 276 Back River Road, Bedford NH 03110

NNEC-SIA PRESIDENT'S REPORT

This fall we did not have a tour, as Dennis Howe hosted the National Fall Study Tour of the cement industry at Rosendale in the mid-Hudson River Valley. I would like to thank Earl Young of Milford, Conn., and Harold Crowley of Wollaston, Mass., for sending past issues of the New England Chapter newsletter. The collection of past issues is almost complete, although a few issues from the 1980's may be difficult to locate.

One reason we would like email addresses of chapter members is to notify them of interesting tours and events related to industrial archeology. Some email addresses are very difficult to decipher, so please print clearly when writing it down while renewing your membership and at yearly gatherings. That way most members can be notified of upcoming events in additional to the annual meetings, tours and conferences. This will take a while to implement as we gather more addresses, but I'd like to be using the email list next year.

Carolyn Weatherwax, our treasurer, would like to ask all members to please pay for yearly membership on time. The chapter officers volunteer their time and it makes it much easier for us if renewals are made when reminders are sent out. So please help our chapter and send in your check for renewal as soon as possible.

Currently we are looking into creating a chapter website through the National SIA website, which is www.sia-web.org. Eventually we can also have direct access if we choose. Look for it after the first of the year. Upon entering the National website, members will find more industrial archeology information and may choose to become a national member and participate in the tours and meetings held twice yearly across the U.S.

David Coughlin
President, Northern New England Chapter

SNEC-SIA ANNUAL MEETING

The Southern New England Chapter held it's annual meeting at Fletcher Granite in Westford, MA, on September 17, 2009. Bill Burt and Craig Austin were re-elected President and Secretary. Sara Wermiel was elected Treasurer, replacing Bill Goodwin.

Matters concerning membership should be directed to Sara E. Wermiel, Treasurer, SNEC, 70A South Street, Jamaica Plain MA 02130-3143.

Submitted by
William Goodwin

NNEC-SIA SPRING 2009 TOUR

During a spring and summer of rain, the NNEC was fortunate to have a beautiful day in Bartlett, N.H., for its spring tour. It was organized by our vice-president Rick Russack and the nice day led to a large turnout of members.

In the morning we had a long and informative tour of the Kearsarge Peg Mill by owner Paul Soares and one long-time employee. Open in 1878, this is the only remaining wooden peg mill in the world. Modern peg mills exist in Italy and Germany but they use plastic to make their pegs. These pegs of various sizes were used to join the soft leather shoe uppers to the hard soles. At one time, there were 5-6 peg mills running in the White Mountains, supplying pegs by the millions to the many shoe factories in N.H. and Massachusetts. Originally the company mill was located further south in Andover, N.H., but in time the wood supply was depleted, so the mill relocated to Bartlett in 1878. Another former peg mill once owned by the same company is now the Common Man restaurant in Plymouth, N.H. Beech and birch are the two wood species used in the manufacture of the various sizes and shapes of pegs. In addition to pegs,

New England Chapters Annual Dues Schedules

NNEC: $15.00 member renewal
$10.00 Student
Mail to: Carolyn Weatherwax, NNEC Treasurer, 305 Heritage Way, Genaevoort, NY 12831

SNEC: $15 member renewal, before Feb. 1, 2010
$18 member renewal, after Feb. 1, 2010
$10 new member, first year membership
Mail to: Sara E. Wermiel, Treasurer, SNEC,70A South Street. Jamaica Plain MA 02130-3143

other items once manufactured at the mill over the years included toothpicks, bobbins, and tongue depressors.

Today very few shoe factories exist in the U.S., and fewer still use wooden pegs. A small market still exists at historic sites such as Old Sturbridge Village which demonstrate shoemaking and the cobblers trade. Recently an order of 2,000 pounds of pegs was sent to Texas for the manufacture of cowboy boots. The company has survived for over 140 years by finding new markets and uses for wooden pegs. Since the 1920's the pegs have been used for polishing and burnishing stones. Other dry media such as corncobs, walnut shells, and sawdust are now used to polish items. The business has recently doubled its orders by further expanding into polishing. Kearsarge Peg Mill uses 190 different compounds to polish fishing lures, buckles, golf club heads, woodstove pieces, even artificial knee parts, and dozens of other small items. Another modern source of income that helps the Peg Mill stay open is a cell tower attached to the tall brick smokestack at the mill.

For our tour, Gerry Demuro, board chairman of Heritage Mills, had arranged for the mill to run as we observed the various steps in the manufacturing of the small wooden pegs. Many steps and specialized equipment are required to turn a 4-ft. log into a peg less than one inch long and thin as a pencil lead. First the log needs to have the bark removed and this was demonstrated by hand and also with the more recent debarking machine. Then a slice of wood approximately an inch thick is sliced off the end of the log and moved to the next step by a conveyor belt. Much of this equipment was "hand made" by company employees and is one of a kind. A pointer machine is then used to make hundreds of small points on one side of the slice. Even this unique machine has to be versatile as there are 19 peg sizes that are made with points on one end. This pointed wood slice is then broken apart by more machinery and steps until all that should remain is a lone shoe peg. Next they are sent to one of four large rotating drums holding 300-400 gallons for drying. These drums are half filled with the pegs and hot air is blown into them to dry them. After drying, the pegs are screened by one of eight different screen sizes that allow only the individual pegs to drop through them. They are then bagged and ready for delivery.

The afternoon portion of day was a tour of the former sawmill town of Livermore. The mill was built in 1876 with the Sawyer River Railroad being completed soon after. The Saunders family were lawyers from Massachusetts that had extensive timber and landholdings in the area. Because they were not completely dependent upon timber for income, they selectively cut Red Spruce, leaving the forest in better condition than most logging operations at the time. The finished lumber was sent to Massachusetts by railroad. At its peak, between 200-300 people lived in the town. There was a company store, houses, schoolhouse, a mansion built by the owners, large sawmill, millpond, powerhouse, charcoal kiln, and numerous other structures.

In 1918 the mill burned down, causing residents to start moving away. Nine years later a flood destroyed the railroad line that ran into town. In 1951 the town of Livermore was unincorporated and ceased to exist. Peter Crane gave a detailed description of the former town with many excellent photographs from the past. We were shown the schoolhouse foundation, home foundations, and the heavy safe still inside the company store foundation. The most interesting ruin is the large sawmill area full of walls, bricks, and iron. Despite the millpond, it ran on steam power. The millpond was used to clean off the logs and prevent the drying and cracking of them before they are sawn into lumber. Those who made the long drive to northern N.H. had the opportunity to step back in time and see the current and past remnants of a once thriving wood products industry.

David Coughlin
President, Northern New England Chapter

NEW IA PUBLICATION

Past NNEC President, Dennis Howe has recently written a new book which documents the ruins of an American hydraulic natural cement manufacturing company that operated in Rosendale, Ulster County, New York, and provides the platform for a study of the beginning and development of an important predecessor of the enormous modern cement industry. The book is intitled *The Archeological Survey of a Rosendale Cement Works at Whiteport*.

The Whiteport mill c. 1890.

The archeological survey recorded industrial surface remains within a larger area of ruins that represent the Hamlet of Whiteport, NY, a company town. The recorded industrial remains include structures or structure complexes constructed between c. 1850 and c. 1895 by the Newark and Rosendale Lime and Cement Company, which produced natural hydraulic cement continuously at the site from c. 1848, when it purchased the works of Hugh White, until 1902, when the market for natural cement collapsed.

The mill's waterwheel remains.

Kilns at Whiteport.

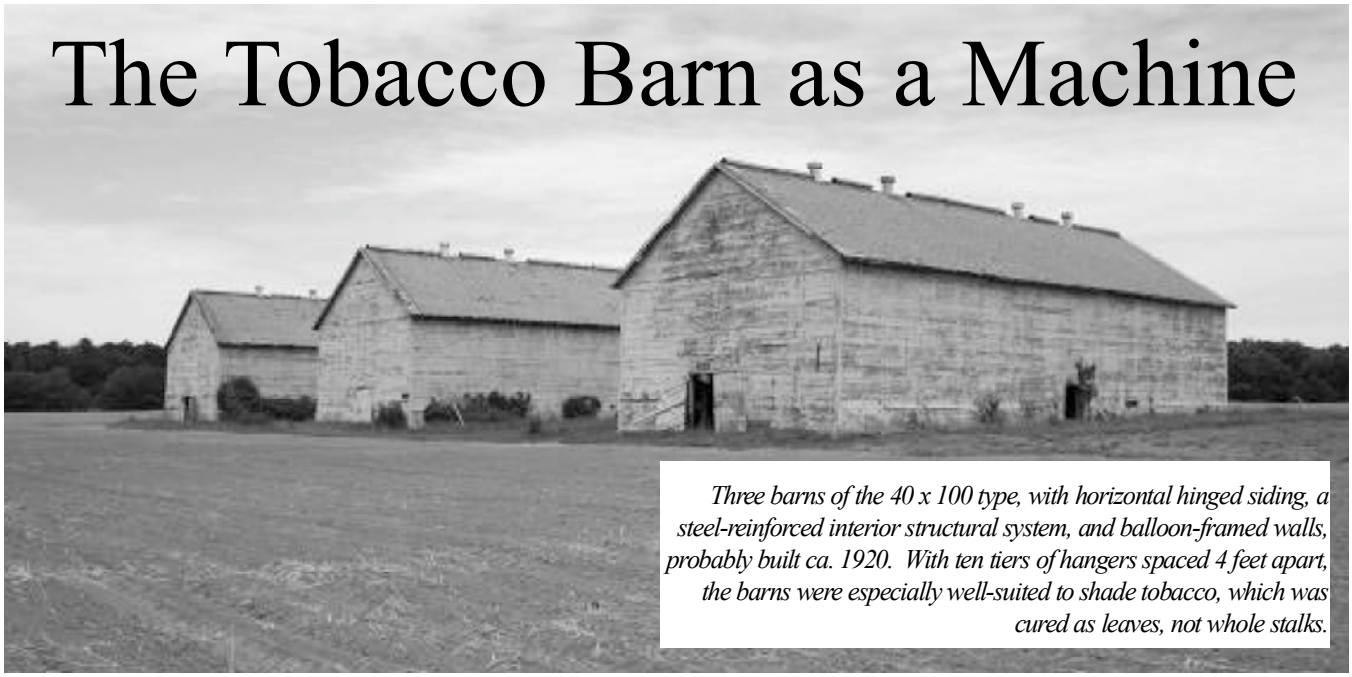
Hugh White was the brother of Canvass White, an engineer working on the Erie Canal,who, with the help of others, developed a method to produce hydraulic cement from natural limestone formations. The new cement was first applied in 1819 to the mortar for watertight lock construction. Canvass obtained a U.S. patent for the hydraulic cement in 1821 and soon put Hugh in charge of manufacturing. In 1836, with a contract to provide cement for the construction of New York City's Croton Aqueduct, Hugh moved the White's Cement manufacturing operation from Cohoes, NY, to an area of Rosendale, just south of Kingston, NY.

Included in the book is a synthesis of the Newark and Rosendale Company's mill organization, manufacturing processes, transportation infrastructure and cooperage. Whiteport was essentially abandoned soon after the company ceased making cement in 1902 and was never developed with later construction, which helped to make it a valuable archeological site for the study of the structures and artifacts of a very important historic American industry.

The Archeological Survey of a Rosendale Cement Works at Whiteport, 6"x 8-1/2", 79 pp., 42 illustrations, may be purchased for $15.00 from Whiteport Press, 220 Whiteport Road, Kingston, NY, 12401.

A shortened version of the Whiteport survey appeared in *IA, the Journal of the Society for Industrial Archeology*, Volume 33, No. 1 earlier this year. See http://www.sia-web.org/iajournal/siaia.html.

The Tobacco Barn as a Machine



Three barns of the 40 x 100 type, with horizontal hinged siding, a steel-reinforced interior structural system, and balloon-framed walls, probably built ca. 1920. With ten tiers of hangers spaced 4 feet apart, the barns were especially well-suited to shade tobacco, which was cured as leaves, not whole stalks.

Recently, written and photographic documentation was prepared for fourteen early-20th-century tobacco barns in Simsbury, Connecticut. The Connecticut State Historic Preservation Office requested that the buildings be recorded prior to their demolition to make way for a residential subdivision being planned for the surrounding fields. The barns were part of an extensive farm of several hundred acres operated until the late 1990s by Cullman Brothers, Inc., one of the region's largest producers of cigar-wrapper tobacco.

First a word about terminology: in the current Connecticut Valley vernacular, the term "tobacco shed" is commonly used, and there are those who say that it is the only proper term. Historically, however, the buildings were called barns or sheds with about equal frequency, so the choice was made to use "tobacco barn" throughout for the sake of consistency.

The documented barns are of two basic types: 1) long, narrow buildings measuring about 30 feet by 200 feet in plan with vertical siding boards, and 2) shorter, taller, wider barns that measure 40 feet by 100 feet in plan and have horizontal siding boards. All were built with packed-earth floors and frames resting on poured-concrete piers. One barn appears to have been assembled from two earlier barns that were moved to the site and joined together. It is the only one framed with poles as its uprights; typically in this type of construction, the poles would have been set into the earth, but like the others, the barn now rests on concrete footings. Some of the barns are framed with 12-foot bays and others have 14-foot bays. The shorter barns, which have balloon-framed side and end walls, were specifically built to facilitate the curing of shade-grown tobacco, whereas the long barns would work for either shade tobacco or field tobacco.

Barns have traditionally not been part of the purview of industrial archeology, but in this case an exception may be warranted: the tobacco barn can be considered a hand-operated machine, one specifically designed to provide a controlled environment in which harvested tobacco leaves can cure properly. The substantial interior framework, typically a jungle of uprights, transverse beams, and longitudinal bracing, has two functions: providing a convenient place for hanging the crop, and supporting the tremendous weight of green tobacco leaves, which were five times heavier than when fully cured. The exterior siding of every tobacco barn was originally configured so that some or all of the boards could be opened and closed, thereby either exposing the crop to the outside air or isolating it from outside conditions. Along with sill and ridge ventilators, the movable siding allowed some control over humidity and temperature. The rate at which the tobacco cured had a large effect on the

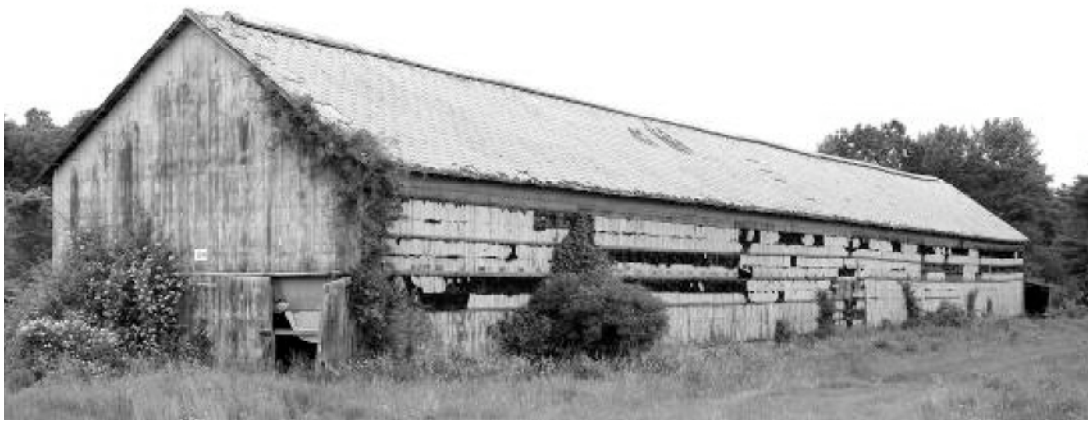
Detail of the barns' hinged horizontal siding.

quality of the final leaf, and therefore, the value of the crop. Prior to the 1870s, Connecticut Valley tobacco farmers typically cured their crop in open sheds or ordinary barns, sometimes with great success and sometimes ending up with an unmarketable mess suitable only for plowing under as fertilizer for next year's attempt. By 1880, the barn with movable siding had emerged as a specialized structure and remained relatively unchanged through the 1960s.

Early on, some growers were of the opinion that the sill and ridge vents provided most of the air circulation, and apparently this theory came to be accepted in Simsbury: most of the barns had their movable siding nailed in place at some point in time and, in some cases, covered over with rolled asphalt. Remnants remain, however, of four types of movable siding: vertical boards hinged at the side, vertical boards hinged at the top, pivoting vertical boards, and hinged horizontal boards. All the barns have hinged horizontal boards as ventilators at the level of the sills and most have some combination of ridge vents and sheet-metal ventilators along the roof.

Drying was itself not the goal of curing the tobacco; indeed, the last step was to allow the cured leaves to absorb a certain amount of moisture before being packed for shipment. Instead, the idea behind curing the tobacco was to facilitate chemical changes that would allow bitter flavors and odors to depart and the proper color to emerge. If the leaf dried too rapidly, the leaf would retain its green color and bitter taste. If there was too much moisture, the color of the leaf would become too dark, and "pole sweat," a fungal disease, might infect the crop. By opening and closing the siding boards and/or sill ventilators at different times of the day, growers had a better chance of maintaining the optimal temperature and humidity.

In the early 1900s, growers realized that some method of providing heat would increase their control over the rate of curing. Some experimented with stoves and steam heat, but small charcoal fires in pits in the dirt floor, covered with iron plates to more evenly spread the heat, became the norm. The documented barns illustrate a later innovation, piped-in gas (probably propane) distributed through 2-inch iron pipes along the sill. The small individual burners used in this system appear to have been designed as analogs of the earlier charcoal fires; standing on tripod legs, each has a circular gas element that heats a plate about 2 feet in diameter. The use of gas heat became common just after World War II.



A barn of the long and narrow type, with a ridge vent, pivoting vertical-board siding (now nailed in place), and hinged horizontal boards at the level of the sills, probably built in the late 1930s.

In addition to providing places to hang the laths to which the leaves or stalks were attached, the dense internal framing of the barns had to support the weight of the hanging tobacco. Using common estimates for barn capacity and yields given in the literature, this long barn might have had 20 or more tons of tobacco hanging in it at the start of the curing season.

Typical propane heater. Other tobacco-related artifacts found in the barns include piles of shade cloth and poles, lath for hanging the tobacco leaves, and a post-World War II "Gastobac"-brand gas thermostat.

At its height, Cullman Brothers, Inc. owned some 1,800 acres of tobacco land in Connecticut and leased hundred of acres more from other landowners. Despite the name, the company was a partnership of Joseph Cullman, Sr. (born in 1854) and his son, Joseph Cullman, Jr. (born in 1882), of New York City. The elder Cullman got his start in the tobacco business when he was just 14 years old, buying tobacco in Ohio and selling it on the New York market. Around 1906, the Cullmans started growing broadleaf in Connecticut, then quickly went into shade-grown tobacco.

Broadleaf, Havana seed (a field tobacco similar to broadleaf), and shade-grown tobacco could all be used to make the outer wrappers of cigars, but shade tobacco produced by far the highest quality leaf. In 1933, for example, shade tobacco made up only 22% of the crop by weight but 67% of its value. Shade tobacco, grown under the billowing loose-woven white cloth that was once such a prominent part of the central Connecticut landscape, was far more labor-intensive than field tobacco and much more capital-intensive as well. Unlike field tobacco, which was cured on the stalk, shade-grown leaves were picked continuously as they matured, and as a higher-value commodity, shade tobacco required more in the way of fertilizer, disease control, and weed removal. Consequently, the cultivation of shade tobacco became dominated by large corporate growers like Cullman Brothers.

In the 1940s, Cullman Brothers partnered with Morehouse College, a historically African American institution in Atlanta, Georgia, to provide summertime fieldworkers. The Morehouse students lived in dormitories supervised by college staff, and at least part of their wages went toward college tuition. One of the Morehouse students was Martin Luther King, Jr., who spent the summers of 1944 and 1947 working for Cullman Brothers in Simsbury. King led religious services for his fellow workers and considered his summers in Connecticut an important time in his spiritual formation.

Bruce Clouette, Historian,
Archaeological and Historic Services, Inc.

Some useful references related to tobacco barns:

Anderson, P. J.
1934 *Tobacco Culture in Connecticut.* New Haven, CT: Connecticut Agricultural Experiment Station.

Halsted, Byron D., and Edwin C. Powell
1911 *Barn Plans and Outbuildings*. Rev. ed. New York: Orange Judd Company.

Killebrew, J. B.
1910 *Tobacco Leaf: Its Culture and Cure, Marketing and Manufacture*. New York: Orange Judd Company.

O' Gorman, James F.
2002 *Connecticut Valley Vernacular: The Vanishing Landscape and Architecture of the New England Tobacco Fields*. Philadelphia, PA: University of Pennsylvania Press.

Purinton, Darcy, and Dale F. Cahill
2009 *Tobacco Sheds of the Connecticut River Valley.* Arglen, PA: Schiffer Publishing, Ltd.

U.S. Census Office
1883 *Tenth Census of the United States, 1880*. Report on the Culture and Curing of Tobacco. Washington, DC: Government Printing Office.

Rails to Trails to Industrial Archeology

Recently, the Connecticut SHPO requested state-level documentation of historic features along a two-mile length of the former Canal Line railroad right-of-way in Southington, Connecticut. The project envisions adding the segment to an existing linear park that runs northward from the village of Plantsville. The goal of the recording project was to locate and photograph any bridges, culverts, former railroad buildings, or other rail-related features prior to construction.

The Canal Line was built by the New Haven and Northampton Company as a replacement for the Farmington Canal. Work began soon after the company's charter was amended in 1846 to allow it to build and operate a railroad, and by the end of 1847 the line was completed from New Haven to Plainville, Connecticut. The initial survey for the line was carried out by Alexander C. Twining (1801-1884), who had studied engineering at West Point as a private student following a stint as a mathematics tutor at Yale. Twining laid out many of the early railroads in Connecticut before retiring to pursue scientific study and lecturing.

The New Haven and Northampton Company was acquired in 1887 by the New York, New Haven and Hartford Railroad Company, which operated it as its Northampton Division. The single-track line was substantially improved in the early 20th century to accommodate the increasing weight of steam engines, resulting in upgrades and replacements for many of the bridges. Later operators of the line were Penn Central, Conrail, Boston & Maine, and Guilford Rail System. The last freight train ran over this portion of the route in 1999, though Guilford continues to provide service to a short segment of the former Canal Line in Plainville and the north part of Southington.

Currently, the right-of-way is heavily overgrown with bushes, vines, and other vegetation. In order to locate the rail features, the project's historian and historical archaeologist consulted the 1915 right-of-way and track map prepared by the railroad as part of the valuation survey required by the Interstate Commerce Commission, cross-checking the resulting list of bridges and culverts against railroad bridge lists from 1918, ca. 1960, 1974, and ca. 1985. A total of three bridges, six culverts, a "subway" (an undergrade pedestrian passage), and one former freight and passenger station were identified and recorded. The documentation forms part of the Connecticut Historic Preservation Collection archived at the Dodd Research Center, University of Connecticut, Storrs.

From the perspective of the history of engineer-

ing and technology, the rail-related features along this part of the route are small-scale and ordinary. Probably the oldest structures are two small stone box culverts constructed with coursed-ashlar side walls and slab lintels; these have a good claim to be part of the original 1847 construction episode. The material is primarily brownstone, with other, metamorphic stone mixed in. There are also three iron-pipe culverts, the retaining walls of which are of similar brownstone masonry, suggesting that they

Simple stone box culvert on the former Canal Line in Simsbury, CT, possibly part of the line's original 1847 construction.

Rail-stringer and concrete-slab culvert, a ca. 1916 replacement for an earlier stone box culvert.

Plate-girder bridge, 1914, Boston Bridge Works, one of two ca. 1900 girder bridges on this two-mile section of the former Canal Line.

Detail of "5-ply" I-beam cattle-pass bridge, 1915, railroad-built using salvaged and new steel.

The Milldale station, a combined passenger and freight depot built in 1894 and made smaller after a 1928 fire.

were rebuilt from earlier box culverts (the presence of several stone slabs discarded near one of the pipe culverts may support this theory). Another stone box culvert was rebuilt ca. 1916 as a rail-stringer culvert. Closely-spaced eight-foot-long sections of reused rail were laid across the earlier stone walls, then a 10"-thick concrete slab was poured on top of the rails.

The bridges include a 65' deck-plate-girder span, fabricated in 1900 by the Berlin Construction Company; a 43' through-plate-girder span produced by the Boston Bridge Works in 1914; and a multiple-I-beam bridge, 16' long, built in 1915 by the railroad itself using a combination of new and salvaged steel. The latter consists of two sets of five 14"-deep rolled I-beams set on brownstone abutments. The bridge spans a small stream, but it had the additional function of maintaining a required cattle pass under the right-of-way. The use of multiple small I-beams (called "5-ply" construction by the railroad), rather than a pair of large beams or girders, allowed about 5' of headroom under the structure.

The small, one-story clapboarded Milldale station was built in 1894 following a standard New Haven Railroad plan; similarly detailed depots remain in Wethersfield, Cromwell, and Rocky Hill, Connecticut. The gable roof has a wide overhang on all sides, supported on simple stick braces; the track-side slope of the roof is longer than the street-side, thereby providing more shelter for people awaiting trains. The nearby reinforced-concrete passageway under the tracks, built in 1916, was not for railroad passengers but rather for the use of workers from the nearby Clark Brothers bolt factory. While the main part of the factory was on the west side of the tracks, the company also had a power plant and siding on the east side. The passageway led directly into the basement level of the ca. 1900 factory, which is listed on the National Register of Historic Places.

The Southington rails-to-trails project raises an interesting historic-preservation issue: the station, bridges, and culverts all represent standard railroad practice of the period. Typically, historic-bridge surveys have not given much priority to culverts, beam bridges, and plate girders. Yet at some point, such features are going to become so reduced in number that they will need to be evaluated as rare survivors of once-common forms. At what point do we begin planning for preservation of a representative sample? The Southington rails-to-trails will probably be able to re-use many of the structures (all of which all carried an E60 rating when in use by the railroad), but conceivably the day could come when the last riveted plate-girder railroad bridge in Connecticut is slated for demolition.

Bruce Clouette, Historian,
Archaeological and Historic Services, Inc.

Main Pier with Ramp to shore and South Boat House attached at midpoint, center; T-Boat Pier, lower right.

The United States Coast Guard Academy in New London, Connecticut is located on a roughly 100-acre parcel on the west side of the Thames River, about a half-mile north of the Route I-95 Bridge. Construction of the campus began in January 1931 and was completed to receive the September 1932 incoming class of cadets. Although the Academy has been in a constant state of development and repair since its inception, many of the Academy's core buildings and structures including those on the waterfront retain their original character and use. A 1996 study of the Academy property identified it as a potential National Register/National Historic Landmark Historic District.

The Coast Guard today is the product of the creation and merging of five formerly separate federal services over the course of 230 years. The Revenue Cutter Service, considered the founding organization, was established in 1790 by Secretary of the Treasury, Alexander Hamilton, to enforce customs laws. The Service used fast sailing ships called cutters to intercept merchant ships trying to dodge import tariffs imposed by the new government to raise revenue. In 1915, President Woodrow Wilson signed the "Act to Create the Coast Guard," combining Revenue Cutter Service with the Life-Saving Service, a separate function of the Treasury established in 1878. The Lighthouse Service, established 1789, was merged into the Coast Guard in 1939. The Bureau of Marine Inspection and Navigation, formerly the Steamboat Inspection Service, established 1838, and the Bureau of Navigation, established 1884, joined the Coast Guard in 1946. In 1967, the Coast Guard was transferred from Treasury to the newly created Department of Transportation and in 2003 it joined the newly created Department of Homeland Security. The U.S. Coast Guard Historian's Office maintains an extensive website with dozens of downloadable articles and papers on all aspects of the history of the Coast Guard.

For the first 85 years of the Revenue Cutter Service, its officers came from the ranks of the Navy and the Merchant Marine. Congress established the first official training program for cadets, known as the Revenue Cutter School of Instruction, in 1876. The school was initially based on the schooner Dobbin but in 1878 moved onto

the Chase, a new 106-foot three-masted bark built expressly as the school's training ship. The Chase was homeported in New Bedford, Massachusetts, berthed at the north end of Fish Island. Classes were held aboard the Chase and in leased buildings on the island that also served as drill halls and storage.

The first land-based home for the School was established in 1900 on a 65-acre parcel at Arundel Cove near Curtis Bay, Maryland. The property came with a dock, boat shed, carpenter shop, storehouse and a dwelling, which were adapted to the school's needs. In 1907 the Chase was replaced by the 190-foot bark Itasca, powered by both wind and steam. "While under sail, Itasca's triple-expansion steam engines were the focus of engineer cadets, who dismantled and reassembled the engines to learn the purpose of the components and the theory of operation."

Arundel Cove proved incapable of supporting the needs of the school, particularly the Itasca. In 1910 the School moved into the Revolutionary-period Fort Trumbull in New London, Connecticut and officially became the Revenue Cutter Service Academy. New London was a great improvement in terms of location, both sea and land, but the Fort itself was "decrepit" and funds for its improvement were lacking. In 1915, Congress nearly cut the Revenue Cutter Service out of the budget, but instead put the Life-Saving Service under its command and named the new organization the United States Coast Guard.

Two modest wooden buildings were erected at the Fort during World War I to serve as barracks, mess hall and school quarters, but the facility remained woefully inadequate. During the 1920s Congress pressured the Coast Guard to do more to interdict Prohibition-era alcohol-smuggling vessels known as Rum Runners while refusing appropriations to improve the Academy. In 1925, USCG Commandant Rear Admiral Frederick C. Billard complained to Congress that the "lack of proper buildings, good roads and walkways, and a suitable space for drill and athletics…is a profound discouragement to the school." Lawmakers finally acted in February 1929, appropriating $1.75 million (later increased to $2.5 million) for the construction of a new academy. New Bedford, Seattle, and other port cities lobbied to home the new Academy, but New London closed the deal by quickly purchasing land on the Thames River and offering it to the Coast Guard. The engineering department of the Academy designed its new campus, assisted in the architectural design of the buildings by the Supervising Architect's Office of the Treasury Department.

The core academic, administrative and residential buildings of the Academy are large, brick Colonial Revival style structures located on high land overlooking the river. The property slopes down to a flat shorefront area built on filled land created with sediment dredged from the pier berths and placed behind the shoreline bulkhead. The tracks of the former New London, Willimantic and Palmer Railroad built in 1849 run along the edge of the river separating the shoreline from the upland campus.

The busy railroad was an obstacle to the use of the waterfront. A vehicular bridge over the tracks was a necessity for safety reasons and for uninterrupted access to the pier and shore-side facilities. A rock outcrop projecting into the river provided the logical site for the bridge: the railroad had cut straight through it leaving high rock walls flanking the tracks that could serve as abutments. The sloping outcrop provided a ready foundation to carry

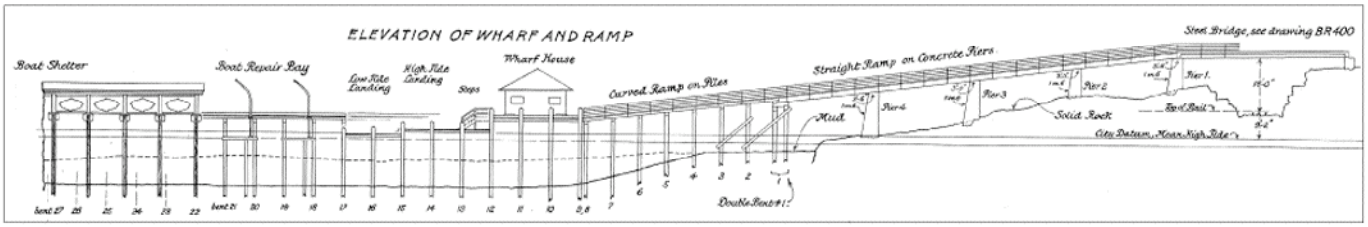


Figure 1: Elevation of Main Pier. USCGA Drawing No. W-401, 6 October 1930.

Figure No. 2: Ramp spanning T-boat Pier.

the shore access road on a series of short spans down to water and directly onto the Main Pier. The resulting structure is an unusual combination of railroad overpass bridge, inclined multi-span approach ramp and marine pier (Figure 1)

The Overpass Bridge is of steel girder and floor-beam construction with a concrete slab deck. It has a clear span of approximately 55' and a width of 16'. The Ramp, as it is known, is 16' wide, 205' long with a 10-degree incline. The upper straight section is of wood, steel and concrete construction, and carried over the rock outcrop on four concrete piers spaced approximately 34' apart (Figure 2). The lower, curved section is 70' long, of timber construction, and carried over the water on wood 3-pile bents to connect with the Main Pier.

The Main Pier is of typical timber pier design and construction consisting of regularly spaced pile bents with solid timber caps, cross bracing, longitudinal stringers and a single layer plank deck. The pier is 410' long by 20' wide, with 4-pile bents, spaced 10' apart. The south side of the pier was dredged to 18.5 feet to berth the Alexander Hamilton training ship and other deep draught vessels. The north side of the pier was equipped with special features unique to the Academy's mission that included a Boat Shelter for ten boats (today called the South Boat House), a boat repair bay with davits for hoisting small boats up to be worked

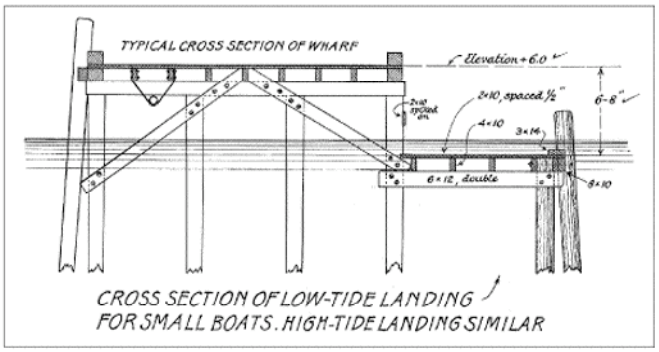


Figure No. 3: Cross section of Main Pier (Wharf). USCGA Drawing No. W-403, 6 October 1930.

on (no longer extant), and two small boat landing areas set at lower elevations than the main pier for low tide and high tide docking. The low tide landing and small wharf house mounted on the shore end of the pier are no longer extant (Figure 3).

The South Boathouse attached to the north side of the Main Pier is another unique feature. It is an open sided wood structure, 120' long by 32 feet deep, consisting of a low-pitch gable roof supported on wood pilings (Figure 4). It is equipped with ten boat bays, 12' wide by 32' long, separated by narrow walkways bolted to the pilings between each bay. It was originally designed for the storage of double-ended rescue boats that were lifted straight up out of the water on cradles hoisted with chain-falls. The same use continues today except the boats are inflatable, the hoisting gear is electric and cradles are not used.

Additional waterfront facilities were built during World War II including two additional pile-supported boat houses next to the shore bulkhead and a new "Finger Pier" located south of the Main Pier, known today as the T-Boat Pier. The T-Boat or Tug Boat Pier is of the same design and construction as the Main Pier but half as wide with only two piles per bent. It extends south from the Main Pier (hence the name finger pier), passes between two of the concrete piers supporting the Ramp, then turn two angles and runs due east 304' out into the river. It remains as originally built in 1943 with the exception of a new deck and selected fender-pile replacement done in 1983.

The engineering technology represented by the

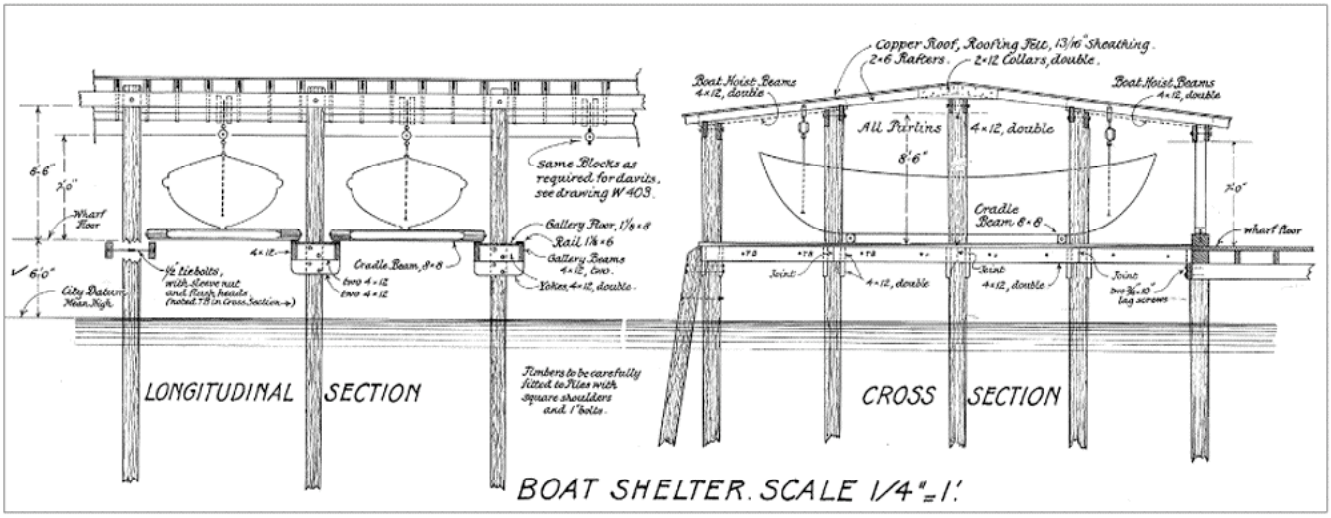


Figure No. 4: Sections of South Boathouse on Main Pier. USCGA Drawing No. W-402, 6 October 1930.

Academy piers and associated structures, wood piles, sawn pile caps, braces, stringers and decking, treated with chemical wood preservative, has been used for wharves and piers from the late 19th century to the present day. The combination of an inclined trestle and pier was used in 18th century England to carry narrow-gauge coal cars over land and onto piers to be dumped into barges. In the United States there are many late-19th and early-20th century examples of timber trestles and piers merged at waterfront terminals to facilitate the transport of bulk materials by water such as coal, ore and grain. Whether the Coast Guard pier represents a unique design for a naval or non-industrial waterfront facility remains to be determined.

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Notes

This article is condensed from: "US Coast Guard Academy, New London, CT, Piers & Structures." Connecticut State Historic Preservation Office Historic Property Documentation prepared by Richard M. Casella, Historic Documentation Company, Inc., Portsmouth, RI., for United States Coast Guard Academy, Environmental & Safety Branch, New London, CT. September 21, 2009.

Historic Resources Inventory and Determination of Eligibility Report for United States Coast Guard Academy. Prepared for U.S. Coast Guard by Greenhorne & O'Mara, Inc., Greenbelt, Maryland, February 1996, p. 12.

For more history of the Academy see: "The United States Coast Guard Academy: A Brief History." http://www.cga.edu/uploadedFiles/uscga_history_ final.pdf.

Visit the U.S. Coast Guard Historian's Office website at http://www.uscg.mil/history/.

"Cutter History." U.S. Coast Guard Historian's Office website at http://www.uscg.mil/history.

"The United States Coast Guard Academy: A Brief History," p. 11.

Ibid., p. 12.

"Coast Guard Academy Moves to a New Home." New York Times, September 25, 1932.

Robert E. Johnson. *Guardians of the Sea: History of the United States Coast Guard, 1915 to the Present*. Annapolis: Naval Institute Press, 1987. As quoted in Greenhorne & O'Mara, 1996, p. 11.

The line became the New London Northern Railroad in 1861, was leased to Central Vermont Railroad in 1871, was taken over by the Grand Trunk Railway about 1900, followed by numerous names and owners up to its current operation as the New England Central Railroad.