

Plastic Gas Pipe Encasement Under Roadways

Improved systems will cut cost.

Reducing installation and maintenance expenses and increasing return on investment are important to every company. The ever increasing expense of material used in the natural gas industry demands that new ideas be researched and developed. These new ideas must promote system integrity while reducing installation and maintenance expenses. Continuing to do the same old thing, the same old way, brings the same old result. Plastic pipe has revolutionized the natural gas industry. Since its development for natural gas distribution, plastic encasement pipe has gained widespread acceptance from utility owners, government agencies, and consumers. A new horizon has developed for plastic encasement pipe with its use as a casing pipe for roadway crossing.

Plastic encasement pipe for roadway

crossings will reduce utility owner's initial capital investment by 30 percent to 70 percent when compared to steel encasement. This plastic encasement system will also reduce a utility company's long-term maintenance expenses and provide future replacement options. Replacements for system growth and system integrity issues can be completed with minimal capital investment. This information

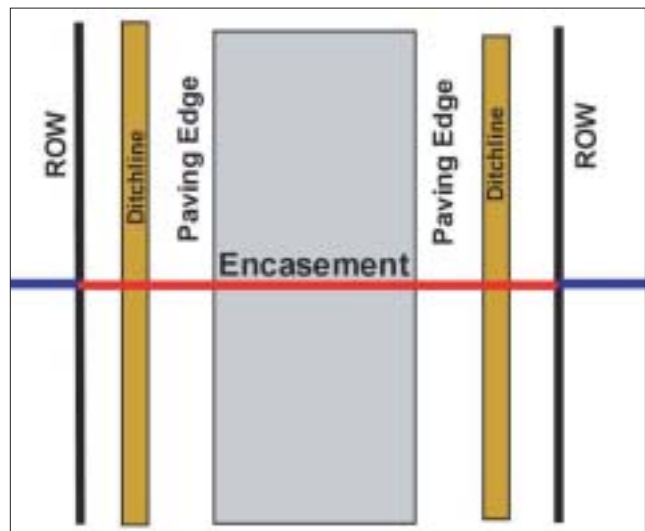


Figure 2. Typical Encasement Pipeline Road Crossing-ROW to ROW. Polyethylene encasement pipeline road crossing (shown here in red) extends from ROW to ROW.

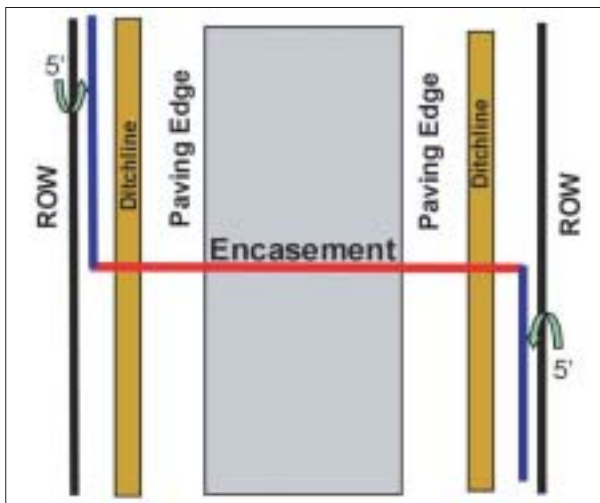


Figure 1. Typical Encasement Pipeline Road Crossing-Parallel Installation. Polyethylene encasement pipeline road crossing (shown here in red) extends from "ell" to "ell," or the point of turn.

to state highway department utility divisions for 48 states to receive input and comments, which to date have been overwhelmingly favorable. Public service commissions, which have also reviewed this application, have commented that plastic encasement pipe amounts to rate relief for utility customers.

Plastic encasement pipe is acceptable for all below ground locations because it is both strong and non-corrosive. The design of plastic encase-

ment installations increases public safety and reduces maintenance issues for both federal and state agencies as well as utility owners.

The plastic encasement system is from Eagle 1 Resources, Auburn, AL, a strategic planning and subsurface utility engineering firm. Installation depths are six ft below the pavement and four ft below the ditch line of any crossing location. The limits of the plastic encasement must extend to the point of turn or within five ft of the right-of-way. If the proposed installation is being installed cross-country, the plastic encasement must be installed from right-of-way to right-of-way. (See Figures 1 and 2.)

Pipeline markers are installed within one ft of the highway right-of-way and the point of crossing of the plastic encasement. All crossings should be as

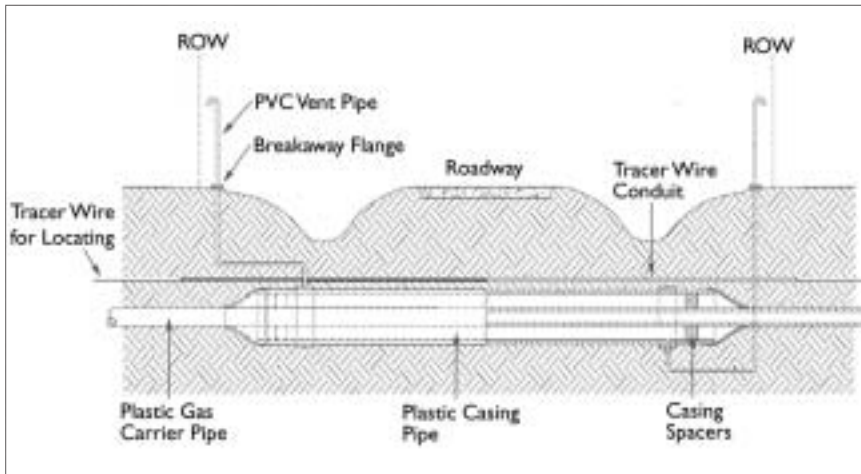


Figure 3. Plastic Encasement Pipe Installation.

near perpendicular as possible. Pipeline joints within the area located between the roadway side ditches must be made by an operator qualified fusion joint installer. All joints must be reviewed and approved by a project inspector provided by the utility owner. Each joint must be qualified to operator qualified standards under applicable U. S. Department of Transportation regulations.

Vent pipe must be connected to the plastic encasement by means of a fusion saddle connection or a bolt on saddle connection. The vent pipe should have a breakaway flange connection at ground line elevation. PVC vent pipe is installed above ground from the breakaway flange connection. Pipeline markers with tracer wire connections must be installed at the vent pipe above ground location. All above ground vent pipe must be within the back two ft of the right of way. (See Figure 3.)

Some of the advantages of plastic encasement include:

- Increased public safety—Due to the extended amount of encasement, additional depth, PVC vent pipe, bypass conduit, and testing of the encasement, public safety will be increased dramatically.
- Testing of Encasement—If required by the governmental agency, pre-installation testing of the plastic encasement can be completed. This would be a new concept to air test an encasement to ensure air tightness and qualify the integrity of the encasement. (See Figure 4.)

- Installation Method of the Encasement—Directional drilling operations will reduce the potential for voids under the roadbed due to reduced material removal. The injection of gel material for the encasement installation will also fill any voids under the roadbed and promote long-term roadbed integrity.
- Bypass Operations—A plastic encasement conduit pipe is proposed for installation near the encasement for tracer wire and future bypass operations. The bypass operations will be beneficial to both the utility owner and the governmental agency. The conduit pipe will allow the

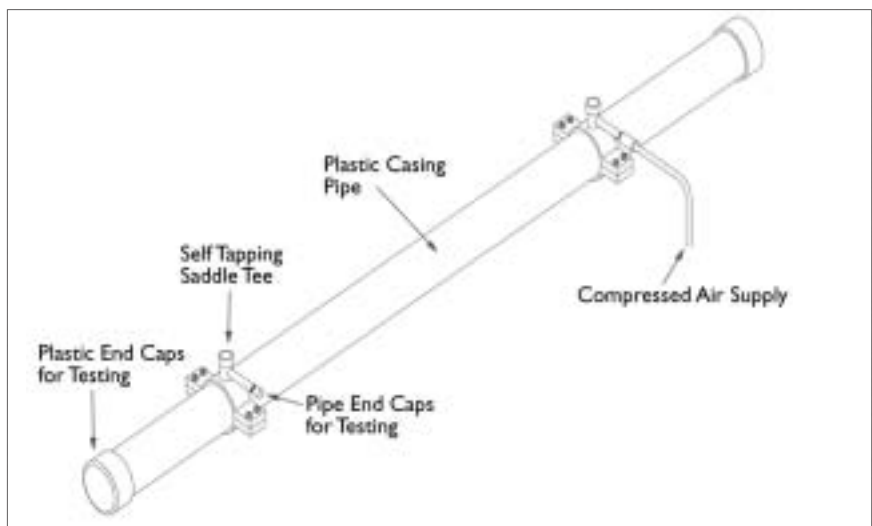


Figure 4. Testing of Encasement.

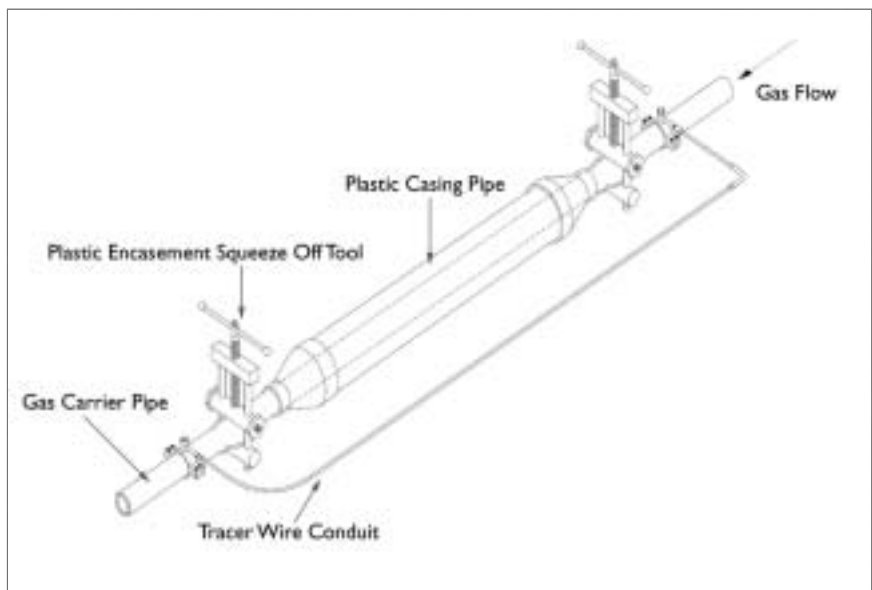


Figure 5. Bypass Operations.

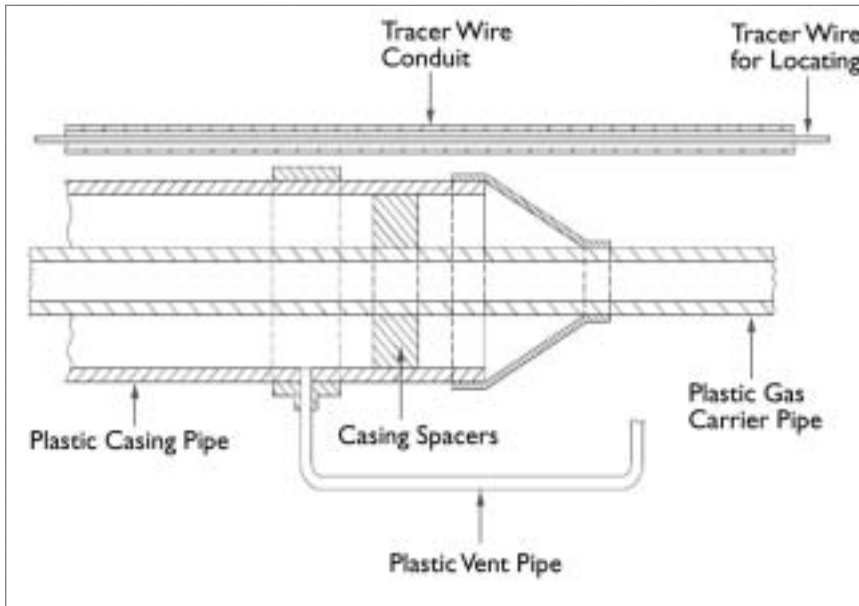


Figure 6. Tracer Wire Protection

replacement of the carrier pipe while maintaining operations to the natural gas customers. This will also reduce the need for additional bores under the roadways for future installations. (See Figure 5.)

- Tracer Wire Protection—The tracer wire conduit will allow the locating wire to be replaced if a lighting strike

damages the wire. Secondly, if a lighting strike does hit the tracer wire, no damage will be extended to the plastic encasement. This will promote the long-term integrity of the encasement and protect the integrity of the roadbed. This will also comply with USDOT Alert Notice 92-01. (See Figure 6.)

- Additional Depth/PVC Vent Pipe—Additional depth will reduce the potential for road maintenance workers to create a hazardous condition due to accidental dig-ins. Extension of the plastic encasement would provide one more level of protection for road maintenance workers. PVC vent pipe will improve the safety of the traveling public due to the reduction of potential personal injury and damage to vehicles. PVC vent pipe will also reduce potential damage to the road maintenance crews during bush-hogging operations. If PVC vent pipe is hit during grass cutting operations, PVC will absorb the force and shatter on site.
- Reduced Costs to Governmental Agencies—Some governmental agencies are responsible for relocation expenses of natural gas appurtenances in the road right-of-way. Plastic encasement could reduce the expense of an encasement installation for the agency. This could also be included in the roadway contract to reduce any delays associated with the relocation of the natural gas facilities and therefore, reduce the potential expense of delay charges. **GE**