

**S.R. 0295, SECTION 001
SUSQUEHANNA TRAIL BRIDGE
OVER THE CONEWAGO CREEK
YORK COUNTY, PENNSYLVANIA**

PROJECT DESCRIPTION NARRATIVE

The proposed bridge replacement project carries S.R. 0295, Section 001, locally known as the Susquehanna Trail, over the Conewago Creek in Conewago and Newberry Townships, York County, Pennsylvania. The purpose of the proposed project is to replace the functionally obsolete and structurally deficient existing bridge. The substandard design features of the existing corridor will also be improved where feasible.

The existing bridge is a reinforced cement concrete arch built in 1926. It has a structure length of 390 feet comprised of five, 78-foot spans. The bridge alignment curves to the right in span one, adjacent to the south abutment. The remainder of the structure is located on a tangent horizontal alignment. The existing substructure units are skewed and aligned with the direction of the creek flow. The substructure consists of 6 foot wide solid rectangular pier shafts with triangular shaped faces at the upstream and downstream ends.

The proposed bridge is comprised of three, 150-foot long, prestressed concrete I-beam spans for a total structure length of 450 feet. The substructure units are comprised of 3'-6" wide rectangular pier shafts with 4'-6" wide pier caps.

S.R. 0295 follows the Susquehanna Trail along the northbound approach and on the existing bridge. S.R. 0295 then turns and follows along Cragmoor Road just north of the bridge. The southbound approach to the bridge is located on Township Route, T-686, Old Trail Road. Therefore, the through travel movement across the bridge is on the Susquehanna Trail / Old Trail Road corridor.

The proposed horizontal alignment of Susquehanna Trail / Old Trail Road was located downstream of and non-parallel with the existing bridge. The proposed southern bridge abutment was located approximately 160-feet downstream of the existing southern abutment. The approximate 11 degree skew angle between the bridges located the proposed northern abutment approximately 70-feet downstream of the existing abutment.

The proposed alignment is located a sufficient distance downstream of the existing bridge to accommodate bridge construction while maintaining traffic on the existing bridge. The proposed construction limits on the Susquehanna Trail / Old Trail Road corridor extend from Station 30+75.89 to Station 49+00.00 for a total length of 1,824-feet. The alignment begins on a tangent on the southern approach followed by a 6°-45' curve to the right with six percent superelevation. The proposed bridge is located entirely on a tangent alignment, although superelevation transition does occur on the deck. The northern approach curves to the left with a 6°-45' curve with four percent superelevation.

The Cragmoor Road construction limits begin at Station 70+12.00, approximately 55-feet north of the proposed bridge. The alignment curves to the right with a 67°-24' curve superelevated at

two percent and is followed by a 20°-00' curve to the left with six percent superelevation. The limit of construction is located at Station 75+75.00 for a total construction length of 563-feet.

The proposed construction limits of Hykes Mill Road extend from Station 84+70.00 to Station 89+88.00 for a total construction length of 518-feet. The alignment begins on a tangent, followed by a 6°-15' curve to the right with 5.1% superelevation. The alignment then curves again to the right with a 20°-30' curve with five percent superelevation followed by a 100°-00' curve to the left. This curve ties into the Susquehanna Trail roadway approximately 45-feet prior to the proposed bridge.

The Cragmoor Road and Hykes Mill Road roadways were both shifted away from the creek to eliminate their intersection radii from extending onto the proposed bridge. This would allow for the construction of a tangent bridge with a constant width. The southern proposed abutment was shifted towards the creek to further eliminate the Hykes Mill Road intersection radii from extending onto the bridge. Due to the location of the proposed southern abutment, the existing private driveway under the proposed bridge required a slight relocation towards the creek. The proposed work on the driveway relocation extends from Station 19+51.95 to Station 24+80.00 for a total length of 528-feet.

The vertical alignment for the Susquehanna Trail / Old Trail Road corridor begins with a 278-foot crest vertical curve changing from a -3.69% to a -7.00% grade. Prior to the proposed bridge, the alignment begins a 1,220-foot sag vertical curve which transitions to a +7.00% grade near the end of the construction limits. The entire proposed bridge is located within this sag vertical curve. This vertical alignment provides the best combination of desired design speed while matching the existing grade as closely as possible to eliminate excessive fill and accommodate traffic control during construction. In addition, the proposed profile accommodates the 100 year flood event of the Conewago Creek.

The vertical alignment of Cragmoor Road begins at the edge of pavement of Susquehanna Trail. The alignment transitions from level to a -6.96% grade with a 50-foot crest vertical curve. The alignment has a 350-foot sag vertical curve which changes the grade from -6.96% to -0.51%.

The Hykes Mill Road profile begins with a 268-foot sag vertical curve which transitions the grade from -0.62% to +9.82%. The alignment then transitions to level with a 144-foot crest vertical curve and ties into the edge of pavement of the Susquehanna Trail.

The Cragmoor Road and Hykes Mill Road proposed profiles were both designed to provide a relatively level area adjacent to the Susquehanna Trail. These profiles provide for a smooth transition for the turning movements at the intersections and assist in providing the adequate intersection sight distance.

Improvements were made to the skewed intersections at Cragmoor Road and Hykes Mill Road. Both of these roadways were realigned to tie into the Susquehanna Trail at a 90 degree angle to improve the turning movements and increase the intersection sight distance.

The intersection radii for the Cragmoor Road intersection were designed to accommodate WB-50 truck turning movements while utilizing both the roadway and shoulder pavement area. The

School Bus and WB-40 truck turn movements can be accomplished mostly within the roadway lane with minor encroachment into the adjacent shoulder.

The intersection radii for the Hykes Mill Road intersection were also designed to allow WB-40 and School Bus turn movements while utilizing both the roadway and shoulder pavement area. Accommodation of these design vehicles strictly within the roadway lane only was not practical due to the 10-foot travel lanes and the skew of the intersection. WB-50 turn movements could be accommodated at this intersection if the movements encroach on the opposing travel lanes.

The Susquehanna Trail / Old Trail Road corridor and Cragmoor Road are comprised of 12'-0" travel lanes sloped at 2.0% and 8'-0" shoulders sloped at 6.0%. Typical cut sections provide a 15'-0" ditch foreslope on a 1 to 6 slope followed by a 5'-0" ditch backslope on a 1 to 4 slope. The ditch dimensions vary at the limits to construction to tie into the existing conditions. The proposed bridge section will also accommodate two 12'-0" travel lanes with 8'-0" shoulders.

Hykes Mill Road is comprised of 10'-0" travel lanes sloped at 2.0% and 3'-0" to 5'-0" shoulders sloped at 6.0%. The proposed driveway relocation under the bridge is comprised of a 10'-0" wide lane sloped at 2.0% towards the creek.

For pier construction of the proposed bridge, 1/3 width causeways will be constructed from each bank. This method will leave the center 1/3 of the channel open during this stage. For beam erection, having a 3-span bridge arrangement creates the need for the causeway to extend across the middle third of the channel in order to provide access for cranes to place the center span beams, thereby creating a full-width causeway. This condition will be for a short time, only for placement of beams for the center and one end span. While the overall bridge construction will run from approximately January 2009 to November 2009, the full width construction causeway will be in place for less than one month. Deck construction will be from above.

For demolition of the existing 5-span bridge, a causeway constructed from the south bank is the most practical because the proposed roadway at the north bank is about 35 feet above the causeway. Alternatively, the north bank construction causeway could be extended upstream under the completed new bridge for demolition access to the two north spans, but the area required for demolition of the two north spans and piers would leave less than 1/3 of the channel on the south side open for boaters. In addition, access from this location increases the amount of causeway material in the channel. With the preferred method (construction from the south bank only), at least 1/3 of the channel would remain open until the two north spans and pier are demolished. While the overall bridge demolition will run from approximately February 2010 to April 2010, the full width causeway will be in place for 6 weeks or less.

Due to the nature of the existing bridge, piece-by-piece disassembly is not practical. The bridge will be shot and dropped into the Creek after the bituminous pavement is removed. Dropping the bridge directly into the Creek is preferable to widening the causeway to catch the bridge debris because the duration and aerial extent of the temporary impact will be less. The debris from each span will be removed immediately from the Creek before the next span is demolished. The sequence of demolition for the existing bridge is as follows:

1. Extend causeway to pier 1. Drop span 1 into south bank. Remove debris immediately to keep driveway open. South abutment may be removed at any time after span 1 removal.
2. Extend causeway to pier 2. Drop span 2 into Creek. Remove debris and pier 1.
3. Extend causeway to pier 3. Drop span 3 into Creek. Remove debris immediately (same day) to maintain flow capacity between pier 2 and pier 3. Remove pier 3.
4. Extend causeway to north bank. Drop span 4 into Creek. Remove debris immediately (same day) to maintain flow capacity between piers 3 and 4. Remove pier 3.
5. Drop span 5 into Creek. Remove debris and pier 4.
6. Remove demolition causeway immediately after span 5 debris and pier 4 are removed.
7. Remove north abutment from north bank.

Rock which is reused in the demolition causeway must be clean and free of debris. If the rock is not clean, the contractor must select a suitable contained site to wash the rock and pump all sediment laden water into a sediment filter bag and dispose of sediment in accordance with the Erosion and Sediment Pollution Control Plan.

PROJECT DESCRIPTION SUMMARY

Impact				Location					Drainage Area (acres)	Affected Resource
Type	Length (feet)*	Volume (cy)**	Area (acres)	Station/Offset	Latitude / Longitude	Inches North and West	USGS Quad	Municipality		
Proposed 3-150' Spans (450' Total) 40' Roadway Width 30.3' Underclearance Bridge (P)	41	N/A	N/A	40+58, 0' LT	N 40°06'00.5" W 76°45'49.8"	18.5" N 2.0" W	Dover, PA	Conewago Township & Newberry Township	N/A	Conewago Creek (WWF)
Existing 5-78' Spans (390' Total) 24' Roadway Width 16.3' Underclearance Bridge (To Be Removed)	46	N/A	N/A	41+53, 80' LT	N 40°06'00.5" W 76°45'51.0"	18.5" N 2.0" W	Dover, PA	Conewago Township & Newberry Township	N/A	Conewago Creek (WWF)
Wetland Fill (T)	N/A	N/A	0.020	40+75, 134' LT	N 40°05'59.7" W 76°45'51.3"	18.4" N 2.1" W	Dover, PA	Conewago Township	N/A	Wetland 2 (PEM)
Construction Causeway (T)	268	4,850	0.511	40+58, 38' RT	N 40°06'00.1" W 76°45'48.9"	18.4" N 2.0" W	Dover, PA	Conewago Township & Newberry Township	N/A	Conewago Creek (WWF)
Demolition Causeway (T)	260	3,250	0.268	40+58, 135' LT	N 40°06'01.3" W 76°45'52.0"	18.4" N 2.1" W	Dover, PA	Conewago Township & Newberry Township	N/A	Conewago Creek (WWF)
Fill in Floodplain (P) South Bank	N/A	2,383	N/A	39+00, 70' LT	N 40°05'58.9" W 76°45'49.3"	18.4" N 2.0" W	Dover, PA	Conewago Township	N/A	Conewago Creek (WWF)
Fill in Floodplain (P) North Bank	N/A	12,667	N/A	42+50, 110' RT	N 40°06'01.9" W 76°45'50.8"	18.5" N 2.0" W	Dover, PA	Newberry Township	N/A	Conewago Creek (WWF)
Fill in Floodway (P) North Bank	N/A	6,666	N/A	42+50, 150' RT	N 40°06'01.9" W 76°45'50.8"	18.5" N 2.0" W	Dover, PA	Newberry Township	N/A	Conewago Creek (WWF)
Excavation in Floodplain (P) South Bank	N/A	878	N/A	39+00, 70' LT	N 40°05'58.9" W 76°45'49.3"	18.4" N 2.0" W	Dover, PA	Conewago Township	N/A	Conewago Creek (WWF)
Excavation in Floodplain (P) North Bank	N/A	174	N/A	42+00, 230' RT	N 40°06'01.9" W 76°45'50.8"	18.5" N 2.0" W	Dover, PA	Newberry Township	N/A	Conewago Creek (WWF)
Excavation in Floodway (P) North Bank	N/A	174	N/A	42+00, 230' RT	N 40°06'01.9" W 76°45'50.8"	18.5" N 2.0" W	Dover, PA	Newberry Township	N/A	Conewago Creek (WWF)
18" Storm Sewer Outfall to 9'x58' Gabion Mattress (P)	N/A	N/A	N/A	24+33, 14' LT	N 40°05'58.7" W 76°45'47.7"	18.3" N 1.9" W	Dover, PA	Conewago Township	0.88	Conewago Creek (WWF)
24" Storm Sewer Outfall to 9'x23' Gabion Mattress (P)	N/A	N/A	N/A	23+15, 35' LT	N 40°05'59.0" W 76°45'49.0"	18.4" N 1.9" W	Dover, PA	Conewago Township	12.56	Conewago Creek (WWF)
24" Storm Sewer Outfall to 9'x33' Gabion Mattress (P)	N/A	N/A	N/A	72+00, 52' RT	N 40°06'01.6" W 76°45'50.5"	18.5" N 2.0" W	Dover, PA	Newberry Township	6.84	Conewago Creek (WWF)
24" Storm Sewer Outfall to 9'x84' Gabion Mattress (P)	N/A	N/A	N/A	85+02, 34' RT	N 40°05'59.4" W 76°45'53.6"	18.4" N 2.1" W	Dover, PA	Conewago Township	9.28	Conewago Creek (WWF)
18" Storm Sewer Outfall to 9'x12' Gabion Mattress (P)	N/A	N/A	N/A	75+70, 53' RT	N 40°06'00.5" W 76°45'44.4"	18.5" N 1.8" W	Dover, PA	Newberry Township	4.5	Conewago Creek (WWF)

Notes

(T) = Temporary Impact

(P) = Permanent Impact

* - Permanent bridge impact length equals length of pier plus riprap in channel measured parallel with stream centerline.

- Temporary causeway impact length equals causeway length below top of both banks measured perpendicular to stream centerline.

** - Net increase over existing conditions.