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## Residential / Commercial Cistern Specifications

1. The Town of Derry expects the design and construction of all cisterns which are to be turned over to and accepted by the Town to be trouble free and last a lifetime.

### **LOCATION**

2. Cisterns shall be spaced in accordance with the Land Development Control Regulations section 170-30.
3. Each cistern must be sited by a New Hampshire Registered Engineer or a Registered Surveyor and approved by the Fire Department, with all appropriate easements to the Town in place prior to construction.

### **CAPACITY**

4. The Derry Fire Department shall calculate the cistern capacity based on the largest building to be constructed within the development. The calculation shall derive from the latest edition of NFPA 1142, *Standard on Water Supplies for Suburban and Rural Firefighting*.
  - a. No cistern shall be constructed of less than 10,000 gallon capacity, and may require larger capacity for commercial applications.

### **DESIGN and INSTALLATION REQUIREMENTS**

5. The design of the cistern shall be submitted to the Fire Department for approval prior to construction. All plans submitted must be signed and stamped by a New Hampshire licensed/registered professional engineer.
6. The entire cistern shall be rated H-20 highway loading.
7. Bedding for the cistern shall consist of a minimum of 12 inches of  $\frac{3}{4}$  inch crushed, washed stone, compacted in a workman like manner. No fill shall be under the stone.

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8. The base of the cistern shall be designed in a manner that the cistern will not float when empty.
9. Cisterns shall be constructed out of concrete, gunite, fiberglass, or other material with prior approval of the Fire Department.
10. No cistern shall have a gasket or seam below the water level, based on the calculated capacity.
11. The concrete or gunite is to be mixed, placed and cured without the use of calcium chloride (CaCl<sub>2</sub>). Winter placement and curing must follow ACI codes as amended.
12. All suction piping shall be ASTM schedule 40 steel, 6 or 8 inches in diameter.
13. All steel pipe joints are to be welded. All PVC pipe joints are to be glued.
14. The suction pipe shall be connected to the bottom of the cistern with a 6 inch space above the floor of the tank.
15. The maximum length of the suction pipe from the bottom of the cistern to the Fire Department Connection is 18 feet.
16. The suction pipe shall be no more than 8 feet from the edge of the finished pavement and shall be supported to prevent the pipe from breaking when filled with water.
17. There shall be no landscaping installed which may interfere with the use of the cistern.
18. The suction piping system shall be capable of delivering a minimum of 1,000 gallons per minute for three quarters the capacity of the cistern.
19. The bottom threads of the suction pipe connection shall be installed at a level of 20 to 24 inches above final grade.
20. The finished suction connection shall have a 6 inch female connection with National Standard Threads complete with hydrant cap and chain.
21. Suction pipe shall be supported either at the top of the tank or at a level below frost.
22. The suction pipe shall be pitched slightly back toward the tank for proper drainage.
23. The fill pipe shall be ASTM schedule 40 steel and have a 4 inch storz connector with cap and 90 degree elbow. A downward elbow for the storz connector of no more than 45 degrees is acceptable.
24. All the cistern appurtenances, including the pipe bollards, shall be painted red.
25. The cistern shall have a visual float indicator for the water level.

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26. A permanent, weatherproof sign shall be installed indicating the capacity of the cistern in gallons.
27. To prevent damage from vehicles, cement filled pipe bollards are to be installed 2 feet from each side and 12 inches in front of the suction pipe. These columns shall be set in concrete 4 feet below grade and shall extend 12 inches above the suction pipe. Additional protection may be required for other cistern appurtenances as needed.

**TESTING and ACCEPTANCE**

28. The entire cistern is to be inspected by the Fire Department prior to backfilling.
29. The developer is responsible for filling the cistern until acceptance by the Fire Department. This includes refilling after a flow test has been conducted.
30. **No occupancy permits will be issued until the cistern is inspected, tested, and approved by the Fire Department**