*U.S. Fire Administration / National Fire Academy*

# Coffee Break Training

## Topic: Low Point Sprinkler Drains

Learning objective: *The student shall be able to calculate the volume of trapped sprinkler pipe requiring a low point drain.*

Auxiliary, or low point, drains are required in sprinkler systems where pipe is installed in a way that can't be drained back through the main drain.

When the water capacity of this isolated "trapped" pipe is more than 5 (18.9 L), but less than 50 gallons (189 L), the drain must be outfitted with a valve of 3/4-inch (19 mm) or larger and a plug, or a nipple and cap.

The following table provides the water-carrying capacity of 1 foot (304.8 cm) of pipe, based on actual internal pipe diameters.

| Diameter | | Schedule 40 | | Schedule 10 | | Diameter | | Schedule 40 | | Schedule 10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (in.) | mm | gal | L | gal | L | (in.) | mm | gal | L | gal | L |
| 3/4 | 19 | 0.028 | 0.106 | -- | -- | 3 | 76.2 | 0.383 | 1.450 | 0.433 | 1.640 |
| 1 | 25.4 | 0.045 | 0.171 | 0.049 | 0.185 | 3-1/2 | 89 | 0.513 | 1.941 | 0.576 | 2.180 |
| 1-1/4 | 32 | 0.078 | 0.296 | 0.085 | 0.322 | 4 | 102 | 0.660 | 2.500 | 0.740 | 2.801 |
| 1-1/2 | 38.1 | 0.106 | 0.401 | 0.115 | 0.435 | 5 | 127 | 1.040 | 3.940 | 1.144 | 4.330 |
| 2 | 51 | 0.174 | 0.659 | 0.190 | 0.720 | 6 | 152 | 1.501 | 5.681 | 1.649 | 6.241 |
| 2-1/2 | 63.5 | 0.248 | 0.939 | 0.283 | 1.071 | 8 | 203 | 2.66 | 10.068 | 2.776 | 10.507 |



Does the 40-foot-long (12.2 m) trapped branch line described below require a low point drain? Assume the sprinklers are attached directly to fittings on the branch line, and the pipes are joined with grooved fittings that add no extra water carrying capacity.

The branch line consists of 20 feet of 1-inch (25.4 mm) Schedule 10, 10 feet of 1-1/4-inch (32mm) Schedule 10 and 10 feet of 1-1/2-inch (38.1 mm) Schedule 40.

Solution:

| American Standard | Metric |
|---|---|
| 20 feet x 0.049 = 0.98 gallons | 20 feet x 0.185 = 3.7 liters |
| 10 feet x 0.085 = 0.85 gallons | 10 feet x 0.322 = 3.22 liters |
| 10 feet x 0.106 = 1.06 gallons | 10 feet x 0.401 = 4.01 liters |
| Total = 2.89 gallons | Total = 10.93 liters |

Therefore, this branch line configuration would not need an auxiliary drain like the one pictured. For more information, refer to NFPA 13, *Standard for the Installation of Sprinkler Systems.*