DIRECT TAPPING OF DUCTILE IRON PIPING ENCASED IN POLYETHYLENE

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Introduction

DIRECT SERVICE tapping of operating Cast and Ductile Iron piping systems has been a common practice for more than 100 years. For the last 40 years, more and more direct taps have been performed on polyethylene-encased iron pipe. Generally, polyethylene-encasement of Ductile Iron piping is limited to corrosive environments where the need for protection is warranted. Thus, it is essential that the integrity of the polyethylene be maintained.

When making service connections, unrepaired damage to the polyethylene in the form of rips or tears may result in accelerated corrosion if low-resistivity soils are coupled with the bimetallic connection of copper and iron. The grounding of household electrical services to copper water service lines, which is not recommended under any circumstances, may also exacerbate the situation.

The following recommended procedure is offered to assist in assuring the quality of the polyethylene protection when making direct service connections.

Methods of Tapping Polyethylene-encased Ductile Iron Pipe

Method #1
The preferred method consists of applying two or three wraps of polyethylene adhesive tape completely around the pipe to cover the area where the tapping machine and chain will be mounted. This method minimizes possible damage to the polyethylene during the direct tapping procedure. After the tapping machine is mounted, the corporation stop is installed directly through the tape and polyethylene. Experience has shown that this method is very effective in eliminating damage to the polyethylene encasement. After the direct tap is completed, the entire circumferential area should be inspected for damage and repaired.

Method #2
A second method is direct tapping through the polyethylene film without applying a layer of tape on the encasement. Simply mount the tapping machine directly on the polyethylene-encased pipe and install the corporation stop using normal tapping procedures. Again, once the direct service connection is completed, repair all polyethylene that may have been damaged during the procedure. Take special care to inspect the bottom of the encased pipe where the mounting chain has been in contact with the polyethylene.

Method #3
The third–and least favored–method consists of making an X-shaped cut in the polyethylene and temporarily folding back the film at the point where the corporation stop will be installed. Then mount the tapping machine over the exposed pipe surface and make the service tap. After the tap is made and the corporation installed, remove the tapping machine and repair the X-shaped cut with polyethylene-compatible adhesive tape.

Before backfilling, inspect the polyethylene around the exposed circumferential area, particularly at the bottom where the mounting chain has been in contact with the polyethylene, to ensure that all damage is repaired.

Additional Considerations

House Services
As an added safeguard against dissimilar metal corrosion at service connections to polyethylene-encased iron pipe, the attendant corporation stop and a minimum clear distance of three feet of the copper service should be wrapped with polyethylene or a suitable dielectric tape.

Grounding household electrical services to the copper water service line can result in stray current corrosion of the copper service and/or the Ductile or Cast Iron main. The American Water Works Association (AWWA) has issued a policy statement that opposes grounding electrical systems to pipe systems conveying drinking water to a customer's premises. AWWA further states that interior piping systems can be connected to an electrical service neutral and to a separate grounding electrode if these systems are electrically insulated from the water utility's pipe system.

The Ductile Iron Pipe Research Association (DIPRA) endorses this AWWA policy and recommends that water utilities require that metallic service lines be electrically insulated from the pipe system.

Summary

Polyethylene encasement as outlined in the ANSI/AWWA C105/A21.5 Standard has proved to be an effective, economical corrosion protection system for Cast and Ductile Iron pipe in corrosive environments. As with all corrosion protection systems, proper installation is vital to its success.

By implementing the methods outlined above, direct service connections to polyethylene-encased iron pipe can be made without compromising the corrosion protection afforded.

Method#1

To perform the preferred method of tapping polyethylene-encased Ductile Iron pipe, wrap two or three layers of polyethylene-compatible adhesive tape completely around the pipe to cover the area where the tapping machine and chain will be mounted.

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Mount the tapping machine on the pipe area covered by the polyethylene tape. Then make the tap and install the corporation stop directly through the tape and polyethylene.

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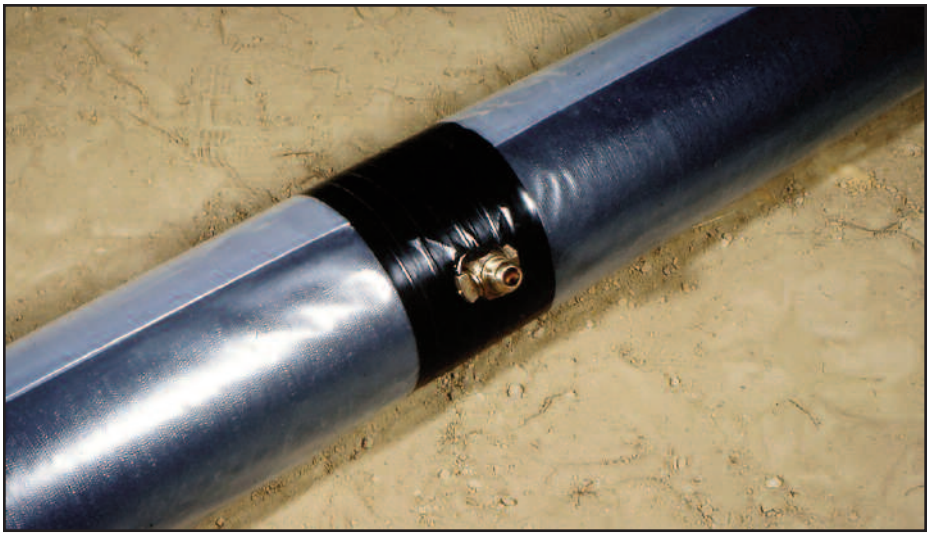
After making the direct service connection, inspect the entire circumferential area for damage and make any necessary repairs.



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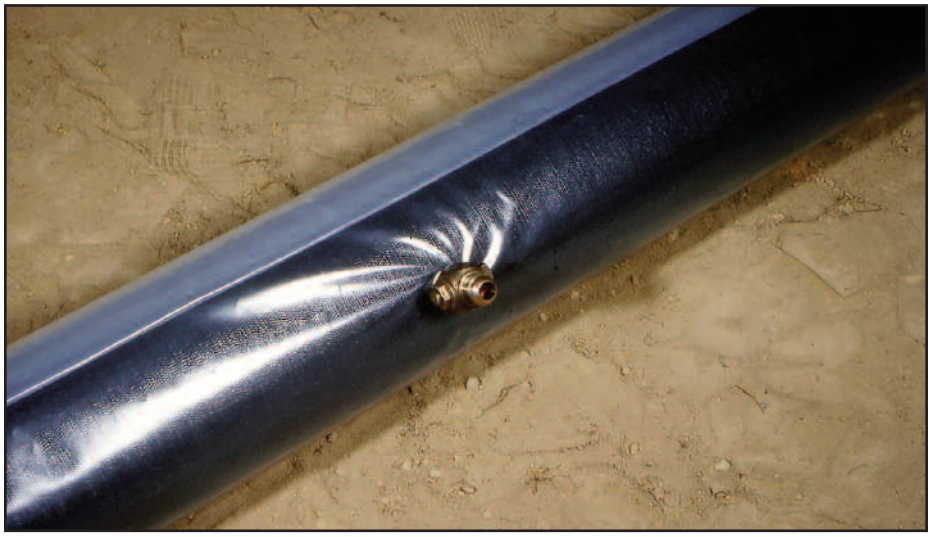
Method#2

The second method involves direct tapping through the polyethylene film without first applying a layer of tape. Mount the tapping machine directly on the polyethylene-encased pipe; then make the tap and install the corporation stop using normal procedures.



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After the tap is made, repair any polyethylene film that may have become damaged during the procedure. Be sure to inspect the bottom of the encased pipe where the mounting chain was in contact with the polyethylene.

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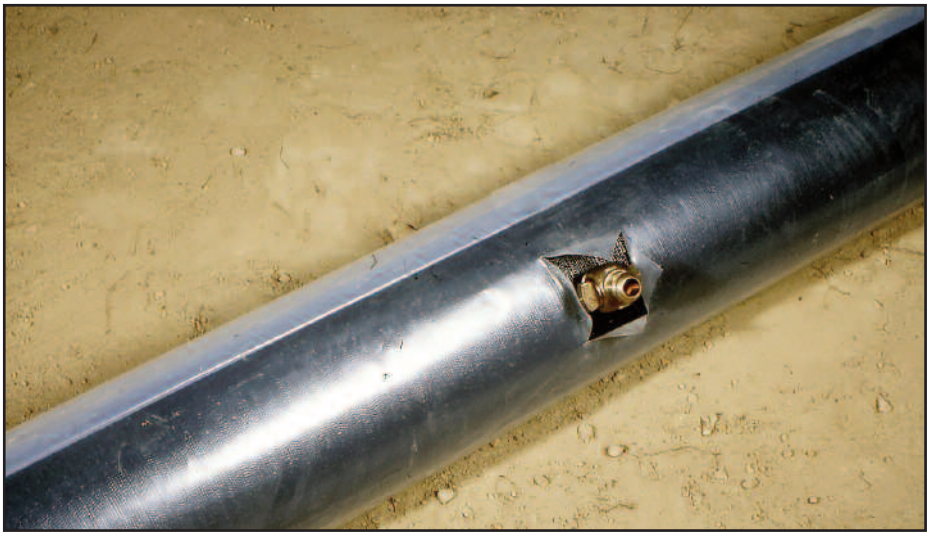
Method#3

To complete the third–and least favored–method, make an X-shaped cut in the polyethylene and temporarily fold back the polyethylene film at the point where the corporation stop will be installed.

Make the tap through the X-shaped cut, then remove the tapping saddle from the pipe.



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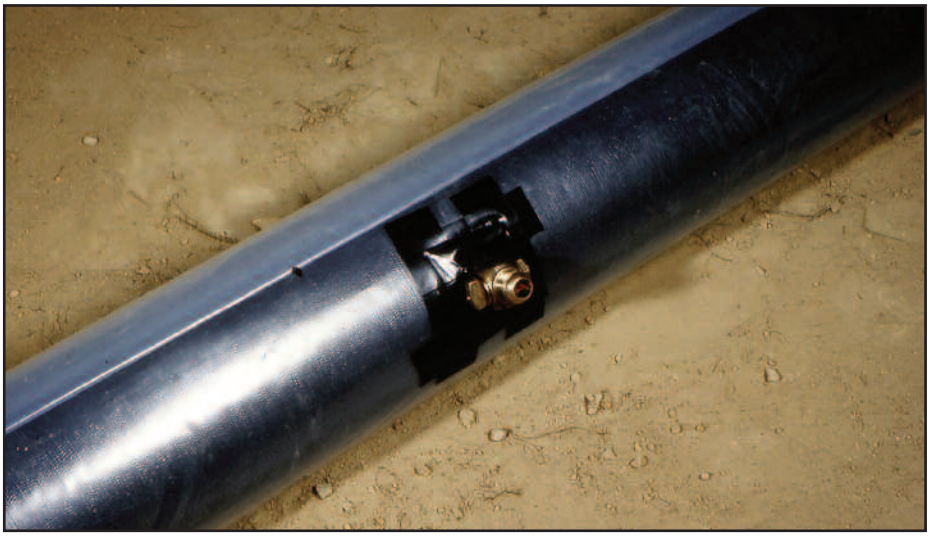
Repair the X-shaped cut with polyethylene-compatible adhesive tape. Be sure to inspect the bottom of the encased pipe where the mounting machine was in contact with the polyethylene and make any necessary repairs.



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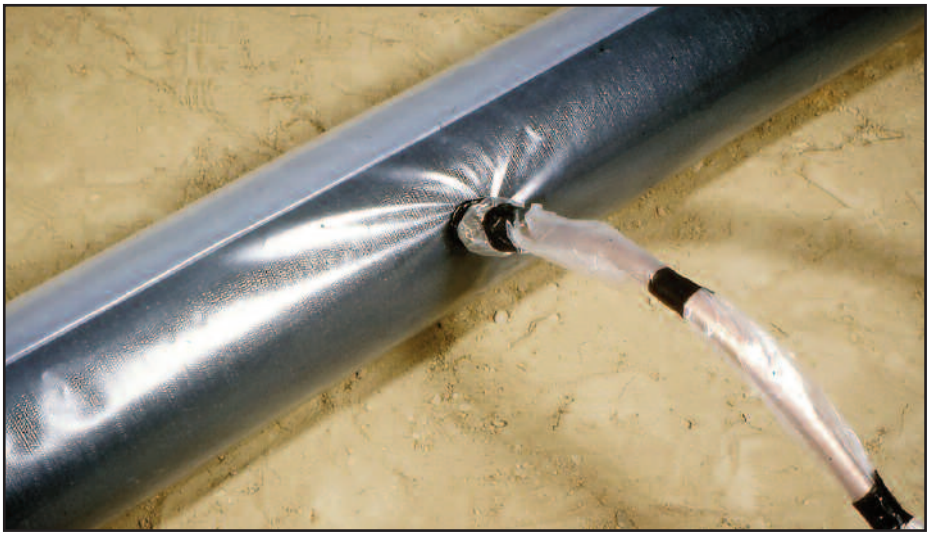
House Services

To minimize the possibility of dissimilar metal corrosion at service connections, wrap the corporation stop and a minimum clear distance of three feet of the copper service with polyethylene or a suitable dielectric tape.



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