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to: Pipe Resource Organization

date: January 19, 1990

from: Nora Jacobs

copies to: Roy Gottesman
Dan Stanowick

subject: Pocket Folder Inserts

Enclosed are several items that we plan to produce as inserts for the new PRO information folder. Chris Bozman asks that you review the material and get back to her with your comments by Friday, January 26. Here is a brief run-down on what you have:

1) A backgrounder on PRO. We plan to produce this on Vinyl Institute letterhead.

2) A proposed masthead design for assorted PRO insert materials and other printed pieces. We recommend that this be printed in two colors, in blue and black on a white gloss stock, as indicated. The layout you have also includes copy in the upper right hand corner that has been added specifically for the PRO case history series that we are creating. (See item 3.) This block of copy would be modified for other projects such as the technical bibliography. (See item 4.)

3) Layouts for the first four Uni-Bell case history reprints. Again, these would be reproduced on the masthead paper described above.

4) A first draft of the technical bibliography. This version includes information from AWWA, PPI, PPFA and Uni-Bell. This document warrants your careful review; if you know that any items listed are out of date, inaccurate or poorly prepared, please let us know. Also, please advise of any additional items you feel should be included.

Pending your comments to Chris, we hope to have this materials produced in time for the February 14 meeting in Miami. If you have any questions, please call.

Nora

Note: We are in the process of obtaining clearances from PPI, PPFA and Uni-Bell on the technical bibliography.

PRO
Fact Kit Backgrounder
EH&Co. Draft 1/19/90

PRO
The Pipe Resource Organization of the Vinyl Institute

PRO, the Pipe Resource Organization, was established in 1988 to promote the use of PVC pipe in water distribution, waste water handling and plumbing applications. PRO is a part of the Vinyl Institute, the national trade association representing the leading manufacturers of PVC (polyvinyl chloride, or vinyl) plastics, raw materials and additives. The Vinyl Institute is a division of the Society of the Plastics Industry, and is headquartered in Wayne, New Jersey.

PRO was established to serve as a clearinghouse for information about the use of PVC pipe. It works closely with other organizations serving the pipe industry including the Plastic Pipe and Fitting Association, the Plastic Pipe Institute and the Uni-Bell PVC Pipe Association. PRO activities include technical research, marketing programs, market development work and public information initiatives.

PRO membership is limited to those companies that are members of the Vinyl Institute. PRO's activities are carried out with the support of these companies and supervised by the Institute's executive director, Dr. Roy T. Gottesman. Mr. David W. Peters, Business Director - Commodity Resins, Occidental Chemical Corporation, chairs the Pipe Resource Organization.

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PVC PIPE RESOURCE REPORT

black { *Another example of PVC pipe performance published by the Pipe Resource Organization of The Vinyl Institute*

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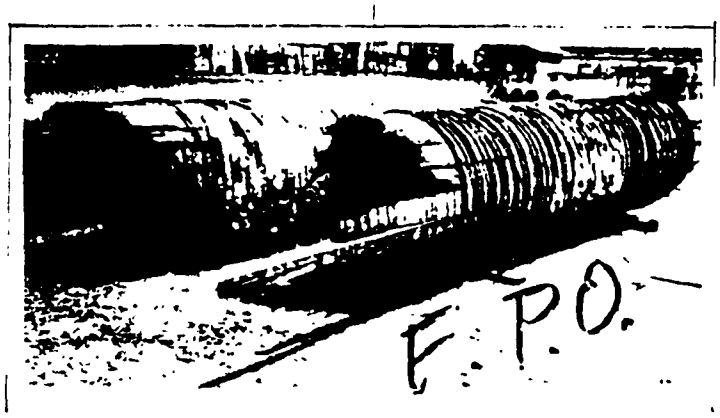
black { *The Vinyl Institute, A Division of The Society of the Plastics Industry, Inc.*
Wayne Interchange Plaza II, 155 Route 46 West, Wayne, New Jersey 07470, (201) 890-9299



36" Wood Stave Pipe, circa 1920's.

Changing of the Guard in Pueblo, Colorado

The Pueblo, Colorado, Water Board is a large water purveyor in the Pueblo, Colorado, area serving a population of over 100,000. Manager of Distribution and Transmission, Terry Book, states, "Our distribution system currently consists of 467 miles of water pipes with over 33,000 metered customers." Water supply for the system is provided by the Arkansas River.

Last year the decision was made to replace a 60 year old section of water main that was becoming more and more prone to leakage. These 30 and 36 inch water pipes were of particular interest in that they were wood stave pipes. As you will see by the picture, the wood staves were circumferentially reinforced by steel bands. Each band had a bolt head that fitted into a formed shoe that was then tightened with a nut.

"The wood itself was doing well, but the bands and service connections were leaking more and more," according to Mr. Book. Leak frequency reached the point where the cost effective decision was to replace.

Out came the wood stave and in went the PVC. 5,000 feet of 24 inch PVC replaced the 36 inch wood and 4,000 feet of 20 inch PVC replaced the 30 inch wood. Both diameters were provided in DR 25 pressure rated 165 psi as per UNI-B-11, "Recommended Standard Specification for Polyvinyl Chloride (PVC) Water Transmission Pipe (Nominal Diameters 14-36 inch).".

Installing 24" DR 25.

The installation photos shown conjure up a lot of mental pictures of the old versus the new. Think of the labor intensive installation of the w od era as opposed to the high tech products and machinery of today. PVC's high strength t weight ratio, longer lengths, high impact strength, etc., all serve to make it today's product f r today's market. Just imagine hand tightening each and every one of those bands!

The wood pipe did well. Sixty years of service for a product of the '20's is very good. Today's products must serve our infrastructure for 100 years and beyond. Pueblo made today's long-term choice, PVC pressure pipe.

Uni-Bell PVC Pipe News
Summer, 1988

Batavia Breaks Ground With North America's Largest Diameter PVC Pressure Pipe Installation

The City of Batavia, New York, has come a long way since its first municipal sewers were installed in 1903. They were, of course, clay tiled. Problem was, the materials had breakage and leaky joints after installation.

Batavia's Director of Public Works and City Engineer, Dennis Larson, explains, "This city is built on a flat bog with an unusually high water table. That plus the fact we have numerous hot soil areas contributed to reduced life spans for some of our force mains. In addition, maintenance costs escalated due to leakage problems on the gravity clay tile lines."

As a result, in more recent years, Larson's engineering team began to include polyvinyl chloride (PVC) pipe in its tendering specifications. The reasons are sound: PVC is unaffected by corrosion; PVC is smooth-walled and, as such, offers less resistance to waste buildup which can dramatically reduce flow capacities.

Now in and around Batavia there are miles and miles of PVC gravity sewer pipes ranging in size from 6-ins. to the large 24 and 30-in. diameter mains.

So, it was to PVC that Batavia turned recently. The project: To provide large diameter PVC pressure pipe for a new 4,900 foot sewer force main capable of moving all effluent in the city from a new central pumping station to an also new treatment plant.

The current 14-in. ductile iron main together with the present treatment plant will be phased out of service.

For the new line, specified as pressure pipe, the Uni-Bell member company recommended its 30-in. SDR 25, introduced to the marketplace in 1987. The pipe meets all industry standards including AWWA C905, "Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 14 In. Through 36 In.," and UNI-B-11, "Recommended Standard Specification for Polyvinyl Chloride (PVC) Water Transmission Pipe (Nominal Diameters 14-36 Inch)," and with 32-in. OD, is the largest diameter (PVC pressure) water transmission pipe made in North America.

"We felt confident in choosing it, largely on the basis of slickness and flow characteristics, and its heavier wall," notes Larson. "Very simply, we were looking for the very best pipe for the job."

Pressure rated at 165 psi, SDR 25 weighs 86.58 lbs/ft and has a wall thickness of 1.280 ins. The design flow rate is 10,608 USgpm and the friction loss rating is only 0.200 ft/100 ft.

According to Larson, the city "has no way to bypass the line. A breakdown would mean a complete shutdown of the system. Consequently, the pipe must perform."

Installation of the new Batavia force main started in mid-May, 1988. It was completed on schedule by September 1. Now tested and ready for use, the force main awaits completion of the treatment plant sometime in 1990.

Bryan Smith of the consulting engineering firm of Tallamy, Van Kuren, Gertis and Associates, Orchard Park, New York, is equally optimistic about the successful, long-term operation of the system. As the resident engineer on the project, Smith anticipates, "No problems whatever," with the unique new force main. One reason is the track record of all of the PVC pipe previously installed in the city. "We have used a lot of Uni-Bell member company PVC pipe with no instances of pipe failure," he says. In the past year, Batavia installed close to 24,000 feet of PVC pipe for gravity sewers, including an additional 2,500 feet of the same 30-in. pipe.

Smith makes his second point by referring to test results for the pressure force main. "Although normal use pressures in the line will be 30-40 psi, we tested it at 100 psi and held that pressure for four successive days. There were no leaks."

The new PVC force main has a capacity of 22 million gals per day. The system is designed for an average flow rate of 6 million gals/day. Peak design

The 30-inch PVC pressure pipe is installed.

This information reprinted courtesy the Uni-Bell PVC Pipe Association.

CTL029561

DR 25 Transmission Pipe A Bonus for Nacogdoches

Many people consider the City of Nacogdoches ideally situated. It is surrounded by several national forests and state historical parks, offers a close proximity to a couple of large lakes and is only a couple of hours from the Gulf of Mexico. On top of all this, Nacogdoches is in Texas.

In the early to mid 1980's, Nacogdoches experienced significant growth. Of course, along with increases in growth come increases in demand for water, not only to swim and recreate in, but to feed lawns and drink as well. "Demands on the old Post Oak Road Pump Station had increased to the point that supply to the station was inadequate to meet requirements during periods of peak usage," according to Mr. John Phillips, Nacogdoches' Director of Public W rks.

The installation of slightly over 10 miles of 20 inch DR 25 PVC transmission main was the ideal solution to meeting additional demands.

A project entitled, "City of Nacogdoches 20 Inch Water Main to Post Oak Road Pump Station," was designed and specified by the Lufkin branch of Kindle Stone and Associates, Incorporated (KSA) under the supervision of Mr. Carl D. McConnell the project manager.

The City of Nacogdoches had used PVC C900, in sizes 4 inch through 12 inch, with great success for a number of years. According to Mr. McConnell, the engineers at KSA also had several years of good experience with PVC. Based on these combined experiences, a decision was made to include PVC as an alternate on the 20 inch project. The engineering analysis revealed that DR 25, pressure rated 165 psi, was more than capable of meeting the pressure requirements.

Left to right: Gary McLaen, McLaen Construction; C.C. Smith, KSA Inspector; Carl D. McConnell, KSA Project Manager.

Even 20" PVC can be maneuvered by the man in the ditch.

Shovel slicing native sandy material into the haunch helps ensure adequate support.

This information reprinted courtesy the Uni-Bell PVC Pipe Association.

CTL029563

The irrigation dam in the background supplies water for the first leg of it's trip through the coulee to the reservoir under construction (back of wing tip) in Magrath, Alberta.

PVC Pipeline Solves Water Problem

One year ago, the entire town of Magrath, Alberta, some 1,600 souls, depended on two wells for their domestic water supply. The water these two wells produced was uniformly hard, containing iron, manganese and lots of salt (over 300 parts per million) Analysis revealed the water contained total dissolved solids of 1,700 parts per million. Residential water pipes suffered as a result, many requiring replacement every five years.

Today, fresh glacial water is delivered at the rate of 2,500 gallons per minute by Canada's first large diameter PVC pipeline. Total dissolved solids are down to a respectable 300 parts per million, making the quality of Magrath's drinking water equal to or better than that of most municipalities across the country. "While we are happy about that, many people here are even prouder of the system that brings the water to us," said Rod Bly, town manager.

The new PVC pipeline stretches for six and one-half miles over the rolling foothills surrounding the town. The efficient design provides pressure of 50-70 psi at every residential tap in town, without the need for even one pumping station anywhere down the line.

The new pipeline is part of a complete water supply system that includes a 1.4 million gallon reservoir, a dam and a filtration plant, located five miles from Magrath and at an elevation some 200 feet above the town.

The first leg of the pipeline is an 18-inch large diameter PVC pipeline 8,200 feet in length that feeds waters from the nearby Waterton Valley rivers to the new reservoir. From there, a 20-inch large diameter PVC pipeline takes the water 27,300 feet, completing the route to the town.

The Magrath project has proved to be well worth the additional eight dollars per month each resident has added to their water bill. In addition to the obvious benefits of cleaner and more plentiful water, the project was completed on time and utilized local labor for much of the work. A good portion of the money spent on the project stayed right in Magrath in the form of wages.

The final bill on the project was $3.1 million. Magrath's share of the cost was 20%, with the Alberta Department of Environment picking up the remaining 80%.

When asked how a project this size managed to come in on time and on budget, project manager George Hasegawa replied: "By doing it ourselves, by eliminating pumping stations and by going to PVC pipe."

Hasegawa calculated that each and every resident (of which he is one) saved about $100 by using these methods and materials. The pipeline itself accounted for $825,000 of the total project cost, including all fittings.

The average depth of bury was eight feet. The one-day maximum laying rate was 1,150 feet.

This information reprinted courtesy the Uni-Bell PVC Pipe Association

Published by the
Pipe Resoure Organization
of the Vinyl Institute

Technical Information Available

Information on the use of PVC pipe in water distribution, waste water handling and plumbing systems is available from the following organizations. The publications listed are subject to availability and there may be a charge for some items. To order these publications, contact each organization directly.

From the American Water Works Association (AWWA), 6666 West Quincy Avenue, Denver, CO 80235. (303) 794-7711:

AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 Inch Through 12 Inch, For Water Distribution, published in 1989. Describes ANSI/AWWA standard C900-89.

AWWA Standard for Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 14 Inches Through 36 Inches, published in 1988. Describes ANSI/AWWA standard C905-88.

PVC Pipe — Design and Installation, manual of water supply practices published in 1980. Publication number AWWA No. M23.

From Uni-Bell PVC Pipe Association, 2655 Villa Creek Drive, Suite 155, Dallas, TX 75234. (214) 243-3902:

Information related to water distribution systems:

External Corrosion of Underground Water Distribution Piping Systems, Bulletin UNI-PUB-7 (14 pages).

Grounding, Locating and Thawing Procedures for Water Mains and Services, Technical Report UNI-TR-2 (10 pages).

Recommended Practice for the Direct Tapping of Polyvinyl Chloride (PVC) Pressure Water Pipe, Bulletin UNI-B-8 (4 pages).

Recommended Practice for the Installation of Polyvinyl Chloride (PVC) Pressure Pipe, Bulletin UNI-B-3 (7 pages).

Recommended Standard Performance Specifications for Joint Restraint Devices for Use with Polyvinyl Chloride (PVC) Pipe, Bulletin UNI-B-13 (4 pages).

Recommended Standard Specification for Fiberglass Overwrapped Polyvinyl Chloride (PVC) Pressure Fittings, Bulletin UNI-B-14 (12 pages).

Recommended Standard Specification for Polyvinyl Chloride (PVC) Pressure Fittings, Bulletin UNI-B-12 (12 pages).

Recommended Standard Specification for Polyvinyl Chloride (PVC) Water Transmission Pipe (Nominal Diameters 14-36 Inches), Bulletin UNI-B-11 (20 pages).

Tapping Guide for PVC Pressure Pipe, Bulletin UNI-PUB-8 (20 pages).

Information related to waste water handling:

Installation Guide for PVC Sewer Pipe, Publication UNI-PUB-6 (28 pages).

Maintenance of PVC Sewer Pipe, Technical Report UNI-TR-3 (14 pages).

Recommended Performance Specification for Polyvinyl Chloride (PVC) Profile Wall Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter (Nominal Pipe Sizes 4-48 inches), Bulletin UNI-B-9 (8 pages).

Recommended Practice for the Installation of Polyvinyl Chloride (PVC) Sewer Pipe, Bulletin UNI-B-5 (16 pages).

Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe, Bulletin UNI-B-6 (14 pages).

Recommended Standard Specification for Type PS46 Polyvinyl Chloride (PVC) Plastic Gravity Sewer Pipe and Fittings (Based on Performance Requirements) (Nominal Diameters 4-15 inches), Bulletin UNI-B-10 (4 pages).

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Thermoplastic Water Piping Systems, published August 1973. Report number TR16.

Water Flow Characteristics of Thermoplastic Pipe, published March 1971. Report number TR14.

Weatherability of Thermoplastic Piping, published March 1973. Report number TR18.

Note: PPI also publishes a list of standards for plastic piping generated by the American Society for Testing and Materials (ASTM), the American National Standards Institute (ANSI), the U.S. Department of Commerce, the Department of Defense, the Department of Agriculture, the Department of Housing and Urban Development, the National Sanitation Foundation (NSF), the Sprinkler Irrigation Association (SIA), the International Association of Plumbing and Mechanical Officials (IAPMO), the National Swimming Pool Institute (NSPI), the American Water Works Association (AWWA), the American Association of State Highway and Transportation Officials (AASHTO), the American Society of Agricultural Engineers (ASAE), the Canadian Standards Association (CSA) and the Canadian Government Specifications Board (CGSB).

From the Plastic Pipe and Fittings Association (PPFA),800 Roosevelt Road, Building C, Suite 20, Glen Ellyn, IL 60137-5833. (708) 858-6540:

Crush Strength and Flexibility of Thermoplastic Piping, Bulletin number 1-80.

The Growing World of Plastics Piping: A Comprehensive Listing of Common Applications of Plastic Plumbing Systems Covered by National Consensus Standards.

Hydrostatic Strengths and Suggested Pressure Ratings for CPVC 4120 at Various Temperatures, Bulletin number 2-80.

Indent Marking, Bulletin number 5-80.

Noise in Piping, Bulletin number 7-82.

Plastic Pipe in Fire Resistive Construction, published July 1985.

Plumbers' Installation Handbook.

Position on the Use of Solvent Cements for Transition Joints between ABS and PVC Nonpressure Piping Components, Bulletin number 12-85.

Pressure Rating of PVC Plastic Piping for Water at Elevated Temperatures, Bulletin number 3-80.

Thawing Thermoplastic Water Pipes, Bulletin number 10-83.

Thermoplastic Piping in Residential Fire Sprinkler Systems, Bulletin number 9-83.

Use of Banded Flexible Connectors in DWV Systems as a Transition Between Iron Spigot and Plastic Spigots, Bulletin number 11-84.

Note: PPFA also offers audio/visual programs on the following topics: Joining and Adapting Plastic Pipe, Installing Plastic Sewer Pipe, Installing Plastic DWV Piping.