Congratulations!!

EEI would like to recognize the following employees for their milestone anniversaries with the company:

5 Years: **James P. Schmidt**
Senior Project Technician I (CAD)

10 Years: **John D. Hoffmann, P.E., CPII**
Senior Project Engineer II

15 Years: **Timothy V. Weidner, P.E.**
Project Manager

15 Years: **David S. Stewart**
Senior Project Technician II

20 Years: **Jeffrey W. Freeman, P.E., CFM, LEED AP**
Vice President

EEI congratulates **Collette M. Frohlich, P.E.** on passing the P.E. exam. Also, congratulations to **Michael R. Brouch, P.E., CPII** and **Eric J. Meschewski, P.E., CPII** on earning their APWA CPII certification.

Did You Know?

The City of St. Charles Red Gate Elevated Water Storage Tank was awarded with the "Tank of the Year" award from the Steel Plate Institute/Steel Plate Fabricator Association (SPI/SPFA). EEI performed design and construction engineering while CB&I was contracted to construct this monumental and critical component of the City's water system infrastructure

Enterprises Trivia Challenge

Q: When is World Trenchless Day celebrated? What year was the first one held?

Send your answer to **eei@eeiweb.com** or fax to **(630) 466-6701** by July 31st to be entered in a drawing for a $50 gift card!

Engineering Enterprises, Inc. (EEI), founded in 1974, is an award winning, progressive consulting engineering firm providing services throughout northeastern Illinois. Our expertise includes water, wastewater, transportation, stormwater, construction management, land surveying and GIS.

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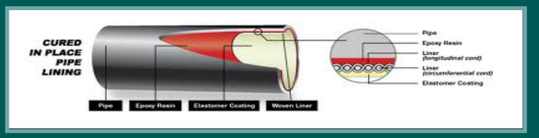
Alternative Ways to Stretch Your Infrastructure Dollars ~ Trenchless Technologies

In this Edition:

Maintenance of underground utilities is a primary responsibility and goal for municipalities and keeping up with and funding maintenance is a constant priority and concern. The use of trenchless technologies is a key component of many municipal maintenance operations. Cured-In-Place Pipe (CIPP) lining has consistently been one of the most useful tools in the toolbox for maintenance of aging sanitary sewer systems and CIPP liners are increasingly being used in stormwater applications.



The use of CIPP liners in sanitary sewer systems is common in north-eastern Illinois because it is cost-effective and less disruptive when compared to open cut replacement of sanitary sewer lines. In addition, lining addresses infiltration concerns and extends the life of existing sanitary systems that need maintenance, but do not warrant replacement. A community can successfully set-up an annual maintenance program using CIPP lining without overly straining the budget. In addition to the advantages listed above, a CIPP maintenance lining program minimizes the need for expensive emergency repairs in the future that can bust a Public Works Department budget.

Spring / Summer 2017

Enterprises

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United City of Yorkville utilizes a CIPP maintenance lining program

For example, EEI recently worked with the United City of Yorkville to start a CIPP maintenance lining program for their sanitary sewers in the older part of town. This allows the City to address immediate and future maintenance concerns of their system for a reasonable annual budget line item. The below table illustrates the CIPP lining maintenance work accomplished during the last four years.

Yorkville Sanitary Lining

Year	Size	Length of Lining (ft)	Total Cost	Status
2014	8"	146	$ 86,574	COMPLETE
	10"	346		
	12"	1,141		
	TOTAL	**1,633**		
2015	8"	4,210	$ 194,565	COMPLETE
	9"	388		
	10"	2,361		
	TOTAL	**6,959**		
2016	6"	501	$ 144,234	COMPLETE
	8"	2,248		
	10"	723		
	12"	254		
	15"	587		
	TOTAL	**4,313**		
2017	8"	3,654	$ 113,261	PROPOSED
	10"	403		
	12"	111		
	TOTAL	**4,168**		

In addition to the wide spread sanitary application CIPP lining is currently gaining traction in our area for use in stormwater systems. The process is nearly identical for storm sewers as it is for sanitary sewers. The pipe is televised, the liner is manufactured to fit the existing pipe, the liner is pulled through the section of pipe to be lined, inflated, cured, and then brought back into service. One reason that lining is not as popular for storm sewers is that infiltration is not as significant a concern unless it is an immediate threat to the structural integrity of the pipe. One significant advantage of CIPP liners for stormwater systems is that the capacity of the storm sewer can be increased due to the flow characteristics of the liner versus an aging, concrete, clay, or metal pipe.

Roadway culverts can quickly become a priority

With roadway culverts, damage to the culvert may be a threat to the stability of the roadway and maintenance can quickly become a priority. The Village of Hinckley in DeKalb County, Illinois, recently used a CIPP liner to address a roadway culvert concern in their community. The existing 30-inch x 42-inch Corrugated Metal Pipe (CMP) located under East Sandwich Road was significantly degraded and needed to be replaced. When the cost to remove and replace the existing culvert proved to exceed the available budget the Village turned to the use of a CIPP lining system, specifically a fiberglass liner using an Ultraviolet (UV) curing process.

Before: Culvert Outfall

There were other benefits besides just the cost savings associated with installing the CIPP liner. The liner provided an increased flow capacity for the culvert without having to increase the size of the culvert. Also, the culvert under East Sandwich Road is adjacent to the Burlington Northern Santa Fe (BNSF) railroad tracks with one end of the culvert extending into the railroad right-of-way. Using a CIPP liner instead of replacing the culvert simplified the permitting with BNSF by making it a maintenance project instead of a construction project. In addition, there was minimal disruption to traffic with the liner option. Full removal and replacement of the culvert would have required lane closures and railroad flaggers resulting in major inconveniences for Village residents.

CIPP Liner Folded Over and Getting Ready to be Pulled Through Culvert

There are two primary CIPP lining systems in use in this area. The most prevalent being a polyester liner cured with hot water or steam and the other a fiberglass liner cured with UV light. In almost all cases either method can be used, but based on project specific circumstances one method may be preferred. For the East Sandwich Road project EEI and the Village chose to use a fiberglass UV cured liner for the following primary reasons:

- The fiberglass UV liner has a greater strength at the same thickness than the polyester heat cured liners. This was a factor for East Sandwich Road since there is minimal cover over the culvert and the impact of traffic loads on the culvert was a concern. The UV liner allowed for strengthening of the existing culvert without reducing low capacity.

- The wastewater from the heat or steam curing process in some liners can be an environmental concern. This is specifically a concern for stormwater applications since the wastewater is often discharged directly into a downstream receiving stream as opposed to being discharged to a wastewater treatment facility in a sanitary sewer application. In some cases, the wastewater can be pumped from the storm sewer into a nearby sanitary sewer. However, for East Sandwich Road there was no adjacent sanitary sewer so it was advantageous to use the dry curing process provided by the UV light.

- Another advantage is the speed of the curing process for UV light versus heat or steam curing. The light train can move at a rate of several feet per minute down the pipe compared to several hours for heat or steam curing a section of CIPP liner. This can be a benefit in situations where you want to minimize the out of service time for a pipe being lined. In this case, since there is a significant tributary area upstream of this culvert, it was preferable to have a shorter cure time.

Lamp Unit Used for Curing Process

After: Culvert Lined and Liner Cured

East Sandwich Road was a successful CIPP lining project that saved the Village of Hinckley money and time. It was completed in a manner that protected the environment and reduced inconveniences to residents. There are many ways that the use of trenchless CIPP lining products can benefit communities in their on-going struggle to maintain critical sanitary and stormwater infrastructure. If your community is interested in considering how CIPP liners can be employed in your maintenance operations or if you would like to investigate specific applications, please contact **Tim Paulson at tpaulson@eeiweb.com.**

President's Message

Peter G. Wallers, P.E., CFM

The civil engineering world is certainly seeing a fair amount of new and emerging technologies.

In this newsletter, we highlight several underground pipe line repair strategies that we have used to successfully repair underground infrastructure. Like many things, the key to utilizing new technology is understanding what it can and cannot do and when it is the appropriate solution. If you ever find yourself in a quandary over what technology to employ on a project, give us a call. We will be happy to walk you through what is out there and what might work for your application.

Now for something completely different, (raise your hand if that phrase rings a bell, Bueller, anybody? Monty Python's Flying Circus, ok now I see a few hands), anyway perhaps a poor attempt at humor. In all seriousness though, for the past few years we have been partnering with a local grade school to host an engineering challenge with their fifth-grade students. It has been a fun and rewarding experience for the engineers at EEI, and we hope the students as well. One thing that has resonated deeply with me is the commitment that the Administration and Teachers have to the students, and the professional and patient manner in which the teachers work with their students. Our goal is to promote engineering and to try and get the students interested in the profession. While we won't know for a while if we were successful, we have been impressed by the creativity and the ingenuity of the participants and are confident that whatever career path they choose they will be successful.

This year's challenge was to build a structure using only rolled newspaper and a limited amount of tape that could support the weight of a text book. This year's winning team did that and more. To view a short video clip of the winning team during the competition please visit our Facebook page at https://www.facebook.com/EngineeringEnterprisesInc/videos/1678603648821957/