

E&M Engineers and Surveyors, PC

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Springville, New York 14141
(716) 592-2851

Bradford, Pennsylvania 16701
(814) 362-5546

www.emengineers.com

Innovative Trail Bridges

by: Allan R. Vanderpoel, PE

We can make a claim that the best looking bridge in McKean County is now the covered bridge at the Marilla Brook Reservoir. This bridge is part of the proposed one mile trail around the reservoir, and it spans the spillway portion of the embankment. It is easily seen from Highway 346, and even before the completion of the entire trail, it is heavily used (photo below by Kim Benjamin).



The covered bridge was designed by E & M and built by M & M Contractors of Johnsonburg. The bridge was designed as a basic steel stringer span with a wooden deck, but with an optional covered top. The covered portion is supported by two added steel beams on the outside of the deck, and was bid out as an option in case funding was not available.

Special consideration was taken during the design to keep the bridge height and width in proportion. The result bears out a good looking structure. The highest structural concern was the wind coming directly across the reservoir, and

extensive cross bracing was utilized to keep the covered portion from leaning. Since construction, we have seen one wind storm in excess of 60 mph, and the bridge has held up as was intended. And in case you wonder about the heavy bolts and railings used, the bridge was designed to meet the high standards for pedestrian and bicycle use by the AASHTO officials.

The best view of the covered bridge is from the far reaches of the reservoir, and two additional bridges are currently being built to gain access to this area. While high winds were a design concern, it is more common to see a perfectly still day, and the reflection of the bridge in the water is a pretty sight.

The back two bridges are also unique in design. Due to the wetlands in these areas, and the requirement that less than 5% grades be used on the trail, these bridges were designed as trestles, much like you might see on the railroad along Highway 6 as you travel to Kane. The use of the trestle style allowed a taller bridge to span from the high ground on each end, with minimal wetlands disturbance. The sight of the trestles should be equally impressive as you circle the reservoir.

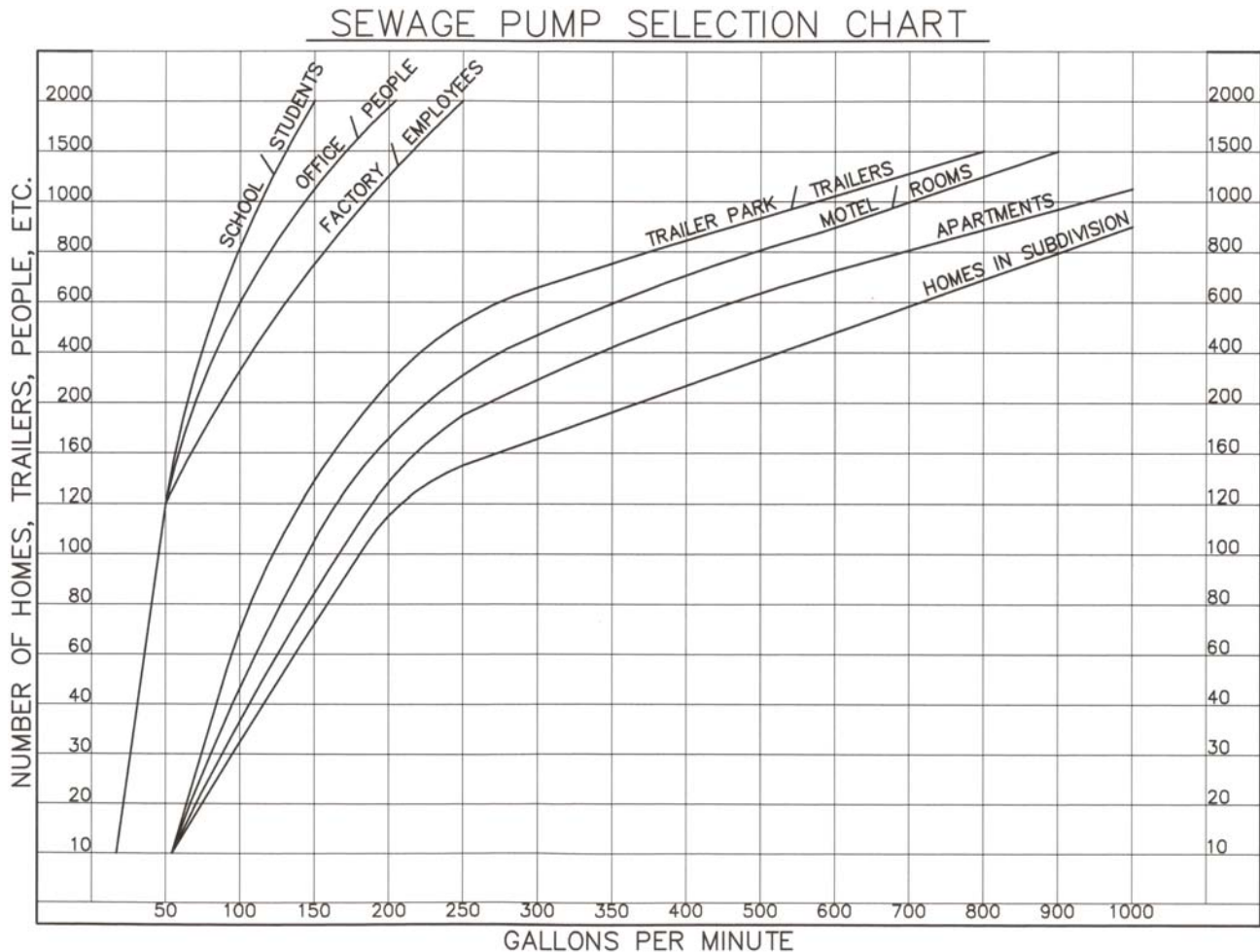
The trail between the two back trestles is being built concurrently with the bridges. In fact, it is now being used as the construction access to the bridges. The final portion of the trail is anticipated to be done in 2005 as a PennDOT funded project. We think you will agree, once you have seen the covered bridge, that it indeed is the new best looking bridge in McKean County.

Sizing Sewer Pumps

By: Jeffrey C. Bahret, PE

So often in “Public Works”, we are asked to approximate needed proportions of equipment with very little design information to make that determination. This is commonly the case with sanitary sewage pumps. Typically, a developer or property owner would be looking for pumping rates in gallons-per-minute (gpm) to serve a proposed subdivision or office building, etc. They are not asking for a pump station design which would require dynamic head conditions to calculate connected horsepower. Rather, the inquirer wants a general guideline to make a development planning decision.

Over the many years of practicing the discipline of public works/civil engineering, we have developed a chart which is useful in providing this information (this chart is reproduced below). Please note that the vertical (Y-axis) is non-linear, and values must be interpolated between labeled numeric points. Facilities of these types must always have duplex pump stations. Therefore, the value determined from this graph is for each pump. Also, this chart may be superseded when specific information is given about the installation or when special considerations must be made.



Pennsylvania Stream Bank Rehabilitation

By: Christopher M. Ernst, PE

The above average rainfall amounts that our area has seen in the last couple of years has led to an increase in the eroding of the banks of many creeks, rivers and other waterways in Pennsylvania. This increase in erosion has damaged or threatened to damage many man made facilities such as underground utilities, roads, bridges/culverts and buildings. To prevent further erosion at critical locations, many municipalities and private landowners have contacted us to see what measures they can take to rebuild the stream banks and to protect them from future erosion in storm events. This article is a summary of what steps should be taken to obtain permission to do the stream bank repairs and to install protection measures in Pennsylvania.

The most common and usually the easiest permit to get for stream bank restoration and protection is a GP-3. The GP-3 is a General Permit for Bank Rehabilitation, Bank Protection and Gravel Bar Removal and it is a registration under an existing statewide permit. The GP-3 is applicable for projects that have a scope of work that is less than 500 feet measured along a single continuous reach of stream channel. The project cannot be within any delineated wetlands or be within an area that is known to be a habitat for endangered species as determined by a Pennsylvania Natural Diversity Inventory (PNDI) search. Also, the project cannot be in any historical, cultural or archaeological sites as determined by the Pennsylvania Historical and Museum Commission or be within 100 feet of a watercourse designated wild in the National or State Scenic Rivers System.

The GP-3's and all other general permits are administered by the County Conservation District in which the project will take place or by the Pennsylvania Department of Environmental Protection (PADEP) District Office.

If the project is excluded from the GP-3 due to any of the above reasons or for any other reason, then a Joint Permit will be required. The Joint Permit is submitted to the PADEP and the U.S. Army Corps of Engineers for review and approval. The Joint Permit is a more in-depth look at the project and the area proposed for the project and may require the seal and certification of an Engineer if the project poses a threat to human life or substantial potential risk to property. The Joint Permit requires the input of the Pennsylvania Museum and Historic Commission and requires an Environmental Assessment to be performed. There are two types of Joint Permits that can be issued and they are Standard and Small Projects. The Small Projects type of the Joint Permit may be used for any projects involving water obstructions and encroachments located in a stream or floodplain which will have an insignificant impact on safety and protection of life, health, property and the environment as defined within the PADEP regulations. The Small Projects Permit Application may not be used for projects located in wetlands. Projects that require technical studies to determine the impact of the project on safety and environmental impacts or are located within wetlands need to be applied for as a Standard Project.

Another type of permit that can be obtained for bank rehabilitation is an emergency permit. The emergency permits are issued by the PADEP and are for situations where there is insufficient time to go through the permit process for the GP-3 or the Joint Permit. These permits will usually be issued if there is an immediate threat to things such as roads, underground utilities or buildings and especially if there is a threat to human safety. The emergency permits are usually issued with the understanding that they will be followed up by the regular permit after the emergency work has been performed.

The easiest way to determine which permit is needed for your stream bank rehabilitation project is to contact your County Conservation

District or the PADEP District Office for your area. They will be able to meet you at the project site and let you know what steps you need to follow to get permission to complete your project.

Stormwater Made Easy (?)

By Glenn D. Cooley, PE

The government has done its best to help you understand stormwater management better. The following is a list of acronyms used in the practice:

BMP	Best Management Practice
CWA	Clean Water Act
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NPS	Non-Point Sources
SWPPP	Storm Water Pollution Prevention Plan
TMDL	Total Maximum Daily Load
CPESC	Certified Professional in Erosion and Sediment Control

In addition to these abbreviations there are the following definitions to assist you:

Best Management Practice (BMP): A measure that is implemented to protect water quality and reduce the potential for pollution from storm water runoff. Any program, technology, siting criteria, operating method, or device that prevents, removes or reduces pollution.

Check Dam: A small dam generally placed in steep ditches for the purpose of reducing water velocity.

Concentrated Flow: Flowing water that has been accumulated into a single fairly narrow stream.

Construction Activity: Includes clearing, grading, or excavation and contractor activities that result in soil disturbance.

Sheet Flow: Any flow spread out such as flow across a flat open area.

Storm Water Pollution Prevention Plan (SWPPP): A plan required by storm water regulations that includes site map(s), identification of construction/contractor activities that could cause pollutants in the storm water, and a description of measures to control these pollutants.

There will be more information on this subject in an upcoming issue of this newsletter.