

**Elburn-Countryside Fire Protection District
ISO Rating Assistance for Pond and Stream Certification**

Project Needs from Developers for the Elburn-Countryside Fire Protection District:

1. **Pond Survey:**
 - i. **Scaled drawing of pond** design (as-built, if possible) determined by NFPA1142. -gallon minimum design volume for fire flow.
 - ii. **Cross section of pond** (as-built, if possible)Maximum 11 foot lift
 - iii. **Drawing of final development** displaying all structures and impervious areas
 - iv. **Geotechnical** soil boring logs
 - v. **Soil types** encountered during pond construction—sand, clay, silt; stratification
 1. **Payment of Geologist** fee review.
2. **All-weather access road** to drafting/hydrant point as described in the Elburn & Countryside Fire Protection District fire prevention ordinance IFC 2003 appendix.
 - **Approval of site** by fire prevention bureau.
3. **Sufficiently-designed bridges** for water transport.
4. **Drafting Hydrant:**
 - i. **Submittal** of stamped plans for review.
 - ii. **Payment of Permit** for approval fire hydrant review.
 - iii. **Approval of site** by fire prevention bureau.
 - iv. **Permit issuance** per fire code from Elburn & Countryside Fire Protection District Fire Protection Ordinance 2005-100 (IFC 2003. 105.7Construction permits. 105.7.9 Private fire hydrants.
 - v. **Approved installer** by the Elburn & Countryside Fire Protection District for the all dry drafting hydrants for both fire protection ponds and fire protection cisterns within the Elburn & Countryside Fire Protection District.
 - vi. **Purchase of drafting hydrant head** and intake port approved by the Elburn & Countryside Fire Protection District for installation of fitting designed for use by the Elburn & Countryside Fire Protection District fire vehicles.
 - vii. **Installation of dry hydrant(s):**
 1. Meeting NFPA 1142 standards &
 2. Elburn & Countryside Fire Protection District requirements fire prevention ordinance IFC 2003 appendix.
 - ii. **Inspections** shall be performed throughout the installation.
 1. Site preconstruction
 2. Open trench
 3. Covered pipe
 4. Flow test
 5. At final
 - iii. **Elevation verification:**
 1. Elevation of top of strainer to confirm planned elevation.
 2. Elevation of top of hydrant to confirm planned elevation.
 - iv. **Testing of drafting hydrant** at a required flow rate of 1000 g.p.m. for fire protection of the buildings in the area.
 - v. **Paint** all Schedule 40 PVC piping above ground **RED**.
 - vi. **Installation of fire hydrant signage** and addressing.
 - vii. **Access road** with an asphalt, concrete or other approved driving surface capable of supporting the imposed load of fire apparatus weighing at least 75,000 lbs. A minimum width 20 feet and 26 feet at the hydrant, a maximum grade of 8 percent.
5. **Water Use Easement Agreement** Statement signed by owner of private pond authorizing its use by Elburn & Countryside Fire Protection District returned to District Attorney for signing and filing at Kane County Zoning.
6. **Copy of the platted survey** showing pond for filing with Kane County Zoning for the easement agreement.

Design Features Checklist

Design factors are affected by:

- Required flow from the hydrant is 1000 gallons per minute
- Suitability of pipe materials
- Size and type of fire apparatus pumper that is available

The following design features are **required** for dry hydrants using PVC pipes:

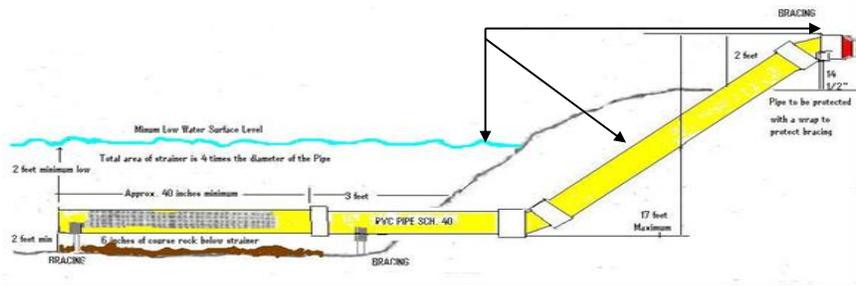
- **Minimum 8-inch-diameter pipes, schedule 40 pipe.**
- **Reduce size too 6" drafting hydrant head just prior to connection**
- **Prime and paint** all exposed pipe.
- Use a maximum of **(2) 45°** elbows.
- Properly join and cement all connections.
- Purchase a suction screen with adequate hole openings. The total area of strainer holes must exceed 4 times the area of the diameter of the pipe.
- Installation depth shall be below the frost-free depth for the area. (Consult local university extension service or Elburn & Countryside Fire Protection District Fire Prevention Bureau for frost depth.
- Install dry hydrant as close as practical to the water source.
- A flow of 1000 g.p.m from the hydrant is required.
- Designs with lifts in excess of 10 feet. (Above this height vapor pressure will begin to exceed atmospheric pressure and cavitation will occur, making pumping virtually impossible.)
- Place the pump at a higher elevation than the hydrant connection. (This will eliminate air bubbles which will limit flow, and also prevent the operator from getting wet.)
- When rock is encountered, installation must be adjusted to fit the rock profile. (Additional bends may be necessary.)

Other considerations:

- Each elbow in a dry hydrant installation increases friction loss. **The use of 45° elbows is required.**
- Does the site have proper drainage?
- Avoid vertical lifts of **more than 10 feet** with other than Class A pumps.
- PVC piping greater than two full sections will require additional personnel for installation.



6 to 10 ft. max. Static lift
As Approved by fire marshal



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Construction of Dry Hydrants

Installation starts with arranging for a large backhoe and at least three people to handle and place the pipe in the trench. An ideal time to start installation is in the late summer when the water is warm and usually at its lowest level. Haul clean fill material to the site. Choose material that will not wash out easily. Follow these installation steps:

- **Dig the trench.** Mark the backhoe arm with a ribbon to indicate the desired vertical depth. (This is helpful only when the ground is level.) Start excavating the ditch in the water and complete the entire horizontal section of the trench. Keep the bottom of the trench level all the way to the hydrant. (It is less complicated to maintain a level trench rather than a sloped one which requires figuring correct angles of joints.)



- **Cut the pipe to the desired lengths** and assemble. Check dry fit. As a rule of thumb, 6-inch-diameter pipe will not flow 1,000 g.p.m at horizontal lengths greater than 100 feet.
- **Prepare the joints.** It is required to use two 45-degree elbows for the riser joint instead of a single 90-degree elbow. If your hydrant connection is later broken off accidentally, the wider sweep of the 45-degree elbows would allow you to insert a 2 1/2-inch suction hose into the pipe. (Apply primer at this point, before glueing the joints.)



- **Join the pipe sections with glue.** Make sure you understand the technique, because timing is important. Use PVC cement; never use all-purpose cement to join PVC pipe and fittings. Joints must be held tightly together until both surfaces are firmly cemented. Do not disturb the joint until initial set occurs, which varies according to the temperature. Above 60 degrees, the recommended time is at least 30 minutes. Decrease the chance for an air leak by taping the joints with a rubberized, adhesive-backed wide tape. Attach the strainer with a collar or sleeve so that it can be removed if necessary.
- **Pressure test the joint** only after adequate curing according to the instructions for the particular cement. Do not take short cuts!

- **Carry the prepared piping to the trench.**



- **Force the strainer under water** until it fills the pipe. If more than 8 feet of pipe is out in the pond, a support bracket behind the strainer is required. Support can be as simple as stacked concrete blocks. The strainer must be 2 feet above the bottom of the pond so that the strainer holes will not be clogged with mud or other debris. Proper placement is necessary for successful operation of the dry hydrant.
- **Shoot elevation** of top of strainer to confirm planned elevation
- **Backfill around the pipe assembly**, starting with the riser, which should be covered during this operation to prevent rock and fill from falling into the pipe. Tamp the dirt for rigid support. Mound the fill material higher for more freeze protection. If extra insulation is needed, install a Styrofoam barrier around the pipe 2 to 3 feet under the surface.
- **Cut off the top of the riser** after measuring the distance from the bottom of the intake on the pump (positioned as it would be for pumping) to the ground. Cut off the riser so that when you attach the hydrant connection to the riser, the top of the opening of the hydrant connection is lower than the bottom of the pump intake. That is, the pump intake must be above the hydrant connection.
- **Shoot elevation** of top of hydrant to confirm planned elevation.
- **Paint (Red) all PVC piping** above ground for UV protection of piping.



- **Plant grass seed or other vegetation over the disturbed areas** to retard erosion. Mulching helps the seed or seedlings to get established.
- **Add any needed suction hose support** (especially if using 45-degree elbows) remember that connecting a suction hose and drafting through the dry hydrant connection places a lot of stress on the hydrant connection.
- **Place a sign** to identify the dry hydrant and warn people against parking or obstructing access. Paint the cap a reflective color for improved visibility during emergencies. If the exposed PVC is not sunscreen protected, the pipe must be painted to prevent chemical decomposition from ultraviolet light.