Public Affairs Committee
International Affairs Committee

J. F. Welch

J. F. Welch, Director, Public Affairs

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Magazine Article - Civic Public Works Magazine

Enclosed is a copy of an article mentioned by Bert Cook (Atlas-Turner, Inc.) at the Public Affairs Committee meeting in Palm Springs. The article alleges that A/C pipe has "essentially died" as far as the municipal piping business is concerned in Canada.

Certain-teed Corporation has sent a letter to Johns-Manville Canada expressing its displeasure with the opinions articulated by the author. Moreover, Atlas-Turner, Inc. also intends to rebutt the article and will forward a copy of its response to Committee members.

If you have any questions, please do not hesitate to call.

JFW/ajb

cc: A. Kahn, Esq.
N. Rahn, Esq.
N. Battle

copies to:	Public Affairs Committee	International Affairs Committee
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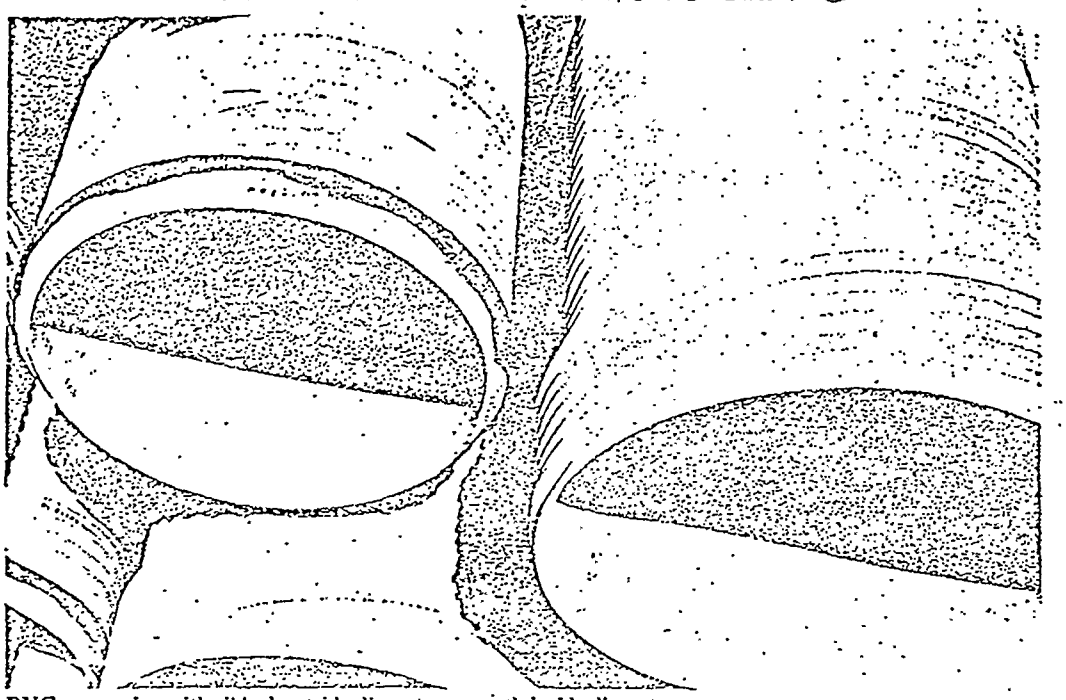
PIPE... then, now and the future



PVC sewer pipe with ribbed outside diameter, smooth inside diameter

WATER Management

by Tony Weall,
Merchandising Manager—Pipe,
Johns-Manville Canada Inc.

Technological changes in the piping of water and waste water have taken place at a very slow pace when compared to changes in other disciplines such as industry and military.

There are many influences that determine this situation. A large portion of the users of municipal pipes are not equipped to handle the research that would allow innovative decisions; they tend to rely upon national standards such as ULC, CSA, AWWA and ASTM. These standards are generated by highly technical people but the groups tend to be large and changes come only after prolonged deliberation.

In addition to this conservative influence is the relatively high cost of failure in terms of dollars and danger to public health and the fact that in at least half the work done in the subdivision, the specifier is in no way responsible for the purchase of the piping product, but only the maintenance.

All of those factors tend to make the atmosphere for changes in the municipal piping of water and waste water quite conservative.

The technology of using pipes goes back over two thousand years and the slow rate of change in technology can be illustrated by the fact that systems very similar to the oldest known systems are still in operation today in North America. Bored out wooden poles have been operating well into the '60s and no doubt there are still many in operation in remote areas.

Certainly, wood stave pipes are quite common and even economical for new systems under ideal conditions.

Lead pipes have fallen from popularity as pressure pipe due to possible contamination of water, but it is certain that lead pressure pipes and drain systems are still in operation in North America, although neither of these products is made today.

Clay pipe is, of course, still actively made and used across North America. Wood, lead and clay pipes are the oldest pipes known to man. While they all have suffered severe setbacks in popularity, they are still in use and in the case of clay, still being manufactured.

Only in the municipal piping field could produc[illegible]hat were first avail-

able 400 years ago be called modern. Copper and iron pipes possibly even predate this but they are still actively used. Indeed, it is only within the past fifty years that there have been viable alternatives to these products.

The modern day products of extruded copper and ductile or modular iron pipes are still prominent in the marketplace in North America and are still available in Europe. When comparing the modern materials to the older material, it is the similarities that are more notable than the differences.

One product has been totally eclipsed by time. Masonry sewage and drainage pipes have been totally replaced by concrete and steel pipes but even here some of our older cities are still living with these anachronisms.

Although the very oldest types of pipes are still in use, there has been considerable development in modern time, if we consider modern times to be the past fifty years. Products such as steel pipe, first riveted and later welded, added a new dimension to large diameter pressure pipe.

Asbestos Cement pipe for both pressure and sewer freed the designer from the corrosion problem, forced the introduction of the gasketed joint and for the first time, provided a viable alternative to iron pipe.

Other developments in this period were reinforced concrete pipe, concrete pressure pipe, the change from grey to ductile iron and in the last ten years, the introduction of plastic pipes.

Changes in the last fifty years have generally been more evolutionary rather than revolutionary but there have been some significant changes. The changes in the last ten years have been more radical and these will be looked at in more detail in order to try to predict what will happen in the next ten years.

Several shifts in the acceptance of new and different pipes can be traced back to the late 1960s. While dates cannot be assigned to each event and the rate of changes has been different from one product to another, 1965 to 1970 seems to mark a type of watershed.

Ductile Iron was introduced in this period and an American Water Works Association (AWWA) standard was developed by 1965. Polyvinyl Chloride (PVC) and Polyethylene (P.E.) were introduced although an AWWA standard would not come until 1975 for PVC and has not yet appeared for P.E. Generally, there was an upgrading of the performance requirements of sewer pipe in terms of infiltration/exfiltration. This increased the demand for Asbestos Cement pipes and prepared the marketplace for PVC pipe which would not be really active until the mid '70s.

Since the start of the '70s, the story in the municipal pipe field has been PVC pipe and that is the story of the present and the story of the future.

Fig. I Weight Comparisons of PVC Pipes

	Pre 1970	Post 1975
Water Pipe	CSA B137.3 SDR 26	AWWA C900 DR 18 CIOD
Size		
6	3.41 lb./ft.	5.24 lb./ft.
8	5.78 lb./ft	9.03 lb. /ft.
12	12.61 lb./ft.	19.19 lb./ft.
Sewer Pipe	CSA B137.3 SDR 41	ASTM D3034 DR 35
Size		
4	1.01 lb./ft.	1.03 lb./ft.
8	3.71 lb./ft.	4.11 lb./ft.
12	8.12 lb./ft.	9.10 lb./ft.

The acceptance of the use of PVC pipe for water and sewer applications can be attributed to two factors:

first, PVC had been performing well for a number of years in many isolated areas and the performance would force more use;

and, second, an upgrading of the material standards would greatly increase acceptance.

The pipes produced to the new standards were considerably heavier and costlier than the old products (see Fig. 1), however, the designs were now visibly more conservative and they met a more generally acceptable standard authority. These two products gained rapid acceptance through the '70s.

Although the sewer pipe was introduced later, its acceptance was somewhat more rapid, largely due to the perception that the risk and consequences of a failure are less severe in a gravity sewer pipe than they are in pressure water pipe.

Another reason for rapid acceptance of PVC sewer pipe is the marked superiority in terms of installation and leakage testing when compared to the former high quality sewer pipe—Asbestos Cement.

The acceptance of PVC was inevitable but it was accelerated by higher quality standards introduced in the early to mid '70s and excellent performance.

The final proof of the acceptance of PVC pipe in Canada was the closing of the Johns-Manville Asbestos Cement pipe plant and the closing of the last eastern Canadian Clay pipe plant in 1980.

Asbestos Cement dominated water pipe sales in western Canada and sanitary sewer pipe sales in eastern Canada were dominated by Clay and Asbestos Cement. There is only one AC pipe plant in Quebec that produces considerably less than the JM plant.

Clay and AC have demonstrated that they have almost completed their life cycle as demand for both in Canada looks very bleak indeed. These are two products which have essentially "died". There is no doubt that we will see more products experience a similar fate in the 1980s.

Certainly the "present" for the municipal piping business is represented by PVC pipe. It is the dominant force in the waste water systems and is very important and growing in potable water systems. The future for PVC and other plastics looks very promising indeed. Evolutionary changes will be an increasing of the pipe size range and pressure range. There are, no doubt, revolutionary changes around the corner that will have significant effects over the next 5 to 10 years.

In pressure pipe the emphasis will be on increasing the size range and increasing the pressure rating while conserving weight. Fiberglass composite pipes are already available, while these are expensive now, they certainly display excellent weight/strength characteristics.

An AWWA standard has been an-

nounced for this type of pipe so that acceptance can be expected to increase. PVC still has much potential for pressure pipe.

One British company has announced a "pre-stressed" pipe in which molecules are aligned to get favourable physical characteristics. It is claimed that wall thickness reductions of up to 50% are possible with no loss in long term strength.

There appears to be little potential for other plastic material as PVC has the lowest cost relative to strength of all the thermoplastics. It would appear that modified PVC or a thermosetting composite material would be the product of the future in pressure systems.

The options for sewer pipe are considerably more varied and in many ways more interesting. Strength is not as important a consideration but material stiffness is. The options appear to be, a normal PVC, a thermosetting or thermoplastic sandwich-type of construction, a foamed thermoplastic, a stiff thermoplastic such as a filled and/or reinforced polyethylene or polypropylene, or a non uniform cross section, or a combination of these.

Several manufacturers have developed thermosetting plastic/fiberglass composite pipes with a sandwich construction in Europe and the U.S.A. A few thousand feet have been installed in Canada, although none in the last five years.

The use of polyethylene and polypropylene has been limited to corrugated drainage pipe in the small diameters. There have, of course, been some larger pipes made in uniform wall polyethylene used in sewers. Foamed thermoplastic pipes are still very much in the experimental stage.

In December of 1980, the first trial installation of 250 feet of a non uniform pipe wall was installed in Mississauga, Ontario. The pipe was fabricated from a continuous strip of PVC with a ribbed cross section. This was factory spirally wound and welded into a 24 inch internal diameter tube. The joints were post formed bell and spigot. The effect of ribbing is to provide a pipe with a stiffness equal to the DR 35 pipe, that has recently become popular, with a weight saving of about 40%. This promises to extend the competitive size range of PVC pipe to at least 24 inch diameter.

The sewer pipe market seems to hold potential for more innovative ideas than the pressure pipe market. This is due to a perception of lower risk and consequence of failure and different physical requirements of pipe.

There have been relatively few changes in piping of water and waste water in the past two thousand years. Most of these changes have occurred in the past fifty years. Recently there has been activity and these changes may well be the precursor of more changes.

The changes that can be expected in pressure are more plastics and new plastics. The changes that can be expected in non pressure pipes are also more plastics, new plastics and new innovative cross sections.

These new sections will increase the pipe stiffness with minimum increase in weight. The reduction of weight is, of course, the ultimate goal that will provide high quality pipe at a competitive cost.

Mirabel land to be released

Paul Cosgrove, Minister of Public Works, announced a new policy that would see the releasing from federal ownership of some of the federally-controlled land surrounding Mirabel airport. Such disposal of the so-called Mirabel Peripheral Lands would be on the understanding that the Federal Government continue to provide adequate protection for Mirabel airport.

Over the next few months, Public Works Canada, in consultation with other federal departments, will be developing a detailed management and disposal program.

Total federal property at Mirabel is 38,850 ha (96,000 ac) of which 7,285 ha (18,000 ac) is the airport facility, and the remaining 31,565 ha (78,000 ac) makes up the peripheral lands. When the property was first acquired in 1969, it was felt that federal ownership would provide the best guarantee of airport protection. Since then however, a number of developments, such as the zoning of the land for agriculture and the development of quieter aircraft, have led to a reassessment of the necessity for continued full federal control.

GRCDA directors

At the third Annual Business Meeting of the Ontario Chapter of the Governmental Refuse Collection and Disposal Association, the following were elected to the 1981 Board of Directors:—

President:
Frank Condlln, P.Eng.,
Director, Waste Management,
Regional Municipality of Peel.

Vice-President:
Ray Funnell, P.Eng.,
City Engineer,
City of Guelph.

Secretary-Treasurer:
Peter Wong, P.Eng.,
City Engineer,
City of Sudbury.

Past-President:
Alfred Gretzinger, P.Eng.,
Town Engineer,
Town of Stoney Creek.

Corporate Directors:
Doug Bell,
Vice-President & General Manager,
Provincial Sanitation Services Ltd.
Ron Brodie,
General Manager,
S.M.I. Ontario.

Directors:
Dave Curry, P.Eng.,
Director of Operations,
City of Ottawa.
Doug Day,
Deputy Commissioner of Works,
Borough of Etobicoke.
Neil Fox, C.E.T.,
Superintendent of Works,
City of Barrie.
Shafik Thomas,
Director of Engineering & Planning,
Town of Wallaceburg.

Workshop

Saskatchewan hosts its first Canadian Prairie Chapter GRCDA workshop from April 22-24 and it will be held at the Regina Inn. Topics will include collection trends; tire recycling; safety and training; shredding/sanitary landfill; provincial disposal regulations; labor relations, vehicles and equipment; and hazardous waste.

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