2022

LYCOMING COUNTY BRIDGE BUNDLING PROGRAM BUNDLE 2

GROUNDBREAKING

Booklet Presented By: | **Bassett Engineering Inc.**

Bridge Bundling Program Overview

The Federal Highway Administration has required since 1971 that all bridges spanning over 20 feet receive full NBIS inspections at least once every 4 years. Lycoming County suspected that small municipally-owned bridges might be seriously neglected because they had never been formally inspected. PennDOT first surveyed these bridges, and then Lycoming County began inspecting all between 8 to 20-foot spans in 2010; this was the first County-wide Small Bridge Inspection Program in the Commonwealth. Bassett Engineering conducted full NBIS inspections on 104 bridges every one to four years, depending on the conditions from 2010-2016. Over 40% of the bridges were structurally deficient. Some municipalities repaired and replaced bridges, but many were unaffordable. Lycoming County took the initiative to begin this greatly needed infrastructure project. The Commissioners took out a $7.2 million Pennsylvania Infrastructure Bank (PIB) Loan from PennDOT, and they enacted the $5/vehicle annual surcharge on vehicle registration fees to pay back the loan. Bassett Engineering had experience bundling multiple bridges into single construction projects, realizing significant costs and time savings, and the PennDOT Rapid Bridge Replacement (RBR) Program also provided an example. The County worked with its consulting engineers to select the 17 bridges, both over and under 20 foot-span, each from a different municipality, to include in this first Bridge Bundling Program.

The bridge bundling program is upgrading local bridges at significantly lower costs than if each bridge was repaired or replaced individually. Cost savings result from the considerable economy of scale gained by building multiple bridges of the same type under one contract. Bassett conducted a feasibility study considering a wide variety of bridge types to determine the optimum structure for each location. This program also involved a steering committee of the seventeen municipalities, PennDOT, PA DEP, PA Fish& Boat, and the Lycoming County Conservation District.

The project is split into four bundles: each bundle consists of 3 to 5 bridges of the similar structure type. The Feasibility Study began in July 2020. Bundle 1 was designed in 2020 and early 2021 and constructed in 2021. Bundles 2 and 3 were designed in 2021 with construction to begin spring of 2022. Bundle 4 will be designed in 2022 and is expected to be constructed in 2023.

Bridge Bundle 2 Information
Concrete Boxes

Bundle 2 consists entirely of precast concrete structures: arches and box culverts. Box culverts were determined to be the practical choice for Loyalsock Township and Jersey Shore Borough. Boxes are a great fit for urban low-rise sites with higher traffic counts. Boxes will also allow for a minimal footprint on-site to adjacent homes, utilities, and the connection to the existing structure. The Concrete Box Culverts are replacing existing degrading and undersized concrete culverts. In both cases the new structures will improve the existing storm channels hydraulic capacity, reducing the risk of flooding to the neighboring properties during heavy rains, as well as providing long life spans, reducing their overall long term cost to the municipalities who own them.

Sheridan Street, Loyalsock Township

Wilson Street, Jersey Shore Borough

They are designed and delivered as drop in place segments to reduce construction time, and improve the chances of a successful construction effort. They come with pre-cast penetrations to connect to newly installed storm water inlets, and come ready to be capped with cast-in-place concrete driving surfaces. Precast head walls and pedestrian hand rails will be attached at either end of the structures where surface walkways are exposed to the open channels, and the culvert inlets are capped with custom precast end sections allowing for smooth transitions to existing concrete/masonry retaining walls in the urban storm channels. Overall the Precast Box Culvert offers a cost effective and reliable solution to the problem of aging urban storm channel crossings where existing homes or other development make traditional bridge structures unfeasible.

Concrete Arches

Precast arches were chosen for Franklin, Susquehanna, and Moreland Townships due stream and site requirements. These concrete arches will replace two eroding pipe culverts and one structurally deficient beam bridge respectively. Each concrete arch was sized with an increased hydraulic opening allowing them to pass larger storm events with a lower water surface elevation, effectively reducing the potential for flooding due to hydraulic constriction at each site. Erosion and scour will be furthermore limited by the incorporation of concrete wingwalls, headwall, and endwall sized and oriented to promote natural stream flow and protect immediate streambanks from high flows and incoming flows from site drainage.

Valley Road, Susquehanna Township

Bill Sones Road, Moreland Township

Smith Road, Franklin Township

The use of the precast concrete over cast-in-place alternatives helps with quality control and minimizes road closures. The arches, headwalls, wingwalls, and footers are all precast items. These are cast in a climate-controlled facility to ensure tolerancing, fitment, and strength is acceptable prior to shipping. Generally, the footers and all of the precast items take only a few days to install, much shorter than any cast-in-place alternative. Once precast is installed, only backfilling and roadwork dictate the remaining road closures. Guiderail will also be installed at each site to best protect roadway users while crossing each structure.

Completed Concrete Arches and Boxes

Each of the five structures was Prepurchased via COSTARS. This allows time and cost to both be saved. Prepurchase structure cost amounted to $754,260, general constructions cost is $1,776,178, which totals $2,530,438

Thank you to the following:

County of Lycoming, Pennsylvania

Bassett Engineering

WALLACE MONTGOMERY

Wolyniec Construction, Inc