



Laguna Beach Fire Department

UNDERGROUND PRIVATE FIRE SERVICE SYSTEM DESIGN, INSTALLATION & INSPECTION CHECKLIST

This checklist is provided by the Laguna Beach Fire Department (LBFD) for use by the licensed designer and/or licensed contractor to assist in the design or installation of the underground private fire service system and in preparation for the required LBFD inspections. This checklist is not to be construed as being all inclusive. The design and installation must comply with all applicable codes and standards in effect at time of plan submittal.

- 1) The underground private fire service design and installation shall comply with California Fire Code (CFC), National Fire Protection Association (NFPA) Standards 13 & 24, and the Laguna Beach Municipal Code (LBMC). The applicable LBMC amendments are included in this document and can be found on the City website.
- 2) Fire Construction Permits are required for private fire service underground systems and private fire hydrants.
- 3) All devices and equipment are required to be listed. Three copies of the specification sheets and/or installation listings are required to be included with each plan set.
- 4) All fire hydrants (public and private) required for this project must be active and/or placed in service prior to the delivery of combustible construction materials to the site. Hydrants must comply with Water District requirements for location and type. Water District and LBFD Inspectors will verify. Public hydrants will be permitted and inspected by the applicable Water District. The LBFD will permit and inspect all private hydrants.
- 5) All private fire hydrants must match public hydrants. Private hydrants, as well as the traffic box lid above the hydrant control valve, shall be painted entirely OSHA red. Install reflective blue marker in the street and protective curbs/bollards as per the CFC.
- 6) An underground private fire service line and connection to the Water District water main shall be provided for the private fire hydrants and a separate underground private fire service line and connection to the Water District water main provided for the fire sprinkler / standpipe systems.
- 7) The Fire Department Connection (FDC) shall be of an approved type and contain a minimum of two 2½ inch inlets. The location shall be approved and be no more than 150 feet from a fire hydrant. When serving a standpipe system, it can be no more than 100 feet from a hydrant. If acceptable to the Water District, it may be installed on the backflow assembly. The supply pipe and FDC shall be painted OSHA red. When the sprinkler density design is 500 GPM or greater (including the interior hose stream demand) or a standpipe system is included, four 2½" inlets shall be provided.
- 8) The FDC shall be on the street side of buildings, immediately discernible, fully visible and recognizable from the street or nearest point of fire department apparatus

accessibility. It must also be located where exposing fires will not affect access. It must have a clear area around the connections (5'0") accessible for fire apparatus equipment. It shall be located within 50 feet of an approved fire apparatus access roadway and arranged so that hose lines can be attached to the inlets without interference from nearby objects. The connections must be installed between 24 inches and 48 inches above finished grade.

- 9) FDC's shall use an NH internal threaded swivel fitting with an NH standard thread, where the connections shall be the "2.5-7.5 NH standard thread," as specified in NFPA 1963, Standard for Fire Hose Connections. FDC's shall be properly supported.
- 10) Each FDC for sprinkler systems or standpipes shall have a sign with raised or engraved letters at least 1 inch in height, and indicating service design.
- 11) Provide tamper switches and fire alarm system supervision for post indicator valves (PIV's) and backflow assembly Operating Stem and Yolk (OS&Y) valves.
- 12) All FDC's, PIV's and fire service backflow assemblies are required to have permanent signage of metal or rigid plastic indicating the address of building served. Signage must use a red background with white letters, be readily visible and securely mounted.
- 13) The OS&Y control valve (part of the backflow assembly) closest to the fire riser and all PIV's controlling fire suppression water supplies shall be painted OSHA red.
- 14) Depth of cover for underground piping shall be a minimum 3'0" in roadways and 2'6" in all other areas. This dimension is measured from the top of pipe to finish grade.
- 15) All piping shall be listed for fire protection service and comply with AWWA standards.
- 16) Pipe used in private fire service shall be designed to withstand a working pressure of 150 psi.
- 17) Buried fittings shall be of an approved type with joints and pressure class ratings compatible with the pipe used.
- 18) All ferrous pipes below ground shall be coated and wrapped. All joints shall be coated and wrapped after assembly. All fittings shall be protected with a loose 8 millimeter polyethylene tube. The ends of the tube shall extend past the joint by a minimum of 12 inches and be sealed with 2-inch wide tape approved for underground use. Galvanizing does not meet the requirements of this section. Exception: 316 Stainless Steel pipe and fittings.
- 19) All bolts used in pipe joint assembly shall be 316 Stainless Steel.
- 20) All bolted joint accessories shall be cleaned and thoroughly coated with asphalt or other corrosion-retarding material, prior to poly-tube, and after installation.
- 21) All rods, nuts, bolts, washers, clamps, and other restraining devices shall be cleaned and thoroughly coated with a bituminous or other acceptable corrosion-retarding material.

- 22) Where fire service mains enter the building adjacent to the foundation, the pipe may run under a building to a maximum of 18 inches as measured from the interior of the exterior wall. The pipe under the building or building foundation shall be 316 Stainless Steel and shall not contain mechanical joints.
- 23) Pipes, valves and fittings shall be inspected for damage prior to installation. Bolted joints shall be checked for proper torque. When work is stopped, open pipe ends shall be plugged to prevent stones and foreign materials from entering.
- 24) Water main materials shall not be dropped or dumped. Pipe shall not be rolled or skidded against other pipe materials.
- 25) Valves and fittings used with nonmetallic pipe (as installing) shall be properly supported and restrained in accordance with the manufacturer's specifications.
- 26) The LBFD recommends "tracing" of buried pipe (specifically if non-conductive piping is used) for future detection.
- 27) All tees, plugs, caps, bends, and branches shall be restrained against movement. Thrust blocks shall be an acceptable means where soil is suitable. They shall be placed between undisturbed earth with the fitting to be restrained and shall be of such bearing as to ensure adequate resistance to the thrust to be encountered.
- 28) When installing concrete thrust blocking the concrete mix shall be no leaner than one part cement, two and one-half parts sand, and five parts stone, then placed between undisturbed earth and the fitting to be restrained. It shall be of such bearing as to ensure adequate resistance to the anticipated pressure testing thrusts encountered.
- 29) Backfill shall be well compacted and installed in layers under and around pipe (puddled where possible) to prevent settlement or lateral movement, and shall contain no ashes, cinders, refuse, organic matter, other corrosive materials, or rocks.
- 30) If a trench is cut through rock, tamped backfill shall be used for at least 6 inches under and around the pipe for at least 2'0" above the pipe.
- 31) Provide four inches of clearance around the wall of the pipe penetrating floors and foundations per NFPA requirements. Piping that is run under footing shall be a minimum of 6 inches from top of pipe to bottom of footing in order to allow for settling. All underground piping that is run through the floor shall be 316 Stainless Steel.
- 32) Private fire service underground piping that is crossing or laid within the same trench as sewer or drain lines shall be at least 12 inches above those lines.
- 33) Before covering, the underground installation shall be witnessed by the LBFD inspector. Whenever any installation that is subject to inspection is covered or concealed without having first been inspected, the LBFD shall have the authority to require that such work be exposed for inspection.
- 34) The new underground private fire service system shall be hydrostatically tested in the presence of the LBFD inspector at not less than 200 psi pressure or 50 psi in excess of the system working pressure, whichever is greater, for a minimum of two (2) hours.

Test must be conducted prior to covering of fittings and shall include all FDC piping. Center loading of pipe to secure in place prior to inspection is acceptable.

- 35) Water flushing shall be witnessed by the LBFD inspector with all valves and/or appurtenances fully open and flowing. Water damage and erosion shall be avoided and flows should be contained onsite or directed to the sewer. Contact the Laguna Beach Water Quality Department for further information on discharge of water.
- 36) Fire sprinkler overhead system piping (separate permit) shall not be connected to this underground permitted work prior to its completion and the approval of system flush.
- 37) Backflow prevention assemblies shall have a means provided downstream of the last control valve for flow tests at maximum sprinkler system demands.
- 38) The backflow prevention assembly shall be forward flow tested to ensure the proper operation. This test must be conducted prior to final approval with a flow meter or pitot gauge.
- 39) All new private fire hydrants shall be flow tested during final inspection at the minimum calculated required hydrant flow. This test must be conducted with a flow meter or pitot gauge.
- 40) All control valves (new and existing) shall be fully closed and opened under the system water pressure to ensure proper operation.
- 41) At time of final inspection and approval, the contractor shall provide a "Contractor's Material and Test Certificate for Underground Piping." It shall be completed and signed by the Contractor and the Building Owner or Owner's Authorized Representative and given to the LBFD inspector. No final shall be approved without this document. (Reference 2016 NFPA 24, Figure 10.10.1)
- 42) Any installation deviating from, or exceeding the work scope of, the approved plans shall require re-submittal to and approval by the LBFD prior to final acceptance.
- 43) This project scope of work must conform to all applicable related fire code requirements, standards and ordinances in effect and/or noted on these plans unless specifically noted otherwise in writing by the LBFD.