

BURNT MILL BRIDGE aka HEADQUARTERS ROAD BRIDGE
OVER TINICUM CREEK, TINICUM TOWNSHIP, BUCKS COUNTY, PA

Historical Assessment Summary

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Resource: Multi-span, rural highway, beam bridge spans 80' over medium sized stream.
Stone sub-structure: **Built 1812**, stone buttress reinforcement west wing wall ca. 1935.
Super-structure: Timber stringer, wooden deck, wooden plank rails 1812 – 1919.
Concrete encased steel I-beams, concrete deck & pylons, pipe rail **1919**.
W-guiderail replaced pipe rail ca. 1990.
Jersey barrier replaced W-guide rail ca. 2001.

Designations: -Ridge Valley Rural Historic, contributing resource listed in the
National Register of Historic Places- applied 1990, listed 1992.
-Lower Delaware **Wild & Scenic River**, contributing resource, 2000.
-Tinicum Creek, PA **Exceptional Value Stream** Designation

Affirmation: Keeper of the National Register's letter of April 26, 2006 states:
"Both its (Burnt Mill Bridge) original construction and alteration occurred within the historic district's defined Period of Significance (1790-1940). The bridge is **historically significant** in the context of the development of the township, regional transportation, and the operation of local mills, and **IS OF ENGINEERING SIGNIFICANCE BOTH FOR ITS EARLY 19TH CENTURY CONSTRUCTION AND ITS SENSITIVE MODERNIZATION IN 1919**. Although the concrete deck shows signs of considerable deterioration and the deck has been altered with the removal of the 1919 railings, the bridge **RETAINS SUFFICIENT HISTORIC INTEGRITY TO CONTINUE TO CONTRIBUTE TO THE RIDGE VALLEY RURAL HISTORIC DISTRICT.**"

PA Historic Bridges: Based on the PA Historic Bridge Inventory conducted in 1993 by Lichtenstein & Associates, Burnt Mill Bridge is the
- **4th oldest bridge in Bucks County** and the
- **11th oldest bridge in Pennsylvania**.
Stone Arch bridges are the only older bridge type.

Bridge Type: Stone supports for a multi-span timber stringer wooden bridge.
- **Burnt Mill Bridge is the oldest documented stone supports for a Multi-span timber-stringer bridge in Pennsylvania**.
While once a fairly common rural bridge type in some areas, timber stringer and deck bridges of the 18th & 19th centuries have nearly disappeared from the entire inventory of historic bridges and often do not even appear as a bridge type. Only one other multi-span stone supported beam bridge is currently known in Bucks County, that of ca. 1835 Harpel's or Creamery Road Bridge over the Tohickon.

Additional Historical Context Categories:

NATIONAL: *Tinicum Township Writer & Artist Enclave of early to mid-20th century*

The majority of Tinicum Township is currently being evaluated for eligibility as a **National Historic Landmark**. Initiated with correspondence with the National Landmark office in 2008, studies are underway to document the area's **unique role as a home to many writers, artists and notables of national caliber during the early to mid-20th century. Tinicum Township retains the integrity of historical landscape and buildings and structures** that were in place during the first half of the 20th century.

Bordering the Delaware River, Tinicum is characterized by a rugged natural beauty secured with historical roots extending back nearly 300 years and evidenced through the handiwork of substantial structures created by the founding families. Building on the framework of ancient roads and buildings of the early Scot-Irish and German families, the agriculturally poor township transitioned into an area of resort and respite by the late 19th century.

The advent of the automobile encouraged writers and artists to settle within the hills and valleys and seek inspiration and quiet renewal, and in some cases to live the thrill of the pioneer lifestyle. With leading names such as S. J. Perelman, Nathaniel West, Dorothy Parker, John Wexley, Artie Shaw, Josephine Herbst and later James Michener, Tinicum became host to a unique blend of generational residents, serious artists and New York sophisticates. The resultant preserved landscape and collection of historical resources is a demonstration of the economic symbiosis between cultures and universal appeal and respect for the natural and historic settings that Tinicum offers. The uniqueness of Tinicum is that the handmade local quality and connection to heritage was retained and sustained, even as artists, notables and sophisticates were added to the demographic.

Headquarters Road is a principal avenue through the township to view and experience this district, and was the visual image that captured the desire of this nationally significant collection of artists to settle here. It retains many of the character defining features of this image, such as winding narrow roads and one-lane bridges.

Burnt Mill Bridge is a critical element of the ability of the township to convey this early 20th century image. It demonstrates both the heritage building traditions and natural stone materials that blended this resource to the landscape, as well as the modest yet effective upgrades in steel and concrete by recognized architect/ engineer A. Oscar Martin to carry modern motorized traffic. It retains evidence of the 1919 appearance wiat was in place upon the arrival of this bohemian trend. Burnt Mill Bridge joins with nearly ten other bridge upgrades (several recently destroyed) Martin executed during this era of renewed prosperity for the township and reinforces the complete physical picture of the 20th century phenomenon.

Additional Historical Context:

NATIONAL: *Architecture & Engineering: Cultural Preferences, Earliest Example*

Burnt Mill Bridge represents a **cultural preference** acceptance of **timber super-structure and stone masonry substructure as a permanent and valid bridge** engineering type by the **predominant German** founding families of Tinicum and upper Bucks County. As a source region for significant westward migrations by the descendants of immigrant first settlers, southeastern Pennsylvania became the trying ground for pure cultural expression, as well as the first cultural blends to both other groups and local landscape offerings of geology and climate. Designs that evolved and design choices made often reflected cultural preferences that ultimately **contributed to the national fabric of construction heritage and practice**. Early examples of building and bridge engineering methods and designs are highly significant to the understanding of the national vocabulary that followed as the 19th century progressed.

Burnt Mill Bridge represents **character defining features of stone masonry supports** that saw principal sourcing and refinement in the early Republic period. Referred to as “pillar bridges” the stone features include large, rough ashlar stone blocks on horizontal courses, diminishing to random stones in height, battered walls to provide the most stable “Pylon” or Pillar, rounded pier noseings to deflect water flows, slightly concave inside facades of abutments to deflect the earthen force of the approach ramps, water tables or a stepped foundation feature. Abutments and piers were placed at roughly 25 foot intervals to support the untrussed wooden timber spans. The Burnt Mill bridge stone supports exhibit these character defining features of this formative period of engineering for these free standing stone support structures.

Burnt Mill Bridge provides **information on the combination of stone and wood** to provide a lasting bridge crossing for over one hundred years until the deck replacement in 1919. Burnt Mill Bridge 1812 provides **the earliest documented evidence of bridges that became commonplace throughout the nation**, design ideas and preferences carried by the very family members of German founding families of this source region. While beam bridges are seemingly “un-engineered”, Burnt Mill demonstrates engineering in the stone supports and the understanding of the design capabilities of wooden beams, thus an **engineered choice with regard to span and placement of piers and abutments**. That this design is repeated in greater scale within 20 years with Harpel’s (Creamery Road) Bridge reinforces both the bridge type and its acceptance as a valid and permanent method of stream crossing. Wooden beam bridges on solid stone supports appear to have been built with more frequency in areas of Bucks County/ southeastern Pennsylvania that contained higher density of German immigrants and their successive generations, areas that sustained a relatively pure cultural imprint even into the 20th century, thereby showing cultural preference in bridge type.

Additional Historical Context:

NATIONAL: *Architecture & Engineering: Cultural Preferences, continued...*

Southeastern Pennsylvania retains pockets of intact settlement areas that represent the variety of cultural groups who arrived to settle under William Penn's Holy Experiment. This event, perhaps the first in the history of civilization that peoples from around the world were invited to live together under a loose Frame of Government, resulted in **successful permanent communities of different cultures** with different architectural and building traditions existing side-by-side.

German migration into Tinicum, to join earlier arrivals of Dutch and Scot-Irish, is verified by requests **in 1738 to form a township**. First and second generation immigrants brought a solid tradition of heavy timber construction and faith in wood as a material of substance and strength. Equally skilled in stone masonry, Germans in Tinicum and other upper Bucks communities accepted timber superstructure bridges on quality, permanent stone supports. This is in contrast to English preferences in southeastern Pennsylvania for full stone, thus the frequency of stone arch bridges in landscapes to the south and southeast, or on major interstate routes. Local artisans John Niece and Barnet Hillpot likely joined with **documented Barnet Snider and Christian Fretz in the construction of Burnt Mill Bridge, adding a true signature of cultural handiwork to the physical bridge**. Local stone and wood artists continued to contribute during technology changes that brought wooden truss covered bridges by the third decade of the 19th century.

While seemingly of local or regional importance, it is these **first permanent expressions of building art and engineering that established the nation's building traditions as well as provided the physical underpinnings of the creation and growth of the nation**. Only one other stone supported multi-span timber-beam bridge (again with ca. 1935 concrete deck) known to exist in upper Bucks County is the nearby 200 foot Harpel's aka Creamery – Fretz Valley Road Bridge. This bridge shares regional, cultural, engineering and familial associations with Burnt Mill Bridge. To view period historic bridges side-by-side with the stone homes of these founding families (in this case the Fretz's, Christian & Abraham and the Harples) gives a rare and unique glimpse of the very basic foundation of our nation.

A national bridge assessment study "A Context for Common Historic Bridge Types" prepared in 2005 (Parsons Brinckerhoff and Engineering and Industrial Heritage, National Cooperative Highway Research Program &c), while well-written and very comprehensive on truss types, provides minimal information on the timber stringer with stone supports, generally focusing on timber bridges with timber pylon supports and 20th century picturesque park-type timber bridges (representative examples given are of the latter). It does acknowledge the commonality and frequency of the type, especially for short, single spans, and the duration of use into the 20th century.

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Additional Historical Context:

NATIONAL: *Architecture & Engineering: Cultural Preferences, continued...*

The report notes that **timber bridges were among the earliest**, as “stone bridges were expensive and time-consuming”. It infers that these “bridges were all of a temporary nature”. This misunderstanding comes perhaps from a lack of information about these very early bridges, due in part to their rarity today, as well as a lack of understanding of the significance of the stone supports to verify the existence of a wooden structure and the local achievement to build a bridge. The report does qualify the limitations of its study and the need to gather more information on timber bridges.

The Burnt Mill Bridge, as the oldest documented bridge of its type in Pennsylvania, along with Harpel’s Bridge demonstrate sophisticated design of the stone supports, application for county assisted funds to construct the stonework, and acceptance of a timber beam deck as a permanent bridge by the locally dominant German population. The study does state that “very old (pre-twentieth century) examples would possess significance as an early representative example of the type if they retain integrity. In the case of Burnt Mill, the stone substructure retains very good integrity from its original engineered design, and clearly demonstrates the span capability of the wooden beam, namely 25 feet. Even without the original timber beams, the number and spacing of the stone supports provides clear evidence of the design and span. Documentation drawings rendered by A. Oscar Martin in the early 20th century (collection @ Bucks County Historical Society) for a similar bridge, now destroyed, provide measured specifications for the wooden super structure, including the wooden beams, board deck, wood railing and wrought iron nails to attach the railing. These drawings “complete the picture” of the design of the wooden superstructure assuming similarities within the same county, geographic setting and cultural group. **Thus Burnt Mill Bridge stands as a significant verification of a forgotten bridge type, and by age and size, may have provided a prototype for migrating cultural groups from Bucks County to repeat as settlement moved across North America.**

NATIONAL: *Engineering: Wooden Bridge Technology*

Burnt Mill Bridge contributes to a unique collection of wooden bridges in Tinicum Township that is exemplary on a national scale in representing some of the **oldest and most diverse variety of bridge types**. Burnt Mill 1812 and Harpel’s Bridge ca. 1835 verify wooden beam technology, there is one ca. 1835 Queen Truss pony bridge over the NHL Delaware Canal, one ca. 1867 Howe open pony wooden truss of multi-span, three ca. 1850-1880 covered Town or lattice trusses and one ca. 2005 Burr truss replication of the original 1832 Delaware Canal aqueduct over the Tohickon Creek. The majority of these bridges are located either in National Register Historic Districts, over National Landmark designated canal or within State Park boundaries, designations which help to reinforce the physical context for understanding the choice of wooden bridges.

KAA/2013

Additional Historical Context:

NATIONAL: *Engineering: Collection of Rural Bridge Types*

Tinicum Township's collection of bridges (including those crossing the Tohickon into other townships) is one of **the most comprehensive in the state and represents all major rural bridge types**. Included are natural stream fords (three active), supports for wooden beam spans (two active), stone arch (one active), covered wooden Town truss bridges (three active), open wooden Howe truss (one), open wooden Queen post pony (NHL-one pedestrian), metal truss (one active King Iron Company bow string, four active Pratt pony), concrete deck girder arch- 1909 (one active), early concrete encased I-beam (five active), early solid concrete deck (at least three active), early concrete barrel arch long span- 1922 (one active), ca.1930 balustraded concrete T-beam long span (one active), ca. 1930 paneled parapet concrete T-beam single span (two active), mid-20th century early park-era crossings of the Delaware Canal (NHL) (four active). Additionally of interest is the reconstructed timber Burr truss aqueduct for the canal over the Tohickon Creek. This collection has rare wrought iron, one-of-a-kind open wooden truss designs, as well as some of the earliest examples of concrete technology. Burnt Mill is critical by both age and type to complete the full picture of rural bridge technology that this remarkable collection represents.

Unfortunately, a significant steel plate girder bridge- 1921 over the Delaware Canal, was recently completely destroyed and replaced. Likewise several early 20th cent., single span, one-lane concrete and I-beam spans were inappropriately replaced with intrusive modern bridges that altered stream characteristics, natural setting and serenity and historic road paths and degraded NR historic districts. In spite of these recent mistakes, this collection of nearly 34 historic bridges of all types (except plate girder) provides perhaps the most comprehensive representation of rural bridge solutions in preserved visual and historical context in the country. **The Burnt Mill Bridge is a critical component as the oldest bridge and representing the oldest type (save natural ford) of engineered crossing in this collection.**

REGIONAL AND LOCAL: *Patterns of History, Development & Transportation:*

Burnt Mill Bridge verifies by its placement the original path of the ca. 1747 Headquarters Road as a critical path to the only internal mill in the township, first Henry Myers' then Christian Fretz', as well as the regional path for travelers coming across from the Perkiomen (Goshenhoppen) Region to the Erwin's ferry crossing to New Jersey on the Delaware. Once the bridge was built in 1812, connecting roads, Red Hill and Sheep Hole were confirmed to facilitate this critical transportation artery.

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Additional Historical Context:REGIONAL: *Community Development: Bucks County in the Early Republic*

Burnt Mill Bridge represents the significant growth and maturity of the County of Bucks during the Early Republic period, namely the capability of the young government to fund major construction projects including inter-state bridges, the county almshouse and a new set of county buildings built in conjunction with the relocation of the county seat from Newtown to Doylestown 1812. By its remote location 12 miles from the county seat in Doylestown Burnt Mill Bridge represents the effective outreach of the county system to meet the needs of its rural populations. It also represents the ascension of cultural groups that had been in the political minority, but now who were playing strong roles in the growth of the county, including the Stovers and the Fretz families, both very instrumental in the county court house and almshouse building projects.

REGIONAL: *Community Development: Local Craftsmen to carry out Public Projects*

Burnt Mill Bridge represents the southeastern PA approach to bridge building projects, namely that bridges were built by the local population of artisan and property owners, with an account of funding placed in charge of a neighbor to the chosen bridge site. Thus Bridges take on a hand-made quality with distinctive characteristics of the stone masons and carpenters who also constructed the houses and barns in the community.

NATIONAL/ REGIONAL: Architecture/ Engineering, significant AOM

(detailed discussions)

NATIONAL- *Architecture & Engineering: Cultural Preferences.*

Southeastern Pennsylvania retains pockets of intact settlement areas that represent the variety of cultural groups who arrived to settle under William Penn's Holy Experiment. This event, perhaps the first in the history of civilization that peoples from around the world were invited to live together under a loose Frame of Government, resulted in successful permanent communities of different cultures with different architectural and building traditions existing side-by-side. German migration into Tinicum, to join earlier arrivals of Dutch and Scot-Irish, is verified by requests in 1738 to form a township. First and second generation immigrants brought a solid tradition of heavy timber construction and faith in wood as a material of substance and strength. Equally skilled in stone masonry, Germans in Tinicum and other upper Bucks communities accepted timber superstructure bridges on quality, permanent stone supports. This is in contrast to English preferences in southeastern Pennsylvania for full stone, thus the frequency of stone arch bridges in landscapes to the south and southeast, or on major interstate routes. Local artisans John Niece and Barnet Hillpot likely joined with documented Barnet Snider and Christian Fretz in the construction of Burnt Mill Bridge, adding a true signature of cultural handiwork to the physical bridge. Local stone and wood artists continued to contribute during technology changes that brought wooden truss covered bridges by the third decade of the 19th century.

While seemingly of local or regional importance, it is these first permanent expressions of building art and engineering that established the nation's building traditions as well as provided the physical underpinnings of the creation and growth of the nation. Only one other stone supported multi-span timber-beam bridge (again with ca. 1935 concrete deck) known to exist in upper Bucks County is the nearby 200 foot Harpel's aka Creamery – Fretz Valley Road Bridge. This bridge shares regional, cultural, engineering and familial associations with Burnt Mill Bridge. To view period historic bridges side-by-side with the stone homes of these founding families (in this case the Fretz's, Christian & Abraham and the Harples) gives a rare and unique glimpse of the very basic foundation of our nation.

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NATIONAL: *Tinicum Township 20th century Writers' & Artists' Enclave,
National Historic Landmark*

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