

**GUIDED HORIZONTAL DRILLING SYSTEM (HDD) (CONTINUED)**

**PVC AND HDPE MATERIAL SPECIFICATION**

**TABLE 1  
RESIN PROPERTIES  
(THE RESIN PROPERTIES SHALL BEET OR EXCEED THE VALUES LISTED BELOW FOR HDPE.**

SDR 13.5-ASTM D3035/F2160/NEMA TC-7

| ASTM TEST | DESCRIPTION   | VALUES HDPE |
|-----------|---|-------------|
| D-1505    | DENSITY g/CM <sup>3</sup>   | .941-.951   |
| D-1238    | MELT INDEX. g/10 MIN CONDITION E                                  | .05-.50     |
| D-790     | FLEXURAL MODULUS, MP <sub>a</sub> (PSI)                           | 80,000 MIN  |
| D-638     | TENSILE STRENGTH AT YIELD (PSI)                                   | 3000 MIN    |
| D-1693    | ENVIRONMENTAL STRESS CRACK RESISTANCE CONDITION B,F <sub>10</sub> | 96 HR.MIN.  |
| D-746     | BRITTLINESS TEMPERATURE   | -75°C       |

**TABLE 2  
HDPE SPECIFICATION  
STANDARD LENGTH AND SIZE - REELS AND COILS FOR HDPE**

| NOM. SIZE | NOM. ID | NOM.OD OD | MIN.WALL OD | WEIGHT 100 FT. | PULL TENSILE SAFE LBS. | COLOR | TYPE | WALL     | REEL SIZE | REEL LENGTH (FT.) NOTE 5 | FULL WT./EA. (LBS.) REEL |
|-----------|---------|-----------|-------------|----------------|------------------------|-------|------|----------|-----------|--------------------------|--------------------------|
| 3"        | 2.982   | 3.500     | 0.259       | 113.120        | 2945                   | BLACK | S/S  | SDR 13.5 | 96X45X68  | 1000                     | 1364                     |
|           |         |           |             |                |                        |       |      |          | 102X54X64 | 1500                     | 1945                     |
|           |         |           |             |                |                        |       |      |          | 114X45X85 | 1500                     | 2100                     |
| 5"        | 4.738   | 5.562     | 0.412       | 285.394        | 7444                   | BLACK | S/S  | SDR 13.5 | 114X45X85 | 480                      | 1842                     |
|           |         |           |             |                |                        |       |      |          | 120X45X78 | 550/750                  | 2087/2637                |
| 6"        | 5.643   | 6.625     | 0.491       | 405.869        | 10566                  | BLACK | S/S  | SDR 13.5 | 120X45X85 | 450/500                  | 2296/2525                |

**TABLE 3  
SCHEDULE 40 PVC SPECIFICATION**

| NOM. SIZE | NOM. ID | NOM.OD OD | MIN.WALL WALL | WEIGHT 100 FT. | PULL TENSILE SAFE LBS. |
|-----------|---------|-----------|---------------|----------------|------------------------|
| 3"        | 3.068   | 3.500     | 0.216         | 95.591         | 2488                   |
| 5"        | 5.046   | 5.562     | 0.258         | 184.410        | 4801                   |
| 6"        | 6.065   | 6.625     | 0.280         | 239.415        | 6233                   |

**NOTES:**

- 1) HDPE DUCT IS SMOOTH WALL TYPE. SMOOTH INTERIOR AND SMOOTH EXTERIOR.
- 2) ALL REELS AND NON-RETURNABLE STEEL REELS
- 3) ASTM F 2160 - SOLID WALL HIGH DENSITY POLYETHYLENE (HDPE) CONDUIT BASED ON CONTROLLED OUTSIDE DIAMETER (OD).  
ASTM D 2239 - POLYETHYLENE (PE) PLASTIC PIPE (SIDR) BASED ON CONTROLLED INSIDE DIAMETER.  
ASTM D 3035 - POLYETHYLENE (PE) PLASTIC PIPE (SDR) BASED ON CONTROLLED OUTSIDE DIAMETER.  
NEMA TC-7 - SMOOTH WALL COILABLE POLYETHYLENE ELECTRICAL PLASTIC CONDUIT.
- 4) S/S - SMOOTH INSIDE SURFACE AND SMOOTH OUTSIDE SURFACE.
- 5) LENGTHS ARE ±10%.

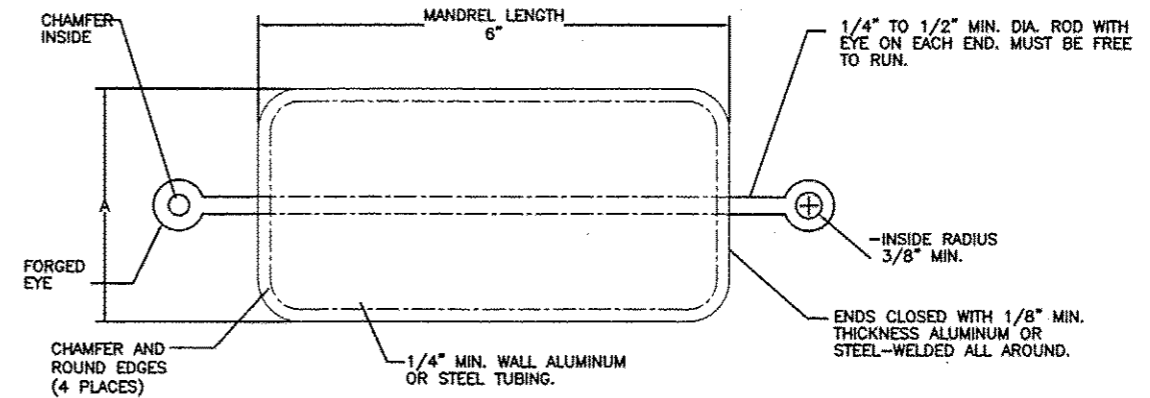
PULL TENSILE SAFE=BASED ON PLASTIC PIPE INSTITUTE TENSILE CALCULATIONS AND MAXI MAXIMUM TENSILE STRESS RECOMMENDATION OF 1/3 YIELD TENSILE FOR PULLS OF 30 TO 60 MINUTES APPLICATIONS AND PULLING.

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| NAPERVILLE PUBLIC UTILITIES DEPARTMENT<br>ELECTRIC STANDARDS | SPECIFICATION FOR THE INSTALLATION OF HDPE CONDUIT BY THE HORIZONTAL DRILLING SYSTEM (HDD) | DATE: 02-19-08<br>PAGE: 23 OF 25<br>C30-1950 |
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**GUIDED HORIZONTAL DRILLING SYSTEM (HDD) (CONTINUED)**

**MANDREL**

CONTRACTOR TO PROVIDE THE FOLLOWING MANDREL.  
CONTRACTOR TO FABRICATE OR PURCHASE MANDREL PER THIS DRAWING



**CONDUIT MANDREL DATA**

| NOM. CONDUIT SIZE | DIMENSION "A" (MANDREL LENGTH) |         | WEIGHT (LBS) |
|-------------------|--------------------------------|---------|--------------|
|                   | TYPE I                         | TYPE II |              |
| 3"                | 2-3/4"                         | 2.375"  | 2            |
| 5"                | 4-3/4"                         | 4.400"  | 3            |
| 6"                | 5-3/4"                         | 5.263"  | 4            |

- 1) TYPE I MANDRELS ARE USED IN SCHEDULE 40 PLASTIC CONDUITS.
- 2) TYPE II MANDRELS ARE ONLY TO BE USED IN SCHEDULE 80 AND HDPE PLASTIC CONDUITS.
- 3) CONTRACTOR TO FURNISH 3", 5" OR 6" MANDRELS IN THE QUANTITY REQUIRED TO COMPLETE THE PROJECT.

AVAILABLE FROM:  
INWESCO, INC.  
746 N. CONEY AV.  
AZUSA, CA 91702  
PHONE: (626) 334-9304  
FAX: (626) 969-3404  
CONTACT: DON SWEETAPPLE

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| PROJECT TITLE<br><b>ROUTE 59 ROAD IMPROVEMENTS</b>             |                         |                                |                         |
| PROJECT DESCRIPTION<br><b>DETAILS AND STANDARDS</b>            |                         |                                |                         |
| ENGINEER<br>BCC  | DRAWING DATE<br>5-11-12 | DATE<br>4211,4212,4223         | SCALE<br>N.T.S.         |
| DESIGN BY<br>DL  | DRAWN BY<br>PSM         | REVISIONS DATE<br>N/A          | PROJECT #<br>EU-12      |
| CHECKED BY   | APPROVED BY             | CAD FILE<br>00606480010151.DWG | SHEET #<br>51 OF 63     |
| Naperville Department of Public Utilities<br>Electric Division |                         |                                | WORK REQUEST #<br>60468 |