

Coal Trestle
Delaware, Lackawanna & Western Railroad
Scranton
Lackawanna County
Pennsylvania

HAER No. PA-132D

HAER
PA.
35-SCRAN,
4-D-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

HAER
PA
35-SCRAN
4-D-

HISTORIC AMERICAN ENGINEERING RECORD

Delaware, Lackawanna & Western Railroad: Scranton Yards:
Coal Trestle

HAER NO. PA-132D

LOCATION: Ramp located 685 feet south of Bridge Street and Lackawanna Avenue, Scranton, Lackawanna County, Pennsylvania

UTM: 18/44405/458395
QUAD: Scranton

DATE OF CONSTRUCTION: 1906

CONTRACTOR: Delaware, Lackawanna & Western Railroad

PRESENT OWNER: United States Department of the Interior, National Park Service

PRESENT USE: Not in use.

SIGNIFICANCE: The coal trestle of the D,L & W's Scranton yards supplied coal and sand to all locomotives working on the Scranton mainline. It represents the railroad's commitment to efficient and economical maintenance procedures, and is typical of wooden coal trestles of the early twentieth century.

HISTORIANS: Amy Slaton
Delaware, Lackawanna & Western Railroad: Scranton Yards Recording Project, 1989

INTRODUCTION

Steam locomotives of the Northeast United States burned hard anthracite coal, soft bituminous coal, or a mixture of the two, each type of coal giving a different speed or duration to the engine's "run". From 1906 until the advent of diesel power in the 1950s, steam locomotives operating out of the D,L & W's Scranton yards were fueled at a large coal trestle in the center of the yards. The wooden trestle, which had a reinforced-concrete approach ramp and pier footings, had thirty-two coal pockets and a total capacity of 1,700 tons of coal. Loaded coal hoppers were pushed up a 1070-foot incline by a yard locomotive, and their contents were bottom-dumped into coal pockets, built above the level of locomotive tenders. Retractable metal chutes could be lowered from the pockets to fill waiting tenders below. In 1912, this method of fueling locomotives was said to cost about $1\frac{1}{2}$ to 3 cents per ton, far less than shoveling coal from hoppers to tenders by hand (at a cost of 25 cents per ton), as each tender held between eleven and twenty-eight tons of coal.¹ The gravity dumping pockets were also fast: a tender could be filled in about one minute², minimizing the amount of time an engine was idle (time lost at the coal station generally had to be made up once the engine was en route again, causing extra expenditure of coal³). Finally, gravity-operated coal trestles kept the handling, and thus

the breakage, of coal to a minimum and hence kept the coal's performance at a peak, avoiding "the disappearance of coal through wind gusts or being carried through flues and stacks of locomotives unconsumed."⁴

It may be noted that in 1906, the D,L & W was also building a coal trestle in Murray Hill, New Jersey, almost entirely of reinforced concrete. An account by its designer, D,L & W consulting engineer George Hand, suggests that concrete coal trestles were a new idea at this time, easy to maintain and only slightly more expensive than wood. But it is not unreasonable that the company chose wood for its Scranton trestle: though the railroad was known as an innovator in concrete use, it is significant that the Murray Hill trestle was built by the D,L & W for a retail coal dealer on their line, who would have born the expense of using concrete.⁵ In 1918 wooden coal trestles were still being constructed, suggesting that they were far from obsolete in 1906.⁶ Finally, photos suggest that the 1906 Scranton Yard trestle probably replaced an earlier, smaller wooden trestle on the site, and may have used long timbers remaining from the earlier structure.⁷

LOCATION AND STRUCTURE

The D,L & W coal trestle of 1902 stood near the roundhouse where lighter engine repairs were done (heavier repairs were

contracted out to local machine shops at this time), and directly adjacent to the ash pits at which engine fires were cleaned out. The cleaning and fueling of locomotives and minor repairs between runs were accomplished in quick succession; the coal trestle had the capacity to load dry sand (used to gain traction on grades) into the engines, and water spouts stood nearby as well. It was typical of the D,L & W's operation to avoid tying up their rolling stock in travel between maintenance facilities. Other D,L & W yards near Scranton, such as the passenger car and freight car shops and coal train yards, had their own coal-fueling stations, their capacity varying from 150 to 1,260 tons as demanded by locomotive use at those sites.⁸ It is significant that much later fueling facilities at Scranton--the diesel tanks of the 1950s--were located very close to where the 1906 coal trestle stood. This location was clearly still considered to be the most efficient for Scranton fueling operations.

The coal trestle followed in large part what are labeled "standard" plans of the D,L & W.⁹ These plans were modular in that they could be used for trestles with varying numbers of coal pockets. It is probable that some of the coal trestles on the line, such as the D,L & W's Binghamton and Syracuse yard trestles, that were not recorded as being link-belt conveyer or bucket-lift trestles, followed these plans.¹⁰ At Scranton, a concrete ramp, 163 feet long, rose at a gradient of about 1 per cent to meet the lowest of sixty-six wood bents, or supporting sections, of the

trestle. The bents were built of 12" x 12" yellow pine timbers, and a standard gauge track was set on narrow wooden stringers that sat atop the bents. The entire incline was 1,070 feet long, rising at a gradient of about 4 per cent to an almost level 300-foot section holding the thirty-two coal pockets, sand dryer, sand house, and a 10' x 5' x 8' enclosed area for the trestle workers. All exterior faces of trestles were painted, probably as weather proofing, and water piping for fire protection ran along the outside of the pockets.¹¹ A set of tracks ran at ground level on either side of the trestle, allowing two engines to be serviced at once. The sand house could also accommodate two engines, having a spout on either side.¹²

Each coal pocket in the Scranton trestle had a capacity of sixty-two tons, and was constructed to let coal flow downward when chutes, operated from a 30-inch-wide wood catwalk on the trestle's exterior, were lowered. The kind of coal in each pocket varied over the trestle's life. When the trestle was built in 1906, the D,L & W's trains burned only anthracite. Early photos show that certain pockets of the Scranton coal trestle were labeled "buckwheat," a small grade of anthracite, and others "pea" and "rice," fuels that locomotives were not fitted to burn until after 1900. After 1911, soft, bituminous coal, which burned more rapidly if less cleanly than anthracite, was the railroad's primary fuel, with anthracite occasionally mixed in.¹³ Later photos show "SOFT" signs on several chutes, and it is possible that the bottom of

these coal pockets were adapted for holding soft coal because the "angle of repose," i.e., the angle at which coal would flow freely, was steeper for bituminous than anthracite, for which the trestle was originally constructed.¹⁴ It is unlikely that a great deal of coal mixing was done at the Scranton trestle because performing the task in gravity-type coal pockets was difficult, unreliable and time consuming, as one manual on railway management recounts:

While it has been attempted to furnish coal mixed in different proportions at..."pocket-dump" coaling plants, the mixture cannot be made with regularity and in uniformly maintained proportion....Where mixing is unnecessary the most economical results have been obtained in the ordinary gravity-dump pockets.¹⁵

According to this manual, link or belt conveyor coaling stations were much better for mixing, and it is known that, by 1917, the D,L & W had such stations at Gravel Place and Kingston on the Scranton Division.¹⁶ Sand for the Scranton coal trestle, however, because it called for a much lighter and smaller mechanism than did coal, may have been elevated to the trestle-top sand house by a conveyer system.¹⁷

For most railroads, the capacities of coal fueling stations were determined by the number of engines in use, the duration of peak "rush hours" in a yard, and the consistency of availability of coal to the railroad's fueling facility.¹⁸ The first two factors were no doubt of importance in the case of the D,L & W's coal trestle: railroad president William Truesdale (in office 1898-1925) called for peak efficiency and farsighted planning in all the

construction he supervised.¹⁹ The importance of the third consideration is difficult to measure in the absence of original D,L & W records on the subject. Because of its extensive coal land holdings, the D,L & W may not have had to worry about minor strikes, traffic tie-ups, or other logistical problems that plagued non-coal-producing steam railroads.²⁰ The lack of evidence that the coal pockets at Scranton were covered in any way suggests that storage for long periods was not standard practice here.²¹ Steam pipes were run into the pockets to keep coal from freezing solid during cold weather but, because this trestle supplied not only freight and passenger trains passing through Scranton but also several busy yard locomotives, its use was probably constant, and long-term coal storage was unnecessary.²²

The discharging of coal at the trestle was probably done by the fireman on each engine, but there was also a permanent work force on the structure, as is demonstrated by the equipment maintained there: brooms, crow bars, hammers, wheel barrows and a chair are listed in a 1918 inventory, as are a fire bucket and fire house.²³ Because coal spillage was a common problem with the use of bottom dumping hoppers, it is likely that the four scoop shovels on the inventory were used for routine clean-up at the top of the trestle.²⁴ This task was made easier because the Scranton trestle, like others built by the D,L & W, had spaces outside the rails that ran over the coal pockets so that any coal spilled in dumping could be pushed right into the pocket without first being shoveled over

the rails.

Although the D,L & W had a large supply of coal, and the coal in this trestle was not being handled for commercial sale, waste of any kind seems inconsistent with D,L & W management style. The record keeping required at the coal trestle was probably done by a coal-chute foreman, rather than the engineers or firemen taking on coal, because efficient and economic operation of a coal trestle required that some person have an overall awareness of how the facility was functioning. According to a 1913 article titled "Are You Watching the Coal Pile?" a coal trestle foreman had to see "whether some engines are getting all lump coal and some all slack [small fragments of coal]," a problem because gravity pockets naturally let slack fall out first, and whether "handling arrangements for the firemen proper are safe, so as to avoid risk of personal injury in taking coal." Among the many potential problems at the coal trestle that the author points out is also "Favoritism"--unpopular engineers or firemen might deliberately be directed by disgruntled laborers to pockets holding inferior coal.²⁵ It is not recorded that these particular problems afflicted the D,L & W's coal trestle, but it is likely that a supervisor was provided for this active and important facility.

At the time of writing, all that remains of the 1906 trestle are the reinforced concrete approach ramp and pier footings, the wooden portions having been demolished in the early 1950s. Few architectural plans of the Scranton yard trestle exist, but

fortunately the trestle was a popular site for photographing D,L & W locomotives because it stood on relatively open ground in the crowded yards; it appears in the background of many photographs.²⁶ The trestle was a vital part of the yards, and one that apparently gave steady and reliable service. It is representative of steam locomotive fueling stations and processes of the 20th century, and reflects the D,L & W's particular emphasis on facilities that were efficient to build and operate.

NOTES

1. John A. Droege, Freight Terminals and Trains, first edition (New York: McGraw-Hill, 1912), 414.

2. Droege, 429.

3. D.C. Buell, "Are You Watching the Coal Pile?" Railway Age Gazette Vol. 55, No.6 (August 8, 1913), 221.

4. Droege, 415.

5. George T. Hand, "Reinforced Concrete Coal Trestle Pocket," Railway Age Vol. XLII, No.22 (November 30, 1906), 684-686.

6. D, L & W List of Officers, Agents, Stations, Equipment, Facilities, Etc., October, 1917, 63.

7. Delaware, Lackawanna and Western Railroad Company, photograph showing old coal trestle, ca. 1880s, George Arents Research Library, Syracuse University.

8. D, L & W List, 63.

9. Standard Coal Trestle, (plan), Steamtown National Historic Site, Scranton, Pennsylvania.

10. D,L & W List, 63.

11. Interstate Commerce Commission, Inventory Schedule of Structures, Valuation Section 21, Account No. 19, (December 6, 1919), 2.

12. Dimensions and materials for the Scranton coal trestle are based here on existing portions of the structure, photos and a few sections and elevations for this and other D,L & W coal trestles. See note 8.

13. Thomas Townsend Taber and Thomas Townsend Taber III, The Delaware, Lackawanna & Western Railroad in the Twentieth Century, two volumes (Muncy, Pa.: Thomas Townsend Taber, 1980), volume I, 251.

14. Droege, 414.

15.Droege, 416.

16.D, L & W List, 63.

17.Droege, 419-420.

18.Droege, 412.

19.Jules I. Bogen, The Anthracite Railroads (New York: The Ronald Press, 1927), 103.

20.Droege, 468.

21.The Murray Hill Trestle had portable panels to keep its contents dry (Hand, p.685); many contemporary coal trestles were equipped with wooden housings over their pockets (Droege, p.42).

22.I.C.C., "Inventory", 2. In the 1940s, at least four 50-ton coal hoppers were emptied into the trestle's pockets each day, suggesting that even after the railroad's traffic passed its period of peak steam activity in the 1920s, the trestle still did not stand idle. (Leo McClane, former employee of D,L & W, interview by HAER historian, August, 1989, Scranton, Pennsylvania.)

23. Interstate Commerce Commission, "Inventory of Furniture, Tools and Miscellaneous Items", Valuation Section 21, Account No. 19,(June 30, 1918), 131.

24.Hand, 684.

25.Buell, 221.

26.Taber, Vol. 2, 601.

BIBLIOGRAPHY

- Bogen, Jules I. The Anthracite Railroads. New York: The Ronald Press, 1927.
- Buell, D.C. "Are You Watching the Coal Pile?" Railway Age Gazette, Vol. 55, No. 6 (August 8, 1913), 221-223.
- Delaware, Lackawanna and Western Railroad Company. Photograph showing old coal trestle, c. 1880s. George Arents Research Library, Syracuse University
- D,L & W List of Officers, Agents, Stations, Equipment, Facilities, Etc., 1917.
- Droege, John A. Freight Terminals and Trains. First edition. New York: McGraw-Hill, 1912.
- Hand, George T. "Reinforced Concrete Coal Trestle Pocket," Railway Age, Vol. XLII, No. 22 (November 30, 1906), 684-686.
- Interstate Commerce Commission. "Inventory of Furniture, Tools and Miscellaneous Items". Valuation Section 21.
- Interstate Commerce Commission. "Inventory Schedule of Structures". Valuation Section 21.
- "Standard Coal Trestle", (plan). Steamtown National Historic Site, Scranton, Pennsylvania.
- Taber, Thomas Townsend, III, and Thomas Townsend Taber. The Delaware, Lackawanna & Western Railroad in the Twentieth Century. Two volumes. Muncy, Pennsylvania: Thomas T. Taber III, 1980.