NEW HAVEN RAIL YARD, CENTRAL STEAM PLANT AND OIL STORAGE
Vicinity of Union Avenue
New Haven
New Haven County
Connecticut

HAER CT-160-C
CT-160-C

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
PHILADELPHIA SUPPORT OFFICE
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HAER No. CT-160-C

Location: Vicinity of Union Avenue
New Haven
New Haven County, Connecticut

USGS New Haven Quadrangle, UTM Coordinates:
18.673360.4573110

Date of Construction: 1930

Design Consultant: Gibbs & Hill
Contractor: Tredennick-Billings Company

Present Owner: Connecticut Department of Transportation
2800 Berlin Turnpike
Newington, Connecticut 06111

Present Use: Vacant; formerly oil-fired steam-heat plant

Significance: The Central Steam Plant is significant as an important component of the New Haven Railroad's maintenance and repair facilities. It was built during a time of thriving passenger service, a period in which the railroad also undertook a massive rebuilding program that updated its freight-car fleet. Through a network of overhead pipes, the plant provided steam to heat the entire shop complex, as well as the nearby passenger station. The boilers, pumps, and other machinery are of interest as examples of early twentieth-century steam-plant technology.

Project Information: The rail yard is being reconfigured to provide for improved operation of commuter and Amtrak Northeast Corridor trains and to provide a storage yard for commuter equipment. The project requires removal of the building. This documentation was undertaken pursuant to a Memorandum of Agreement among the Federal Transit Administration, the Federal Railroad Administration, the National Railroad Passenger Corporation, the Connecticut Department of Transportation, the Connecticut State Historic Preservation Office, and the Advisory Council on Historic Preservation.

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Description

There are two components to the New Haven Railroad's Central Steam Plant, built in 1930: a large steel-framed, brick-walled building that houses the boilers and fuel pumps, and a reinforced-concrete oil-tank structure. The boiler building measures 123' x 44' in plan, with its long axis extending in a southwest to northeast direction, and it rises to a height of 63' above ground level. It has a nearly flat, built-up roof concealed by a 3 ½' parapet. Two circular steel stacks, each about 6' in diameter at the base, extend about 60' above the roof near the west parapet. The stacks are shorter replacements, probably ca. 1950, for the original steel stacks that rose 205' above the ground.

Forty feet to the south of the boiler building is the 44' x 123' oil-storage structure. Containing three 38'-diameter tanks, the structure consists of 14'-high reinforced-concrete perimeter walls and an asphalt covering for the tanks and the surrounding fill that is now broken up by the growth of vegetation. Vent pipes and access-hole covers are set into the asphalt. At the base of each tank is a small concrete box, with a sheet-metal door, housing valves. Each tank has a capacity of 100,000 gallons; two are labeled for #6 fuel oil and one for #2 oil. Because the plant was designed to burn low-grade oil, the tanks are heated with steam pipes so as to keep the oil at a temperature at which it would flow. The area between the oil-storage structure and the boiler building, enclosed by a chain-link fence, contains valves, pipes, and transformers.

The boiler building has a structural system of 12" x 12" rolled steel I-beam columns, spaced 18' on center, with similarly sized longitudinal and cross beams; a brick-walled exterior encloses the steel frame. The building rests on a poured concrete foundation, with concrete slabs for the two floors. The exterior has tall window bays between brick pilasters, above which runs a concrete cornice, then a low top story with small window openings. There are four bays on the east and west side elevations and three bays on the north and south end elevations. Divided-light steel industrial sash includes pivoting portions to provide ventilation.

Inside, the boiler building is divided into two levels. The lower level contains steam-driven piston pumps for carrying oil from the tanks to the boilers on the east side and a long open corridor on the west side. The empty space was provided to allow for draft fans, ash hoppers, and ash-handling equipment if the plant were ever converted to coal.

The second level houses the plant's four huge boilers and is open to the roof. The longitudinal drum boilers were made by Babcock and Wilcox and were rated at 610 hp. each. Together, they were capable of providing a steady 72,000 lbs. of steam per hour, with an overload capacity of an additional 72,000 lbs. The space in front of the boilers was made sufficient for the installation of stokers in case of conversion to coal. The components of the boilers are built into thick brick walls. Each boiler has at its base six oil burners arranged in two rows of three, except for the southmost boiler, which was converted to two burners. Fuel-supply piping with valves allows the burners to be used together or in any combination. Above the burners, each boiler has a pair of large metal doors that open to expose the ends of the boiler tubing. Three round-topped steam chambers are at the top of each boiler. The two metal stacks each serve a pair of boilers. The stacks, which are about ten feet in diameter at this point, are supported by collars resting on large four-sided beam structures integrated into the building's framing. A series of longitudinal and crosswise triangular trusses, 12' in depth, supports the roof and provides bracing for the plant's frame. A steel-grate catwalk runs at the level of the trusses' lower chords.

Other equipment remaining in place includes chain-driven draft flues on the basement level and three steam-driven water feed-water pumps, water tanks, and a small start-up boiler on the main level.

Historical Background

Prior to the construction of this central heating plant, the various buildings within the New Haven rail yard were heated by thirteen separate boilers, six of the largest of which were no longer regarded as safe. By consolidating these into a single new system connected by overhead steam pipes, the railroad was able to achieve greater efficiency and save on operating costs. In addition to the various repair shops and equipment service buildings, the plant provided steam for heating the New Haven passenger station, the railroad's general office building, and the nearby railroad-owned Garde Hotel. The steam was also used to warm passenger cars on storage tracks. Although designed to use fuel oil to fire the boilers, the building was built large enough to accommodate automatic stoking equipment if the use of coal became more economical. Normally, only three of the four boilers were in operation, the fourth being held in reserve or taken out of service for cleaning or maintenance.

Significance

The Central Heating Plant demonstrates the New Haven Railroad's ongoing investment in the New Haven Rail Yard, even as the railroad had other, larger shop facilities elsewhere. In the late 1920s, the New Haven shops completed a massive rebuilding of thousands of boxcars and other freight cars, and the yard was also a key facility for maintaining the railroad's gas-electric railcars. New Haven was a major passenger hub where several lines converged, a terminus for the railroad's New York City commuter service, and the location of the railroad's main office.

Although certainly not flush with cash, the railroad benefitted from strong growth in both freight and passenger business during the 1920s, and so was able to afford such a significant addition to the complex (at least until the Depression brought the economy to a standstill). By replacing a number of smaller facilities with a modern, efficient one, the heating plant promised significant future savings. In addition to ensuring the continued viability of the repair shops, the steam plant supported the railroad's passenger operations by providing a reliable source of heat for the station, for the associated hotel, and for passenger cars waiting to go into service (virtually all passenger cars were steam-heated and so had to be kept connected to steam lines unless they were to be taken out of service for a long period).

The design of the plant included a number of features that were intended to maximize cost savings. It was designed to use an extremely low-grade (and therefore inexpensive) oil, which would not have been possible without the provision for heating the fuel tanks and lines so that the oil would flow readily. The plant was also laid out with enough room for additional equipment so that it could be converted to coal operation should that fuel become more advantageous. Finally, the multiple independently supplied burners offered a way of fine-tuning the output of the boilers to the load so as to minimize fuel consumption. When it was in operation, the plant provided automatic recording of fuel oil temperature and pressure, stack temperature, feed-water temperature, and steam output; daily charts were prepared so as to maintain high operational efficiency.

The plant was designed by the firm of Gibbs & Hill in cooperation with the railroad's own engineers. The principals in the firm–George Gibbs and E. Roland Hill–had a long history of work on important railroad projects. Gibbs, a Stevens Institute graduate, worked for both Thomas Edison and George Westinghouse. Shortly after 1900, Gibbs designed the first all-steel subway car for New York City's Interborough Rapid Transit line, along with innovative safety systems such as an automatic car brake and sliding-door latches. In 1909 and 1910, Gibbs and his then-assistant Hill worked full-time on the superstructure, tunnels, and electrical systems for Pennsylvania Station, supervising a budget of some $100 million. After the Pennsylvania Station project, they formed Gibbs & Hill, Inc., which soon became widely recognized as a leader in the field of electric traction.

The Tredennick-Billings Company was a Boston contractor that worked regularly for the New Haven Railroad on large building projects in the early 20th century.

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