

CITY COUNCIL REPORT

TUFA BRIDGES - HISTORIC NOMINATION STAFF REPORT

Name of Property	Tufa Bridges
Address of Property	Schenley
Property Owner	City of Pittsburgh
Nominated by:	Matthew Falcone
Date Received:	20 July 2017
Parcel No.:	27-S-150
Ward:	14th
Zoning Classification:	Park
Neighborhood	Oakland
Council District:	5 – O'Connor

FORMAL ACTION REQUIRED BY THE HISTORIC REVIEW COMMISSION:

- 1. Act on the Preliminary Determination of Eligibility for Historic Designation (2 August 2017)
- 2. Conduct a public hearing for the Historic Designation (6 September 2017)
- 3. Review the Report prepared by staff for the property in question, and make a recommendation to the City Council on the Historic Designation (6 September 2017)

FORMAL ACTION REQUIRED BY THE PLANNING COMMISSION:

- 4. Conduct a public hearing for the Historic Designation (24 October 2017)
- 5. Review the recommendations of the Historic Review Commission and make a recommendation to the City Council on the Historic Designation (7 November 2017)

FORMAL ACTION REQUIRED BY THE CITY COUNCIL:

- 6. Conduct a public hearing
- 7. Review the recommendations of the Historic Review Commission and the City Planning Commission and take action on the Historic Designation

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FACTS

1. On July 20, 2017, the staff of the Historic Review Commission received an application for the nomination of the Tufa Bridges to be designated as a City Historic Structure.

2. Description of the Tufa Bridges (as extracted from the nomination form)

The Tufa Bridges of Schenley Park are large reinforced-concrete bridges with a unique stone facing known as Tufa. Two tufa-stone bridges extend over a gulch to curve and connect the Lower Panther Hollow trail. The gravel-covered trail on the bridges' deck was originally intended as a bridle path for the equestrian communities nearby. They are separated by nearly a mile along the winding trail and differ by arch; the elliptical arched or upper run bridge is located near Schenley Park Visitor's Center over Phipps Run and the semicircular arched or lower run bridge is located near Serpentine Drive and Barlett Playground.

The closed-spandrel arch bridges are imagined in the rustic style to give an organic appearance rather than manmade, in the midst of hillsides and wide variety of prehistoric vegetation. Each barrier end of the bridge is encapsulated by a turret-like structure, measuring close to 3.5 feet. The arches gradually form from massive abutments of tufa-covered concrete in the surrounding hillside. Technically, the arch beneath is called a culvert barrel, which is defined as a structure that allows water to flow under a road, trail, or similar obstruction.

Ravines underneath the Tufa bridges run alongside lower bridle paths, as one was reconfigured a year after the completion of the main mile-long bridle path. The Post-Gazette writes a small description of the elliptical arched bridle path as: "A new curved walk... from the new smaller lake right up the Little Panther ravine [Phipps Run], passing under the picturesque tufa-stone bridge over which the bridle path crosses the gulch. This path leads up to the lily pond, which lies 75 feet higher, just around the bend in the road south of Flagstaff hill."

The upper run bridge is considered the most frequently used given the trails above and below the archway as well as the hollow run trail steps leading to Schenley Park Visitor's Center. The breadth of this elliptical arched bridge stretches 105 feet on the north side of the curve and 101 feet on the south side. The north side of the archway measure 15 feet in height and gradually slopes downward to yield 16.4 feet on the southern side. Near Serpentine Drive, the lower run bridge is larger in length, as the breadth is nearly 130 feet along both sides of the curve. The semicircular archway is about 17 feet tall and 50 feet wide on either side of the curve.

3. History of the Tufa Bridges (as *extracted from the nomination form*)

The stone bridges were the imaginative product of George W. Burke, Superintendent of City Parks for the Department of Public Works, who believed the bridge's utilitarian function could surface as a picturesque feature of the Victorian-era style of Schenley Park. Burke chose the bridge locations for the "deep, shady place... that in a course of a few years mosses and lichens will cover the stone and make the bridge look very picturesque."

After a \$220,000 bond issue was given for the unemployed by the City of Pittsburgh, the bridle path construction was reported to begin on March 10, 1908. George Burke oversaw the eight-month endeavor to be a new picturesque route for equestriennes and an accessible one for those who could not traverse the Panther Hollow by foot. The location of the Tufa Bridges was necessary in order to extend the bridle path across the steep hillsides and Nature Ravine, or Phipps Run. It is noted in a Pittsburgh Daily Post article that the "rustic bridges spanning the ditches will be torn down and replaced with structures of the same pattern but on a more elaborate scale," indicating that the current Tufa Bridges may have started or finished construction late into 1908 or early spring 1909, after the bridle path was completed. Similarly, a Post-Gazette article from December 1908 stated the "two new rustic bridges will take place of the two old ones." On the contrary, a Post-Gazette article in August 1908 also describes the "ancient-looking" bridge at the upper end of Panther Hollow as a "not yet completely finished" structure. Photographs from November 1908 prove that the incomplete structures were likely to be the rustic, wooden bridges within the Lower Panther Hollow, many of which have been replaced by the Works Progress

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Administration (W.P.A.) bridges in the mid-1930s. By whatever means, the bridges were finished in early 1909 and greeted with immense enthusiasm by local communities, as described in various local newspapers.

- **4. Significance of the Tufa Bridges** (as extracted from the nomination form)
 - The Pittsburgh Code of Ordinances, Title 11, Historic Preservation, Chapter 1: Historic Structures, Districts, Sites and Objects lists ten criteria, at least one of which must be met for Historic Designation. The nominator is of the opinion that the Tufa Bridges meets several of the criteria as follows.
 - 2. Its identification with a person or persons who significantly contributed to the cultural, historic, architectural, archaeological, or related aspects of the development of the City of Pittsburgh, State of Pennsylvania, Mid-Atlantic region, or the United States;

George Burke is identified as the sole imaginor of the Tufa Bridges and the main contributor to their existence in Schenley Park. As an early superintendent of Pittsburgh Parks and Phipps Conservatory, his role in their development and function is highly significant. From the articles provided below, he is neither an architect, engineer, builder, nor designer by trade, but rather a horticulturist and city official.

George Burke entered employment by the City of Pittsburgh as a park foreman in 1890. He was also appointed superintendent for Highland Park in February 1894 (officially), when he took over the role of park superintendent from Jim McKnight (and temporary successor A. W. Bennett). In the fall of 1901, Bigelow removed Burke from his job in order to consolidate the parks superintendent position and centrally locate it within Schenley Park (William Falconer held that position at that time). There was also a major political shakeup with Magee, Flynn, and Bigelow resulting in Bigelow's removal from office from 1900 to 1903. When Falconer left the position in 1903, Burke was re-hired to take his place. Also, July 1, 1903 marked the date when the parks were set up as a separate bureau of the Department of Public Works. A Pittsburgh native, Burke was born on January 24, 1863 and known to be an avid horticulturist.

He was educated in Pittsburgh public schools and his professional demeanor was looked highly upon by Director Bigelow, especially concerning the 1894 appointment as "a man who has been one of us, who has lived among the people for a good term of years, and who knows a thing or two about this place, to take charge of Schenley Park... [we] require a specialist, and a good one, to run the conservatory."

From his appointment as park superintendent, it was Burke's duty to oversee Phipps Conservatory and Schenley Park. He also had high responsibilities within Highland Park Zoo, according to a 1905 article summarizing the securement of another elephant and Burke's oversight with the 1899 financial expenditures for both the park and zoo, totaling \$86,725.94.

He seemed to fill his position to the highest standard by "drawing thousands of visitors from all parts of the country for his flower shows." A Pittsburgh Press article from September 25,1906, remarks how the upcoming annual Chrysanthemum exhibition would be "one of the finest that the conservatory has ever had" with nearly five thousand Chrysanthemum flowers planted. Many other flower shows, such as the Phipps Easter show and winter exhibition, were regarded with much approval by the press and praised Burke for their well-reception.

Given Burke's well-regarded work, the press published many articles during the turn of the century because of the enthusiastic and success reception of park visitors. Pittsburgh Daily Post published an article entitled "Superintendent Burke Plans Many Improvements to Beautify the City Pleasure Grounds [Phipps Conservatory and Schenley Park] Next Year," that summarizes the floral embellishments Burke plans within Schenley Park. A 1906 Pittsburgh Press article raves about the planted bulbs for the Annual Phipps Easter display as well as the entire renovation of Phipps Conservatory, including the already-finished palm and fern houses "rearranged and the undergrowth replanted." The present-Palm Court and Fern Room are believed to be the product of Burke's renovations from early 1906. The curiosity about these rooms is their natural display imitates the conditions of primitive and botanical plants' place of origin with, for example, large stone and gravel beds that should be organic in texture and well-drained.

These large stones throughout the right wing of Phipps Conservatory are also known as Tufa rocks, of which their particular origin is unknown.

Burke's career was respected through the credited and well-received improvements to Schenley Park and Phipps Conservatory. The author, Howard Stewart, best summarizes Burke's work:

"During Burke's administration, there were many new parks acquired and many improvements made in the existing parks. Picnic shelters, tennis courts, a golf course, new roads, trails, bridles paths, walks and walls were constructed. As a matter of fact, everything that we had in the parks until 1934 was completed under Burke as Superintendent."

Sadly, his career came to end on March 25, 1926 when Burke committed suicide by gun in his office at Phipps Conservatory in the early hours of the morning. He was found by a fellow colleague, A. J. Stevens, who reported hearing the gunshot and finding Mr. Burke with revolver in hand and a small wound in the side of his skull. His suicide is attributed to a nervous breakdown the year before in October 1925, from what exactly is unknown. He died at the ageof 64 and was survived by his wife Alice Harper Burke and two sisters.

3. Its exemplification of an architectural type, style or design distinguished by innovation, rarity, uniqueness, or overall quality of design, detail, materials, or craftsmanship;

Construction

The tufa bridges are significant in their construction, given the practices of the time period. An article from the Pittsburgh Post-Gazette contains the best description of how both bridges were made:

"The main body of the bridge is composed of concrete, reinforced with steel rods. Before the concrete was poured, a frame was erected and the tufa was built up, not being visible from the outside, as it was covered with the broad frame. The tufa supported by the frame formed one side of a mold into which to pour between the two. Another frame was put up, and the concrete was poured between the two attaching itself firmly to the back of the tufa. After the concrete had hardened the boards were taken down and the tufa facing left exposed. It is believed to be the only bridge of this kind in the world."

This description is typical of reinforced concrete arch bridge construction during the early twentieth century. As the author noted, a bridge of this type would be cast in place. First, the abutments, or ends of the bridge, would be cast simultaneously, then a falsework or frame would be constructed followed by the placement of steel bars. Within the falsework, the tufa would be carefully assembled to form the exterior of the bridge. The tufa would become an integral to the bridge when the concrete combined with the structure. The structure would dry and the falsework would be removed in order to appear as it does today.

While most American engineers were familiar with concrete reinforcement by about 1870, it took another thirty years of experimentation before engineers and builders had a thorough understanding of its capabilities and versatility in construction. By 1905, the standard term for most types of reinforcement systems became known as reinforced concrete. This standardization was due in part to a number of publications using the aforementioned term. An example of one such publication would be the detailed work by concrete specialists and civil engineers, Albert Wells Buel, and C.S. Hill. Meant for those within the construction industry, this book became a widespread success to the engineering community, following the American practice and utilizing convenient classification. Buel's expertise surfaced in a local engineering project from 1911: Sewickley Bridge. The current bridge is the second to occupy the site as of October 21, 1981. During the construction of the first bridge, according to the Historic AmericanEngineering Record, Buel was "hired as a private consultant especially for this work, and afterward retained, as a consulting engineer." His association with Allegheny County and renowned expertise was prevalent by the work expressed by the bureau of construction, led by N.S. Sprague.

Once engineers grasped the capabilities of reinforced concrete, bridge technology experienced a renaissance of arch construction within the United States. The variety of arch types is exemplified by the designs of Daniel B. Luten, whose patented bridges were built throughout the eastern and Midwestern United States. The new material allowed arch bridges to be constructed with ease financially and physically. The load-bearing capacity of the form remained the same with lesser material triumphing over additional mass. It is curious to note that the renaissance of the arch bridge coincided with the City Beautiful movement, a turn-of-the-century urban planning initiative to construct municipal structures that were aesthetically pleasing yet still functional. Gracefully curved arches and ornamented concrete parapets also reflected the early twentieth century promotion of City Beautiful ideas and goals among urban planners and engineers. The efforts of George W. Burke and other municipal idols within Pittsburgh parks during that time would be considered proponents of the City Beautiful movement.

Material

Tufa is a calcium carbonate precipitate occurring near fresh, ambient water. The chemical composition is abundantly CaCO₃ (chemical formula for calcium carbonate) and can contain a small percentage of either magnesium carbonate (MgCO₃) or iron. This particular type of carbonate deposit is related to travertine, limestone, and marl layers. In Ohio, tufa is frequently associated with marl and can be used interchangeably to describe each other. The actual etymology of the name tufa derives from a similar type of rock used in Roman architecture called tuff. Yet, both rocks are actually quite different in origin and formation.

Newly quarried tufa is nearly white with an open porous texture, analogous in form to volcanic pumice. The fragile stone can easily weather throughout time to form a rustic appearance among a conglomeration of microtubules and nodules. Sometimes the rock can be encrusted with twigs, small pebbles, or wetland plants depending on the origin of formation.

According to the Ohio Geological Survey, calcareous tufa differs from most ancient sedimentary and bedrock sites because it is actively being formed from supersaturated groundwater. In fact, the tufa bridges feature small and nearly inconsequential mounds of minerals formed by the slow, constant drip of rainwater through the stone cladding. These mineral deposits appear as cavern stalactites (formed from suspended soluble materials) and stalagmites (formed from floor accumulations of soluble material), but technically are named travertine. This meteogene or weather-formed travertine derives from ambient water rather than hot spring or thermogene travertine.

The tufa bridges have weathered in time from nutrient-voracious plants as Burke expected, however, most of the stone cladding is unnaturally black. Mike Angle, a geologist from Ohio familiar with tufa, concurs in the belief that Pittsburgh's problem with coal dust in the mid-twentieth century resulted in an abnormal absorption. Moss and lichens thoroughly covering the uppermost part of the bridges also result in darkening of the stone. Another plausible theory from Angle is that the stone's composition results from a chemical change over time. Such as the reddish brown appearance of stones results from iron oxidation, a black appearance may result from manganese oxidation. Minor quantities of manganese are present in most sedimentary rocks in Ohio.

The porous, lightweight, and substantially pure calcite precipitate is considered fairly unique to other limestone derivatives in Ohio. Horticulturalists and geo-enthusiasts have picked up on the water retentive qualities of tufa as a dependable feature of rock gardening. The overabundance of calcium carbonate (90 to 99 percent) is substantial to alkali and lime-loving plants. Although tufa is found in other parts of the world, such as west coast America and Europe, Ohio is rather important for geological sites nearly pure in calcium carbonate.

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5. Integrity

The Tufa Bridges remain in the same location as they did in 1908, with minor alterations. Today, the Schenley Park improvements and Tufa Bridges still create a place that seems far removed from city life, as described by many park enthusiasts. This idea of returning to nature is integral to the original intentions of George W. Burke.

The last noted field check of the Tufa Bridges was recorded October 1, 2000. In February 2010, an article entitled "Rebuild the Walls," featured on the Pittsburgh Parks website, elaborated on the collapse of a historic wall behind Schenley Visitor Center after the then-recent rainstorm. Pittsburgh Parks subsequently tackled a repair project given the \$3.02 million grant for the improvement of trails in all parks after years of rain and erosion of the subsoil hillsides. It was reported that Venture Outdoors and other recreational group frequently use the trails and bridges, so maintenance was required of those affected by rain and erosion.

The Tufa Bridges were given special consideration in February 2010 by Allison Park Contractors, who were hired to order new tufa to replace some lost or damaged pieces. Some pieces were also inspected by the sounding of rock by a rubber mallet to ensure the rock is stable and does not need to be re-adhered. The new tufa would be cleaned to match the old material and hopefully start to weather over time for fluid visual character. Areas of deteriorated tufa-stone were located on the barriers, abutments, and archway underneath. In addition, an August 2010 article noted that the Phipps Run stream channel underneath the upper run bridge would be redirected to handle a large catch of water towards the lake, another site of work amongst the Tufa Bridge.

As described, the Tufa Bridges of Schenley Park have had some minor repairs to the stone facing in the past. The unstable stone facing was replaced with new Tufa imported from the British Columbia territory in Canada, rather than the original Ohio deposits. The replacement stone is visible by the white color and the surrounding repointed mortar. Few parts of the bridge are missing the Tufa stone altogether, leaving the concrete or mortar backing exposed. There is no evidence of structural damage or future structural repair work planned, given the safe and sound integrity of the bridges. There is some minor defacement to the concrete abutment of the lower run bridge, which is starting to wash away.

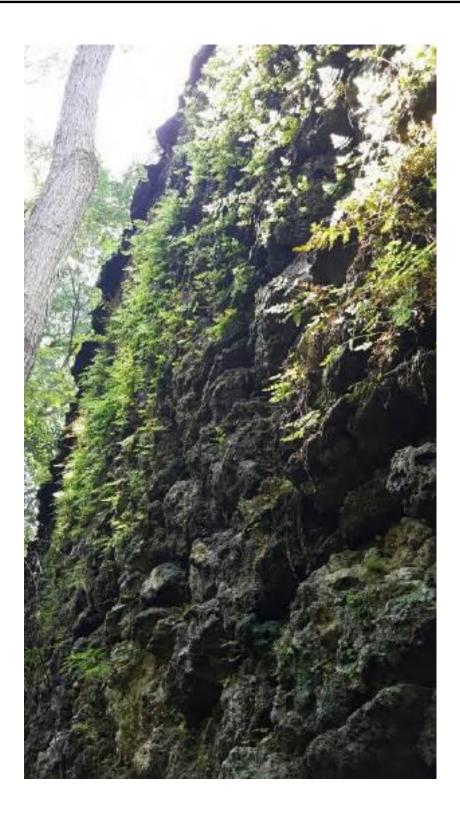
6. Photos



Tufa Bridge 1

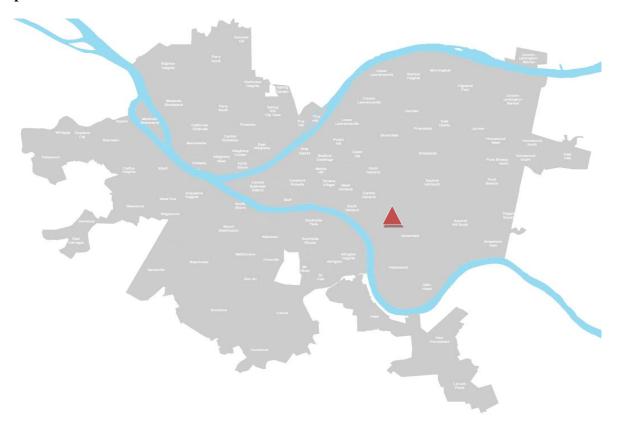


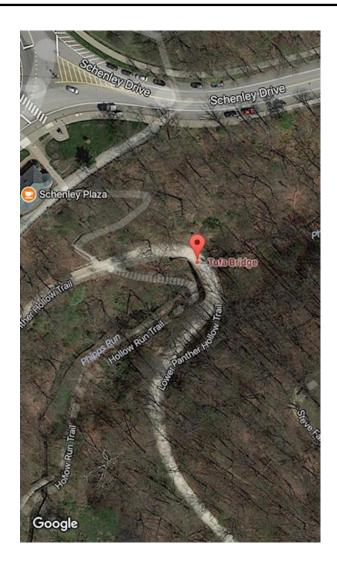
Tufa Bridge 2



Tufa Bridge 2

7. Maps





Tufa Bridge 1



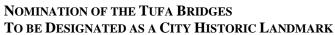
Tufa Bridge 2

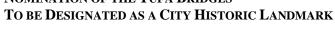
8. Recommendation of the Historic Review Commission

The Historic Review Commission held a public hearing regarding the designation of the Tufa Bridges. On September 6, 2017 the Commission voted to recommend to City Council that it designate the Tufa Bridges as historic

9. Recommendation of the City Planning Commission

The City Planning Commission held a public hearing regarding the designation the Tufa Bridges. On November 7, 2017 the Commission voted to recommend to City Council that it designate the Tufa Bridges as historic.







HRC MINUTES - AUGUST 2, 2017 - PRELIMINARY DETERMINATION HEARING

Pittsburgh HRC – August 2, 2017

Tufa Bridges Schenley&Serpentine Drives

Historic District Nomination

Owner: Ward: 14th

City of Pittsburgh

Lot and Block:

Inspector:

Nominator:

Matthew Falcone Council District:

Nomination Received: 7/20/17

National Register Status: Listed: X Eligible:

Proposed Changes: Nomination for historic designation.

Discussion:

- 1. Ms. Quinn makes a brief presentation on the bridges. She states that there is a lot of information in the nomination including several criteria for designation, which she states she will need the Commissioners' help in narrowing down to one strong, well-documented criterion. She finds that the strongest criterion is **Criterion 3**, exemplification of an architectural type, style or design. She states that the nomination also mentions Criterion 4, identification with significant person or persons, but she would like the Commission to take a look and see if they find that appropriate.
- 2. The Commission discusses the criteria for designation.
- 3. Mr. Hogan states that their task today is to determine that the application is complete and meets at least one of the criteria for historic designation and to set a date for a public hearing and final determination.
- **4.** Mr. Serrao states that the only other criterion he could see is **Criterion 10**, unique location and distinctive physical appearance or presence.
- 5. Mr. Hogan recommends that they accept the application, noting that the nomination meets **Criteria 3 and 10** at a minimum, and have the application proceed to the September hearing for public comment, and noting that the bridges are now protected until City Council's final vote.

Motion:

- 1. Mr. Serrao motions to accept the application as complete and at least meeting one if not two of the criteria for designation.
- 2. Ms. Peterson seconds.

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3. Mr. Hogan asks for a vote; all are in favor and motion carries.



HRC MINUTES – SEPTEMBER 6, 2017 RECOMMENDATION

Pittsburgh HRC – September 6, 2017

Tufa Bridges Schenley&Serpentine Drives

Historic District Nomination

Owner: Ward: 14th

City of Pittsburgh

Lot and Block:

Inspector:

Nominator:

Matthew Falcone Council District:

Nomination Received: 7/20/17

National Register Status: Listed: X Eligible:

Proposed Changes: Nomination for historic designation.

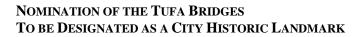
Discussion:

- 6. Ms. Quinn states that last time she recommended that the nomination be considered significant under **Criterion 3**, exemplification of an architectural type, style or design, and she asked the commission to consider other criteria.
- 7. Mr. Serrao states that the only other one he considered was **Criterion 10**, unique location and distinctive physical appearance or presence, but he agrees on 3.
- 8. Mr. Hogan asks for public testimony.
- 9. Ms. Alayna Jordan steps to the podium; she was the preparer of the nomination. She addresses some of the criteria she chose for significance including **Criterion 2**, identification with a person or persons who significantly contributed to the cultural, historic, architectural, archaeological, or related aspect of the development of the City of Pittsburgh.
- 10. Mr. Hogan states that they need to determine that the nomination meets the standards and to move it on to Planning Commission and City Council.

Motion:

- 4. Mr. Serrao motions to accept the nomination as complete and meeting at least one minimum criteria, which is **Criterion 3**, exemplification of an architectural type, style or design, and possibly **Criterion 2**, identification with a person or persons who significantly contributed to the cultural, historic, architectural, archaeological, or related aspect of the development of the City of Pittsburgh. He recommends that City Council approve the nomination under the guidelines that require it to meet at least one criteria, which is **Criterion 3**.
- 5. Mr. Harless seconds.

6. Mr. Hogan asks for a vote; all are in favor and motion carries.



PLANNING COMMISSION MINUTES – NOVEMBER 7, 2017

C. <u>DEVELOPMENT REVIEWS</u> (See Attachment B for staff reports.)

1. <u>Hearing and Action</u>: Historic Nomination: Schenley Park Tufa Bridges

Ms. Quinn made a presentation in accord with the attached staff report

Ms. Quinn presented information on the Tufa Bridges of Schenley Park. The bridges are large reinforced-concrete bridges with a unique stone facing known as Tufa. Two tufa-stone bridges extend over a gulch to curve and connect the Lower Panther Hollow trail. The bridges were originally intended as a bridal path for the Equestrian community. The bridges were an imaginative product of George W. Burke the former Superintendent of City Parks.

She showed photos of the history of the bridges and current photos.

Ms. Quinn stated that the bridges meet more than one of the criteria for historic nomination and recommends that the commission recommend these structures for approval.

The Chairwoman called for comments from the Public.

Matthew Falcone of the Historic Preservationist of Pittsburgh spoke in support of the nomination.

There being no more comments from the Public, the Chairwoman called for questions and comments from the Commissioners.

Ms. Deitrick thanked the department for their hard work in nominating these structures.

There being no more questions or comments from the Commissioners, the Chairwoman called for the motion.

MOTION: That the Planning Commission of the City of Pittsburgh recommends approval to City Council based on the recommendation of the Historic Review Commission.

MOVED BY Ms. Dick; SECONDED BY Ms. Deitrick.

IN FAVOR: Mondor, Askey, Burton-Faulk, Deitrick, Dick

OPPOSED: None <u>CARRIED</u>

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