REHABILITATION OF THE FRANKFORD AVENUE BRIDGE
THE OLDEST BRIDGE IN THE UNITED STATES

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Frankford Avenue Bridge

FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES
Frankford Avenue Bridge

History of the Area

History of the Frankford Avenue Bridge

In-Depth Inspection

Rehabilitation Program

Stakeholder Involvement

Section 106 Coordination

Construction
Pennsylvania Department of Transportation

FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES
District 6-0 Rehabilitation Philosophy

Erwinna Covered Bridge

Walnut Lane Bridge

Stenton Avenue Bridge

Landenberg Road Bridge
FRANKFORD AVENUE BRIDGE: REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES
HISTORY OF THE AREA
Early History

- Native American trail used by the Lenni-Lenape tribe
- Crossed Pennypack Creek in this area because water was not affected by changing tides
- Swedish and Dutch settlers used the trail and forded the waters of Pennypack Creek
The King’s Highway

- 1,300 mile road laid out between the colonies from 1650 to 1735 and connected Charleston, SC to Boston, MA
- Trail incorporated into the King’s Highway system
The King’s Highway

- Bridge over Pennypack Creek constructed circa 1697
- Construction of bridge carried out by local authorities and built by male residents of Lower Dublin Township

William Breton Drawing – December 1830
The Mill Race

- Dale-Sanders Mill in operation by 1697 (located approximately 1,600 feet from the culvert)
- Mill destroyed by fire in 1880
- Summerdale Dyeing, Print, and Finishing Works Inc. appears on 1922 map
- Summerdale Dye Works closed in 1973
FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES
Pennypack Park

- Established in 1905 by City of Philadelphia ordinance
- 1,750 acres of woodlands, meadows, wetlands and fields
FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES
National Register of Historic Places

Frankford Avenue Bridge over Pennypack Creek
(Listed in 1988)
Frankford Avenue Culvert over Former Mill Race
(Determined Eligible in 2017)
HISTORY OF THE
FRANKFORD AVENUE BRIDGE
Circa 1697 Construction

Closed Spandrel, Stone Masonry Arch Bridge

3 Spans – 25’-0”, 25’-0” & 12’-9”

73’ Total Length

22’ out-to-out Width
Circa 1861 - Earliest Known Photo

South Side (Downstream)
Pre 1893 - Roadway

Looking East
Pre 1893 – Toll Gate

Looking West at Railroad Bridge
1893 Widening

Widened to the South Side (Downstream)

44’ out-to-out Width

Raised Roadway Profile
1893 Widening

South Side (Downstream)
FRANKFORD AVENUE BRIDGE: REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES

1893

Looking East (From Railroad Trestle)
FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES
FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES

North Side
(Upstream)

Circa 1900
1910 – Post Card

South Side
(Downstream)
FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES

1950

South Side (Downstream)
1970

North Side (Upstream)

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FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES
IN-DEPTH INSPECTION
Masonry Arch Bridge Components

[Diagram of a masonry arch bridge with labeled components such as roadway, parapet, filler material, abutment, wing wall, keystone, mortar bed, spandrel, belt course, string course, voûtier, mortar joint, arch barrel, spring line, and pier.]
FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES

North Elevation

North Side
(Upstream)
South Elevation

South Side
(Downstream)
Roadway – Looking East
Superstructure - Deterioration
Substructure

East Abutment – South Side

Pier 2 – North Side
North Sidewalk

Looking East
South Sidewalk

Looking East
Safety Features

Looking East
Retaining Wall Parapet – Collision Damage

Looking Southeast

Looking Northeast
Culvert

North Side (Upstream)  South Side (Downstream)
Culvert

Inside Barrel – View from South Side
End of Culvert Wall – Collision Damage Repair

Looking South  Looking Northeast
REHABILITATION PROGRAM
Scope of Work

- In-kind reconstruction of spandrel walls and wingwalls as needed.
- Stone masonry cleaning, repair and repointing throughout.
- Reconstruction of the sidewalks with a new crash worthy roadway barrier between the roadway and the sidewalk that will be attached to a moment slab. Installation of bituminous wearing surface on the slab.
Scope of Work

- The existing decorative pedestrian railing will be salvaged, repaired, painted brown and reinstalled on the bridge.
- Roadway work includes milling and resurfacing the approach roadway and inlet repair.
- Installation of scour protection measures.
- Concrete repair to concrete arch liner.
EXISTING SECTION

FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES

* 49'-7"*

6'-8"*

* 36'-5"* ROADWAY (MIN)

* 6'-6"

6' - 8"*

* 4'-3"

SIDWALK

V * 4'-3"

1-VERIZON LINE & UTILITY LINE IN CONDUIT (12"MP 105"-150")

REMOVE EXISTING PAVEMENT (INCIDENTAL TO CLASS E EXCAVATION), OVER MASONRY

8" PCC CAST TWIN GATE POST TO BE RELOCATED

**

8-VERIZON LINES IN CONDUIT (30'-4") TO BE RELOCATED

**

SR 0041
SURVEY & CONSTR @

EXISTING CONCRETE SPANDREL WALL CAP

METAL MALLING

10" CLAY SEWER (ABANDONED) TO BE REMOVED

36" SANITARY TO REMAIN

1-VERIZON LINES IN CONDUIT (10 WTR & CNG)

EXISTING CONCRETE CRADLE TO REMAIN

EARTH FILL

CONCRETE BLOCK

CONCRETE ARCH LINER

ARCH BARRIER WIDTH

VARIES 44'-0" @ NEAR ABUT TO 43'-0" @ FAR ABUT
FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES

Elevation View
FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES

STAKEHOLDER COORDINATION
Stakeholder Involvement

Pre-Bid Construction Schedule
Political Boundaries
Detour
Pedestrian Accommodation
SEPTA Route 66 Trackless Trolley
Utility Coordination
Pre-Bid Construction Schedule (1 of 2)
Pre-Bid Construction Schedule (2 of 2)

### Group T Masonry Arch Bridge Rehabilitation Project

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Duration</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
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<th>End Date</th>
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<td>Initial Signs, Pavement Markings</td>
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<td>8/22/2018</td>
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<td>9/1/2018</td>
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<td>9/24/2018</td>
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<td>28d</td>
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<td>Repair Concrete Arch Lining</td>
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<td>21d</td>
<td>11/19/2018</td>
<td>1/31/2019</td>
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<td>11/19/2018</td>
<td>1/31/2019</td>
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<tr>
<td>S咖or Pavement</td>
<td>12d</td>
<td>12/19/2018</td>
<td>1/27/2019</td>
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<td>12/30/2018</td>
<td>1/11/2019</td>
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**Legend:**
- **Critical:** Tasks critical to the project schedule.
- **Start After:** Tasks start after the completion of tasks connected with them.
- **Finish By:** Tasks finish by the end of the specified month.
- **Finish On:** Tasks finish on the specified date.

**Rehabilitation of the Oldest Bridge in the United States**
Detour
SECTION 106 COORDINATION
Consulting Party Field Meeting
Section 106 Coordination During Construction
Section 106 Coordination During Construction
Sample Panel – New Stone Highlighted
Sample Panel Detail

- Ribbon pointing with fine sand
- Flush pointing with fine sand
- Ribbon pointing with coarse dark sand
- Flush pointing with coarse dark sand
New Stone Delivery
Contractor Access Roads

FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES
Contractor Access Road – North Side
Contractor Access Road – North Side
Contractor Access Road – South Side
FRANKFORD AVENUE BRIDGE: REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES

CONSTRUCTION
Controlled Demolition
Temporary Arch Support System
Temporary Arch Support System
Contractor Scaffolding
Removal of Roadway and Fill
Exposed Utilities
Fill Removal Continues
Utility Support System
Utility Support System

Original South Spandrel Wall

North Spandrel Wall

Tie Rods

Diaphragm Wall
Concrete Deadman
Concrete Deadman
FRANKFORD AVENUE BRIDGE:
REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES

Removed Portion of South Sidewalk
South Sidewalk Brackets
South Sidewalk Support Bracket Detail
Concrete Removal
Concrete Removal
Concrete Removal
Concrete Removal
Storm Event – April 16, 2018
Storm Event – April 16, 2018
Storm Event – April 16, 2018
Storm Event – April 16, 2018
Storm Aftermath
Storm Aftermath
Storm Aftermath
Storm Aftermath
Concrete Backfill Placed
North Spandrel Wall Reconstruction
North Spandrel Wall Reconstruction
North Spandrel Wall Reconstruction
North Spandrel Wall Reconstruction
Deteriorated Concrete Liner & Ringstones
Ringstone Repair
Constructing South Moment Slab
South Spandrel Wall Detail
Backfilling Utility Bay
North Spandrel and Parapet Walls
Masonry Details
North Elevation
Architectural Detail
Looking East – Preparing Subgrade
North Barrier Transition
North Sidewalk Placement
Finishing Barrier Transition
Masonry Parapet Wall
Concrete Pavement Over Utility Bay
Bituminous Pavement Placed
Pedestrian Railing Installed
Crenulated Top Detail
Ribbon Cutting – September 7, 2018
First Crossing of Rehabilitated Bridge
FRANKFORD AVENUE BRIDGE: REHABILITATION OF THE OLDEST BRIDGE IN THE UNITED STATES
Roadway Looking East
South Elevation
North Elevation
View Thru Span 2