

Know You Should



A Message from the American Concrete Pipe Association

Bulletin No. 116

HDPE Pipe Claims on Internet Not Grounded in Fact

Revised January 29, 1999 – 2 pages

The vast amount of material available on the Web, while extremely valuable, can sometimes be misleading. In fact, at times the information can be outright inaccurate. For example, a major HDPE pipe manufacturer's Web site has contained many comparisons between concrete pipe and profile wall polyethylene pipe with an interior liner, which can be disputed. Following are some of the main points of contention:

HDPE Claim: *Using corrugated high-density polyethylene (HDPE) drainage pipe instead of RCP carves significant dollars from highway, culvert and storm sewer construction projects without compromising project integrity.*

FACT: No facts or figures are provided to back up this claim so the entire premise is suspect. Further, it is difficult to determine from this generalized statement whether the HDPE pipe manufacturer is evaluating the material cost, initial installation cost or cost over the life of a project.

HDPE pipe is not lower when it includes the cost of bedding and backfill. HDPE promotes lower cost based solely on pipe cost. To get a true picture, you must consider pipe cost plus installation cost, including backfill. The installation cost for concrete pipe is normally lower than HDPE pipe. When compared with similar diameter HDPE pipe using approved installation procedures, e.g. select backfill, compaction requirements and other installation-related costs, the installed cost for concrete pipe is almost always lower than (or at least comparable to) the installed cost for HDPE pipe. And when you factor in other costs, such as replacement costs and public inconvenience, the installed cost over the life of the project is even more favorable for concrete pipe.

While many HDPE pipe manufacturers tout that their products may be cheaper up front, they often do not consider in the equation the project's design life, material service life, maintenance costs, replacement costs and residual value. To determine the "real" cost of a project, a life cycle cost analysis that factors in these other costs must be performed. HDPE pipe may require maintenance or replacement over a project's service life, while RCP is virtually maintenance-free. And, unlike HDPE, concrete pipe does not deteriorate with time and has a proven service life of 100 years or more, making it the more reliable and economical choice in the long term.

HDPE Claim: *Using HDPE pipe instead of RCP requires less equipment, speeds up installation and enhances project safety.*

FACT: Although light weight is often touted as an advantage by HDPE pipe manufacturers, the longer lengths of HDPE pipe result in total weights often greater than two workers can safely lift. Therefore,

equipment for handling and installation is still necessary. Installation speed is dependent upon rate of excavation rather than pipe placement. Contractors normally install concrete pipe with the same equipment used to excavate a trench, so no additional equipment is needed.

The use of trench boxes during HDPE pipe installation pose additional challenges that can slow up installation. It is very difficult to maintain proper compaction of backfill materials for side support when using a trench box that extends down to the bottom of the trench. Typically, trench boxes are required to ensure worker safety. If a trench box is used with HDPE pipe, its longer length makes it more difficult to position and remove the trench box so as not to disturb the side support soil. On the other hand, RCP can be designed based on the reduced side support that can occur when a trench box is used during installation.

Another point to consider, with longer lengths and low stiffness of HDPE pipe the grade can be harder to maintain due to longitudinal bending of the pipe. This can lead to ponding and a reduction in flow capacity. Concrete pipe's beam strength minimizes the affect of bedding abnormalities and contributes to on-grade alignment. Because of concrete pipe's shorter lengths, the correct grade is easier to obtain and it is checked more frequently. And concrete pipe weight provides for greater stability during installation, allowing placement of the fill material without concern for pipe misalignment.

HDPE pipe manufacturers fail to mention that due to the lighter weight of HDPE, flotation can also be a serious problem. This, coupled with the potential for misalignment and damage during backfilling, certainly does not reduce installation costs.

Furthermore, with low stiffness HDPE pipe, the soil provides 95 percent or more of the supporting strength of the **soil**-pipe system, placing most of the burden of supporting strength of the system on the installation method, type of backfill material and compaction. By contrast, with concrete pipe the vast majority of the supporting strength of the **pipe**-soil system is delivered to the job site with the product, making it much more "contractor friendly."

HDPE Claims: *The total cost of installing RCP, including material, labor and equipment, is 30 to 50 percent higher than HDPE pipe.*

FACT: Because HDPE pipe has little strength of its own, it relies almost completely on the structural capacity of backfill, which often needs to be imported to the site. Backfill requirements are also greater for HDPE pipe, normally a minimum of one foot above the top of the pipe – versus support only to the springline for RCP. In many cases, wider trenches are required to provide proper side support for HDPE pipe. These additional backfill material requirements, along with the additional compaction and inspection efforts, require spending a lot of extra time and money on requirements not necessary for the installation and performance of reinforced concrete pipe.

Further, as more and more owners require mandrel testing of HDPE pipe after installation, mandrel testing costs should be factored into the total installed cost of HDPE pipe.

Ask for Facts!

Additional facts that HDPE pipe manufacturers like to avoid: HDPE pipe is flammable and is subject to reduction in strength when temperatures are above or below 73.4°F – all conditions that do not affect concrete pipe. Also, the mechanical properties of HDPE pipe material are dramatically reduced as a function of time.

So the next time you see a superiority claim for HDPE pipe products, check out the claim by asking for the facts. You will quickly discover why many HDPE pipe claims are based on fiction, rather than fact.