

Cultural Resources

▶ Discovering New Jersey's Transportation Past
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Digest

Governor James E. McGreevey

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Commissioner Jack Lettiere

>location:

frankford township
sussex county

>resource types:

bridge

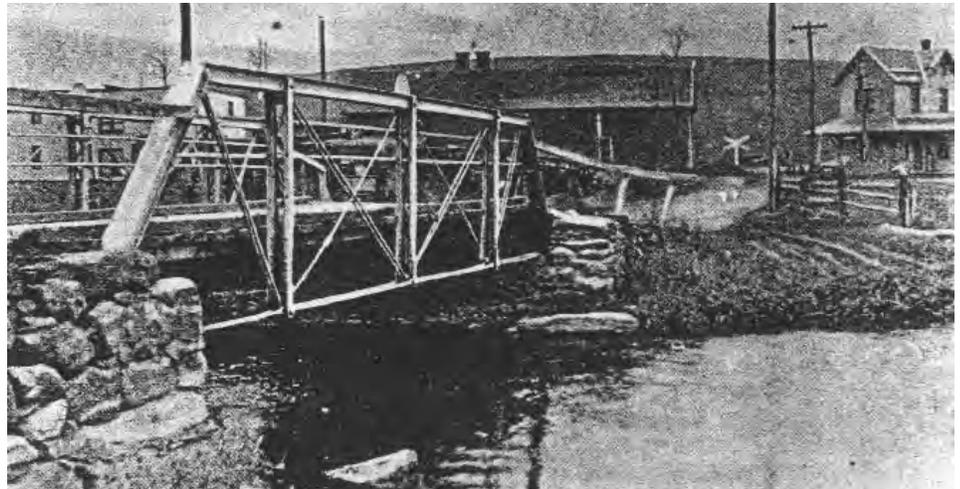
>action:

recording
relocation



The *Cultural Resources Digest*, published by the New Jersey Department of Transportation, summarizes information from professional studies in archaeology, history and historic architecture conducted during the development of transportation projects. Visit us at <http://www.state.nj.us/transportation/works/environment/>

The Augusta Hill Road Bridge: A Second Chance for a Unique Structure



In this photograph, taken around 1910, the Augusta Hill Road Bridge crosses the east branch of the Paulins Kill. The Lehigh and New England Railroad station is in the background [Source: Historic American Engineering Record].

The morning sun emerges from behind Gustin's Inn, casting long shadows across the Morris Turnpike, greeting the horse drawn cart approaching from the west. The wood and iron wheels clatter across the wood deck of the recently constructed bridge spanning the gently flowing waters of the east branch of the Paulins Kill. Dust rises along Augusta Hill Road as the cart continues along on its way, perhaps north to Branchville, maybe south to Lafayette. This is Augusta, New Jersey at the end of the 19th century.

The year is 1886, and the dirt path known as Augusta Hill Road linking the Morris Turnpike and points west had now become more vital with the addition of the Pratt truss bridge spanning the river branch. Erected by the I.P. Bartley Bridge Company

of Bartley, New Jersey, the Pratt truss design was favored for its high strength, low cost and ease of construction, and was the span of choice for a wide variety of crossings. Demanded by locals, supported by transportation companies and approved by bridge commissioners, the Augusta Hill Road Bridge, later also known as Bridge D-7, was in use by the autumn of that year.

One hundred summers and innumerable crossings later, the Augusta Hill Road Bridge had seen better days; the price of progress for the old bridge was paid in increasingly heavy vehicles that slowly battered the structure. Rising and receding floodwaters had tested the supports. The ravages of wind and weather had compromised the once-sturdy bridge. Bridge D-7 would have to be replaced.



This plaque, mounted atop the Augusta Hill Bridge, identifies the builder as the I.P. Bartley Bridge Company of Bartley, New Jersey. The bridge formerly spanned the east branch of the Paulins Kill River, and now resides at the Sussex County Fairgrounds [Source: New Jersey Department of Transportation].

Historic Truss Bridge Preserved at New Location

The farm path known as Augusta Hill Road, a dusty dirt trail through the rolling hills of west-central Sussex County, ends at the village of Augusta, a sleepy hamlet along the Morris Turnpike. Although a station stop on the Sussex Railroad, and later for the Lehigh and New England Railroad, the tiny village remained somewhat isolated from points west until the construction of the Augusta Hill Road Bridge, which spans the east branch of the Paulins Kill.

Prior to the 1886 construction of the bridge, Augusta found early success as a center of commerce. Despite this, it was overshadowed midway through the 19th century when the Sussex Railroad arrived in the neighboring town of Branchville.

Although it experienced a period of decline during the later 19th century, Augusta was still frequented by drovers and farmers, who along with residents and transportation company officials called for the improvement of roadways throughout Frankford Township. Augusta Hill Road was one of those roadways, and the addition of a span across the east

branch of the Paulins Kill would forge an important link in the area's transportation network by connecting the Morris Turnpike with corridors to the west. Constructing a bridge across the east branch of the Paulins Kill would also improve access to several recently completed rail lines criss-crossing the hills to the west of Augusta.

Longstanding plans by the county to improve the road revealed the failure of the bridge (known officially as Bridge D-7) to meet current design standards. Because of this, both the Federal Highway Administration (FHWA) and the New Jersey Department of Transportation (NJDOT) proposed the replacement of the Augusta Hill Road Bridge.

The future of the vintage Pratt truss, the last remaining intact bridge in the state constructed by New Jersey builder I.P. Bartley, became the subject of a collaboration among the various involved parties to rescue and rehabilitate the structure, and today is protected by a preservation covenant. The result of that collaboration ultimately ensured the long-term preservation of, and public access to, this unique structure.

What is a Preservation Covenant?

When individuals or organizations (such as local preservation groups) receive government preservation grants or loans, or outright title to a historic resource, often the recipient is asked to execute a preservation covenant as a condition of receiving the assistance. The covenant protects the public's investment in the property by ensuring that its significant features will be preserved.

A preservation covenant is a binding legal agreement by which the owner, in exchange for the governmental assistance, agrees to preserve the historically important physical qualities of the resource. These significant features are spelled out in the covenant and could be anything

from exterior wood trim, paint color, or even the overall footprint of a building.

Typically a covenant runs for a set time period, such as ten years, depending of the magnitude of the assistance and the significance of the resource. It is recorded with the deed to the property and is binding on future owners until it expires. Usually the other party to the agreement—commonly the agency granting the assistance—has the right to an annual inspection visit, and the right to consult in any changes the owner intends to make to ensure that they will be within the terms of the covenant.

A Village Emerges in Rural Sussex County

Augusta Hill Road meanders lazily through the gently rolling topography of west-central Sussex County, a vital link between the modern-day County Route 519 and U.S. Route 206. For generations the road has served the local inhabitants of the area, a mix of farmers, merchants and tradesmen. The highway passes over the east branch of the Paulins Kill, terminating at the village of Augusta, now a scattering of homes loosely clustered around a rural crossroads.

The overgrown remnants of railroad lines tell of the rising and falling fortunes of Augusta, once the thriving center of Frankford's commercial interests as far back as the early 19th century. Settlement in what later became Augusta began around 1750, when Hugh Hagerty arrived in the area. John Gustin, another early resident of Augusta, purchased Hagerty's land, and in 1795 constructed an inn and tavern on the property. The Gustin Inn still stands and is now a private residence. Gustin had extensive land holdings in the area. He established Augusta's first post office and managed a successful fulling mill, store and ashery. By 1824, Gustin had sold the building to John Bray, who continued to operate it as both an inn and tavern, and also as one of the station stops for the Newark and Owego stage. Prior to his purchase of the inn, Bray worked as a drover and his inn later became a meeting place for drovers passing through the area.

This 1872 atlas shows the approximate location of the town of Augusta, a small hamlet located to the southeast of Branchville. The east branch of the Paulins Kill is south of the Morris Turnpike (now U.S. Route 206). The heavy dark line is the Sussex Railroad [Source: Beers, F.W., "Topographical Map of Sussex County"].



What is a Pratt Truss?

Thomas and Caleb Pratt of Boston patented their truss form in 1844. Thomas Pratt, Caleb Pratt's son, was America's most thoroughly trained bridge builder during the mid-19th century, studying architecture, building construction, mathematics and natural sciences at Rensselaer Polytechnic Institute in Troy, New York. He then worked with the United States Army Engineers before embarking upon a distinguished career as a bridge builder and general engineer for various New England railroad companies.

A Pratt truss is distinguished by its top chord and vertical members acting in compression while its bottom chord and diagonal members act in tension. Pratt's truss design proved superior to the earlier Howe truss, predominantly through its functional distribution of tensile and compressive forces. The Pratt truss achieved enormous popularity due primarily to its strength and straightforward design. The Pratt truss proved adaptable to a wide variety of situations. Its ingenious design and simple structural members did not require complex fabrication details and permitted speedy erection. Pratt truss bridges remained one of the most prevalent bridge types in the United States from 1850 well into the 20th century due to their durability and versatility.

A pony truss, used for lighter loads, allows for vehicles of any height since the two trusses are not connected above the level of the roadway. A through truss is usually taller than a pony truss and can bear heavier vehicles. The trusses of a through truss bridge are connected by overhead cross members.

Much of Augusta's early success can be traced to its proximity to well-traveled roads. Augusta Hill Road comprised a portion of the earliest known roadway within Frankford Township, which connected Balesville in Hampton Township to Deckertown in Wantage Township. Approaching Augusta, it is unclear whether Augusta Hill Road forded or bridged the Paulins Kill at the town, although the road's relative importance may suggest that an early, yet

This 1867 map of Sussex County shows the Sussex Railroad (later the Delaware, Lackawanna & Western Railroad) as it passed through the town of Augusta and continued north toward Branchville [Source: Map of Zinc Mines, Sussex County].



unknown bridge crossed the waterway. The main road through Augusta, the Morris Turnpike (present-day U.S. Route 206), was the earliest turnpike in the area. Completed in 1807, it extended from Long Bridge in Frankford north to Hainsville in Sandyston Township. The turnpike took advantage of a natural cut through the Blue Mountains at Culver's Gap in Frankford, and continued on into Pennsylvania at Milford. The Dover Turnpike merged with the Morris Turnpike less than a mile east of Augusta at Ross Corner, proving advantageous to Augusta's settlement and development.

Augusta expanded principally along the Morris Turnpike, with more sporadic growth along the Plains and Augusta Hill Roads. By the 1840s Augusta, which remained largely an agricultural community, contained a Presbyterian church and 15 to 20 dwellings. The neighboring town of Branchville, located approximately two miles north of Augusta, had by this time begun to eclipse Augusta as the township's residential, commercial and industrial nucleus. First settled in the 18th century, Branchville experienced considerable development beginning in the 1830s, and by the 1840s supported a population of approximately 200 inhabitants. Industries in Branchville during the 1840s included grist- and sawmills, cloth dying and dressing establishments, weaving, cooperage, blacksmithing and cabinetmaking, as well as a carriage

shop. Extension of a railway into Branchville ensured the village's continued dominance of the Frankford Township economy.

During the 1830s, the demand for railroads gripped New Jersey, and Sussex County was no exception. Schemes for the construction of a railroad across Sussex County were proposed as early as 1836, but none materialized until 1848, when a charter for the Sussex Mine Railroad was granted for Cooper and Hewitt's Andover iron mining operations, connecting them with the Morris Canal at Waterloo. In 1852 Newton residents in neighboring Hampton Township petitioned the railroad, renamed the Sussex Railroad in 1853, to extend its line north to their community, which it did in 1854. In 1866 the right of way for the northern extension of the Sussex Railroad through Augusta and into Branchville was secured, becoming operational in 1869. Completion of the railway had a dramatic effect on Branchville, with over 60 new buildings constructed in the town during the next year. Despite the railroad's passage through Augusta, and the erection of a train station there, local development was now firmly centered in Branchville.

Augusta declined rapidly and by 1881 few vestiges remained of the once thriving community. Augusta's wane continued into the 20th century, and by 1901 Augusta's population numbered only 75. The town's only industrial plant, a cream separating business, produced paper sizing from waste curds and converted

they into milk sugar. The plant stood southwest of the Augusta Hill Road Bridge across Augusta Hill Road from the railroad station.

By the early 20th century two railroads served the area; the Delaware, Lackawanna & Western (formerly the Sussex Railroad) and the Lehigh and New England Railroad, which was constructed in 1895

"By the 1840s Augusta, which remained largely an agricultural community, contained a Presbyterian church and 15 to 20 dwellings."

and crossed the old Sussex line at Augusta. Although shrinking during the last quarter of the 19th century, Augusta was still traversed by farmers, who, along with transportation companies, began demanding improved roadways within Frankford Township. Augusta Hill Road played an important role in the area's transportation network as both an access route to the Morris Turnpike and as a through route to Deckertown. Bridging the Paulins Kill along Augusta Hill Road may have been a direct response to the demand for better area roadways.

The I.P. Bartley Bridge Company

The I.P. Bartley Company of Bartley, New Jersey built the Augusta Hill Road Bridge in 1886; a four-panel, steel, half-hip, Pratt pony truss. It is unknown if this bridge replaced an existing obsolete structure or whether it bridged an earlier ford in the river.

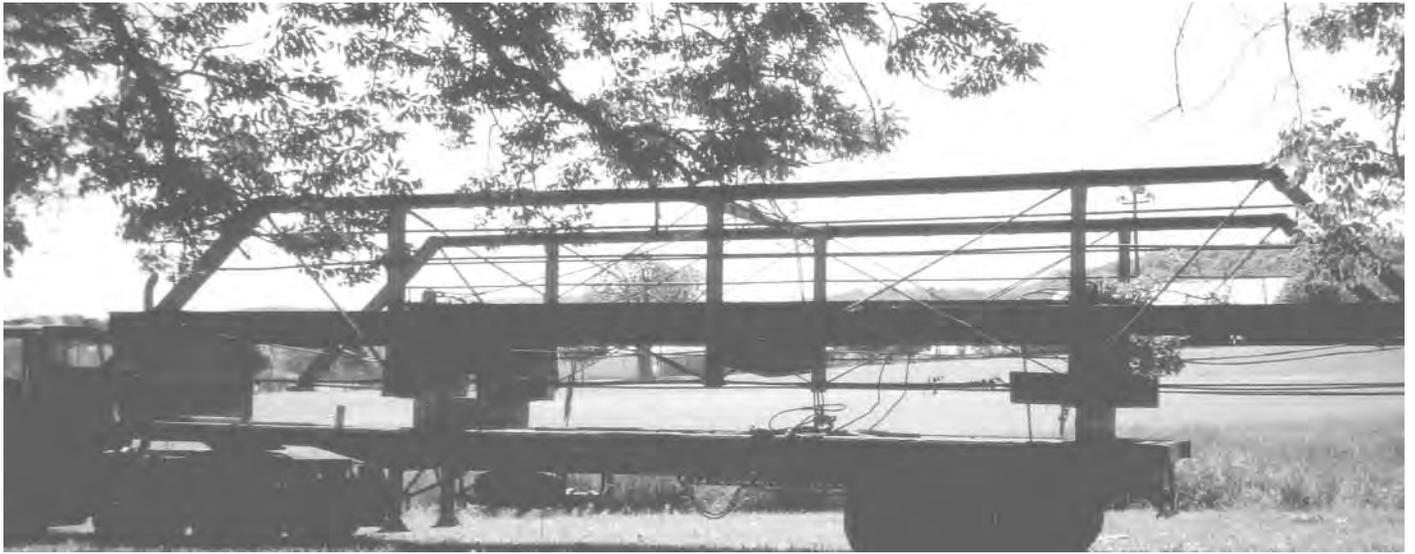
The bridge designer's parent company, William Bartley & Sons, was founded by William Bartley, who established an iron foundry in Bartleyville as early as 1845 under the name Bartley and King. The foundry was later moved to Pottersville, although by 1861 William Bartley had returned to Bartleyville (later renamed Bartley) to begin his own business, locating himself in the iron-rich section of Morris County near the southern border of Mount Olive Township. William Bartley took advantage of local waterpower, constructing his plant along the South Branch of the Raritan River. The Bartley Company's early iron foundry and machine shop manufactured mill castings, machinery and plows, meeting the

conventional needs of both the regional farming and mining communities. By 1882 it expanded to manufacture grist- and sawmill gearing, turbines and waterwheels, iron penstocks, steam engines, portable grist- and sawmills, corn crackers, bark mills and tire breakers. The firm employed approximately 15 men. At this time the town consisted of six houses, a school, a post office and the Bartley foundry.

At least two of William Bartley's sons, Augustus Hugh and Ireaneus P. Bartley, were active in their father's business. Augustus Hugh Bartley joined the firm after graduating from Magie Institute in Chester, New Jersey and later became president of William Bartley & Sons. Ireaneus P. Bartley received a degree in civil engineering from Lafayette College in 1884, and following graduation held a position with an "important bridge concern" in St. Joseph, Missouri. He returned to Bartleyville circa 1886 and joined his father's company as a draftsman and engineer, soon thereafter forming a subsidiary company, the I.P. Bartley Bridge Company, under the umbrella of the larger foundry business. Most of the known I.P. Bartley bridges were constructed within a limited



The Augusta Hill Road Bridge, prior to its removal to the Sussex County Fairgrounds. The Gustin Inn is visible across U.S. Route 206 in the background [Source: New Jersey Department of Transportation].



The Augusta Hill Road Bridge after it was lifted from its abutments by a crane and loaded atop a flatbed truck, ready for transport to its new home at the Sussex County Fairgrounds [Source: New Jersey Department of Transportation].

radius of the company's Mount Olive Township headquarters, extending from Morris County into Sussex and Hunterdon Counties. The rarity of bridges constructed under the moniker of the I.P. Bartley Bridge Company owes to the early passing of its namesake, who reportedly died of heart disease in 1888 at the age of 28.

Constructing an Agreement: A Cooperative Effort to Save the Augusta Hill Road Bridge

For nearly all of its history, Augusta Hill Road had been a dusty, single-lane, dirt track used primarily by the local farmers and residents who worked and lived along its frontage. Planned improvements to the road, which had languished since 1973, began in earnest in the summer of 1990, when Frankford Township began reconstruction of the road. The project created a two-lane paved roadway from County Route 519 to a point southwest of the existing bridge. At the time of the initial reconstruction, guide rails and signage were installed and the approaches to the bridge were temporarily paved for safety purposes.

What appeared to be a fairly straightforward roadway improvement project took an interesting turn

when both the Federal Highway Administration (FHWA) and the New Jersey Department of Transportation (NJDOT) proposed the replacement of the Augusta Hill Road Bridge, citing a failure of the structure to meet current design standards. The single-lane bridge was carrying alternating two-way traffic; it was also subject to overtopping during flood conditions.

An inspection in 1989 had pointed to several glaring concerns: portions of the wood deck showed significant decay. The superstructure exhibited severe rusting; in one case, the material of the upper portion of the bridge was rusted so badly that nearly half of the metal had deteriorated, and many of the fasteners were either loose or missing. A portion of the east truss had been damaged by a vehicle. Support beams showed acute rusting. In addition to this, the concrete abutments displayed significant cracking. All of these conditions were the result of increasingly heavy vehicles and expanding traffic volume, and the future of the bridge seemed bleak.

It was decided during the latter stages of the design process that the roadway improvement project should include a provision for the preservation of the Augusta Hill Road Bridge, citing not only the age of the structure as a consideration, but also the fact that it

“Federal law allows for obsolete historic bridges to be donated to a responsible party if the new owner agrees to preserve it.”

remained as New Jersey's last intact, unaltered bridge constructed by the I.P. Bartley Bridge Company.

Several alternatives were considered, all of which sought to preserve the historic bridge. Doing nothing was not an option; the bridge would not meet current standards, and eventually one of the overweight trucks that used the structure regularly would cause it to fail. Rehabilitation of the bridge in its existing location could have satisfied the weight requirements but would have required extensive modification and reinforcement of the existing structure, thereby changing the original character of the bridge and ruining its historical integrity. The construction of a companion bridge was considered and rejected.

Eventually, it was decided to construct a new bridge and to relocate the existing structure. Construction of a new bridge along the proposed alignment met all of the project requirements, and relocating the historic bridge satisfied the need for preservation. Federal law allows for obsolete historic bridges to be donated to a responsible party if the new owner agrees to preserve it. A *preservation covenant* between the County of Sussex and the Sussex County Farm and Horse Show Association calling for the relocation and preservation of the bridge at the Sussex County Fairgrounds was drawn up and signed. The old Pratt pony truss, which had served

HAER Documentation

The National Park Service, through the Historic American Engineering Record (HAER), sets standards for the documentation of historically important works of engineering. Documentation which meets these standards is called "HAER documentation."

HAER standards, as published in 1990, recognize four main areas of the recording process (content, quality, materials and presentation) and define four levels of detail or intensity of documentation. These levels include a range of approaches from sketch plans, architectural data forms and inventory cards to detailed histories and descriptive materials, large format photography and measured drawings.

Although many types of engineering works have been recorded, including machinery and industrial processes, HAER documentation is often done prior to the replacement of a historic bridge.

Most HAER documentation is on file at the Library of Congress, where it is available to the public. The HAER collection and its companion archive, the Historic American Buildings Survey (HABS) comprise one of the largest archives of their kind in the world. More information on the standards and the collections is available through <http://www.cr.nps.gov/habshaer/haer/>. The collections are accessible at <http://lcweb2.loc.gov/ammem/hhhtml/>.

the people of Frankford Township so faithfully for over 100 years would be cleaned, repaired and painted, and would find new life as a pedestrian-only crossing in a park-like setting.

Prior to relocation, the bridge was documented through a series of photographs with notations for submission to the Historic American Engineering Record (see box) It was then loaded by a crane onto a flatbed truck, in one piece, and moved to its new home at the Sussex County Fairgrounds, where it spans a small stream adjacent to a picnic ground.



The Augusta Hill Road Bridge at its new location at the Sussex County Fairgrounds, now fulfilling its primary role as a walkway across a slow-moving stream. Wood frame railings have been added at either end to facilitate a decidedly more pedestrian function [Source: New Jersey Department of Transportation].

Project: Augusta Hill Road Bridge D-7 Replacement Project
Location: Frankford Township, Sussex County
Date: Winter 1991
Consultant: Harold E. Pellow & Associates, Inc., 17 Plains Road, Augusta, New Jersey 07822-2009

For More Information...

Beers, F.W.
 1872 "Topographical Map of Sussex County" in *State Atlas of New Jersey*. Beers, Comstock & Cline, New York, New York.

Kunz, F. C.
 1915 *Design of Steel Bridges: Theory and Practice*. McGraw-Hill Book Company, New York, New York.

Comp, A.T. and D. Jackson
 1977 "Bridge Truss Types: A Guide to Dating and Identifying." American Association for State and Local History Technical Leaflet 95, History News Vol. 32, No. 5, May 1977.

"Bartley Family"
 Microfiche held by the Joint Free Public Library of Morristown and Morris Township, Morristown, New Jersey.

Honeyman, A. van Doren.
 1927 *Northwestern New Jersey: A History of Somerset, Morris, Hunterdon, Warren and Sussex Counties*. Vol. I. Lewis Historical Publishing Company, New York, New York.

Additional information on transportation projects and historic preservation is available from the Division of Environmental Resources, New Jersey Department of Transportation (<http://www.state.nj.us/transportation/works/environment/overview.htm>), the Federal Highway Administration (<http://www.fhwa.dot.gov/environment/archaeology/index.htm>), the New Jersey Historic Preservation Office (<http://www.state.nj.us/dep/hpo/2protection/njrreview.htm>), and the Advisory Council on Historic Preservation (<http://www.achp.gov/work106.html>).

