

TECHNICAL BULLETIN



Conduit Handling Procedures for Field Forces

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1.0 GENERAL INFORMATION

- 1.1 HDPE (High Density Polyethylene) conduit is the preferred product when building a cable pathway, in both inside and outside environments. The flexibility and scalability allows a wide variety of installations to be performed smoothly, without time consuming joints placed every 20 feet, such as in stick conduit.
- 1.2 HDPE conduit is typically shipped on reels which can accommodate extended continuous lengths. Standard SDR, SIDR, Schedules 40 & 80, single MicroDuct, and FuturePath® are all shipped this way, and Dura-line has developed suggested guidelines for handling HDPE conduit when shipped on a reel, and used in the outside or inside environments.
- 1.3 HDPE is a plastic pipe, and will form a memory when placed on a reel. While not exactly spring-like, it will exhibit coiling once pulled from a reel. Following recommendations will help to curb some of the issues due to coil memory. Larger diameter conduit will take some care to uncoil, as the more plastic material in the product, the more memory will be observed. Technical Bulletin DCEB-17002 can provide additional information on these procedures.

2.0 RECOMMENDATIONS

- 2.1 Dura-Line HDPE products are shipped via private trucking companies, and may be subject to damage once the reels leave the manufacturing facility. Inspect reels prior to removal from the truck, if possible, for damage. Damage can occur due to improper forklift use, or poorly secured reels which cause damage to the HDPE. Lift reels by supporting the flanges, or sides of the reel. Do not put the weight of the HDPE and reel against the bottom layer of the conduit, to avoid flattening or crushing (Figure 1).



Figure 1

- 2.2 Reels should arrive shipped upon flat bed trailers in a vertical position. Reels

shipped or stored flat may exhibit entanglement of the conduit. Inspect for forklift or other damage before removal from truck (Figure 2).



Figure 2

- 2.3** Dura-Line ships various size reels depending upon the type of product and length ordered (Figure 3). Order acknowledgements include reel dimensions of each shipment. Installers can plan their installations to determine which reel-handling trailer or device is needed for the pending job. Steel, wooden, or plastic reels are utilized by Dura-Line. Reels should be loaded on trailers, trucks, or stands equipped with locking collars for the spindle used, to keep reels from travelling side-to-side.

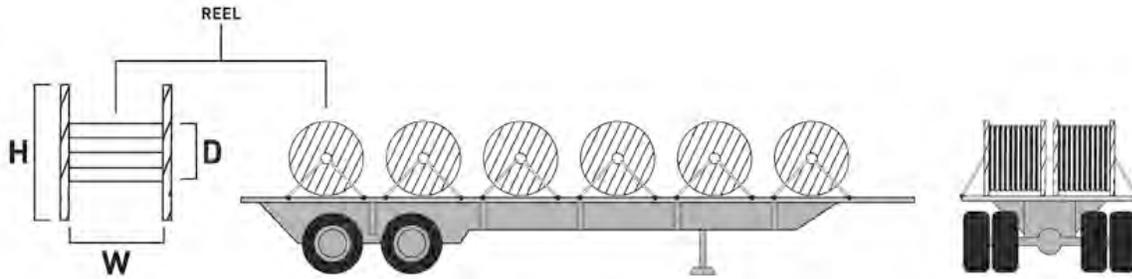


Figure 3

- 2.4** When pulling conduit from a reel, ensure the inner wraps of product remain tightly turned. Over-pulling, or spinning the reel too quickly can result in excess slack, which can equate to twisting or tangling of the conduit during pull off operations. Tangling can lead to kinking of the conduit, which should be cut at that point and the kink discarded. To form a bend in conduit, slowly push the conduit into a tight bend without exceeding the minimum or supported bend radius, or static bend radius published. When pulling out product, or installing into position, maintain the dynamic or unsupported bend radius. Tighter supported bend radii may be formed prior to final positioning of the conduit (Figure 4).

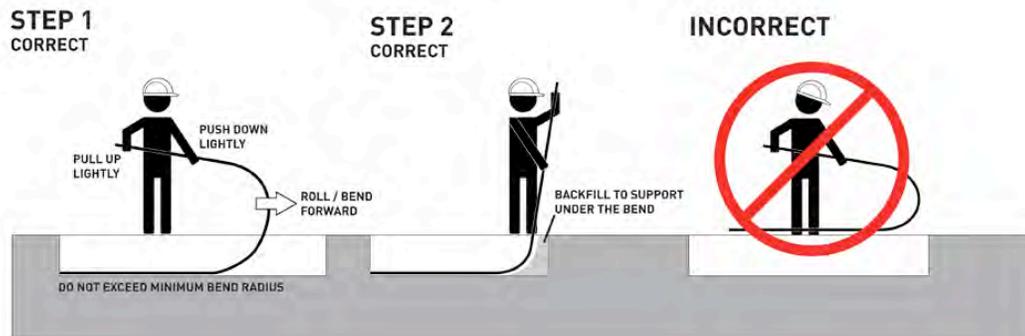


Figure 4

- 2.5** Excess bends during installation can increase friction or drag, and will affect cable installations. Before back-filling any trench, pull the HDPE tight and push to one side of the trench bottom, anchoring it with soil (Figure 5). Make sure backfill is clean and free of large rocks. Rocks should be no larger than half the diameter of the product being installed. This should be maintained as a layer surrounding the HDPE for several inches. After about 12 inches of back-fill have been placed, larger rocks can be re-introduced into the trench.

ANCHOR THE DUCT PERIODICALLY
TO KEEP IT AS STRAIGHT AS
POSSIBLE IN THE TRENCH



Figure 5

- 2.6 At times or in colder temperatures, HDPE may be more difficult to work with, showing more reel set or memory. Pull the HDPE straight into a trench, which has been graded or flattened on the bottom, and after the removal of large or jagged rocks (Figures 6-8).

INCORRECT



CORRECT



Figures 6-8

- 2.7 Load reels so that the HDPE follows the natural bend into the trench or outer conduit. This will be where the conduit feeds from the bottom of the reel. For reverse bend installation, load the reel so that the HDPE feeds off the top of the reel, again, following the natural bend of the conduit. Line up the reel prior to pullout so that it feeds directly into the trench, avoiding any rubbing or entanglements. It is recommended to station an installer at the reel during pullout, to watch for entanglements or overspin of the reel (Figure 9).

Derailments can occur as well, especially when a reel is nearly full, which is where the HDPE loop jumps over the reel side or flange, and can then kink on the spindle or other reel handling structure.

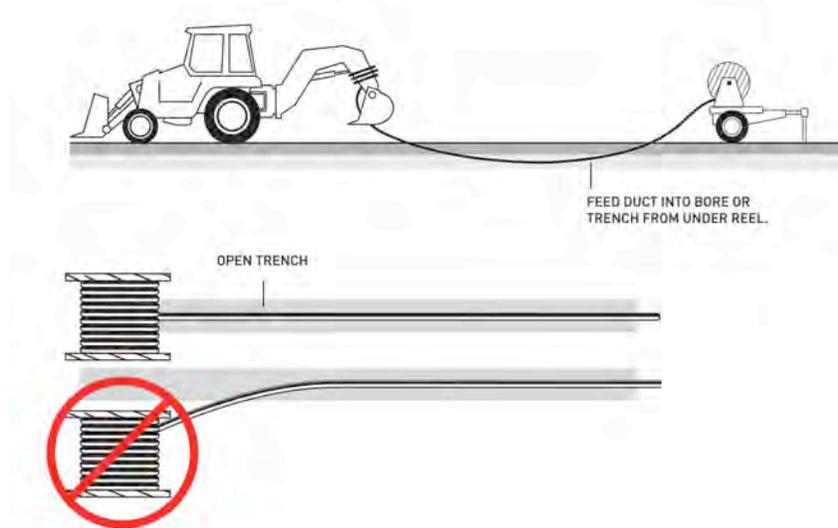


Figure 9

- 2.7 When pulling out conduit around obstructions, avoid twisting or kinking the HDPE. Utilize a swivel to keep twists out, and maintain tension during the pull-out so the HDPE does not recoil and allow kinking to occur. Maintain recommended bend radii during movement around obstructions, to avoid kinking (Figures 10 & 11).



Figure 10



Figure 11

- 2.8** Crushed HDPE may affect the cable placement by minimizing the ID (Inside Diameter) of the product. Avoid this by always keeping the HDPE tight on the reel, especially during transport from one location to another. Take a short section (10-15) feet of Bull-line® and half hitch a knot onto the end of the conduit. Use tape to secure the Bull-line to the conduit wall. Work the slack out of the HDPE towards the outer end, and secure the tail to the reel flange (Figure 12).



Figure 12

While HDPE is very robust and flexible, it is easy to become overconfident in the conduit's ability to withstand abuse. Even HDPE can become damaged or unusable if care is not taken during installation. It is hoped these guidelines are helpful to any installer of HDPE. The following chart describes some typical Dura-Line products and the recommended minimum bend radii during installation, and post installation (Table A).

DESCRIPTION	NOMINAL DIMENSIONS	BEND RADIUS UNSUPPORTED	BEND RADIUS SUPPORTED *
12.7mm x 10mm 7-way FuturePath	1.64" O.D.	30"	15"
18mm x 14mm 4-way FuturePath	1.86" O.D.	32"	16"
22mm x 16mm 7-way FuturePath	2.62" O.D.	52"	26"
1.25" SDR-11	1.660" O.D.	34"	17"
1.50" SDR-11	1.900" O.D.	38"	19"
2" SDR-13.5	2.375" O.D.	58"	29"
3" SCHED 80	3.500" O.D.	78"	39"
4" SDR-11	4.500" O.D.	100"	50"
6" SDR-11	6.625" O.D.	146"	73"
8" SDR-13.5	8.625" O.D.	233"	155"
16mm x 12mm MicroDuct	0.63" (16mm)	12"	6"
12.7mm x 10mm MicroDuct	0.050" (12.7mm)	10"	5"
8.5mm x 6mm MicroDuct	0.33" (8.5mm)	6"	3"

*SUPPORTED; after installation has occurred, and conduit is in its final position

Table A

3.0 CONTACT INFORMATION

- 3.1 Dura-Line Customer Service 1-800-847-7661 or 1-865-218-3460
Fax 1-865-218-3461
- 3.2 Web: www.duraline.com
- 3.3 Email: moreinfo@duraline.com
- 3.4 For further information on this product, contact Customer Service who can arrange for a Field Support Engineer to contact you directly.
- 3.5 Dura-Line has a library of Technical Bulletins that are for use by our customers and their placing crews.