Fire Chiefs Association of Santa Cruz County
FIRE PREVENTION OFFICERS SECTION

FIRE PREVENTION STANDARDS	DATE: **9/5/96**	NUMBER: **FP0-005**
	APPROVED:	REVISED: ~~3/26/2015~~
	TITLE: **13-D Systems on Public Water Supply**	

Guide to Fire Sprinkler Requirements For One and Two Family Dwellings

(Public Water Supply Systems)

These are the basic requirements for residential fire sprinkler systems compiled by the Fire Prevention Officers Section of the Santa Cruz County Fire Chief's Association.

The National Standard Utilized for residential fire sprinklers is the latest edition of NFPA 13D. Listed below are additional modifications required.

1) Plans shall be submitted and approved prior to installation to the Fire Prevention Office having jurisdiction. Design submittals shall include drawings and flow calculations for the entire system (underground and overhead). All system components including meter, control valve, check valve, flow switch, and pipe equivalents must be included for determination of total sprinkler system head loss. Allow a minimum of 14 days for plan check and approval.

2) The following information is required when submitting plans for a sprinkler system in a single or two-family residence.

3) Design and Installation Requirements
   a. NFPA 13D residential automatic sprinkler systems shall be **designed and hydraulically calculated** by a Fire Protection Engineer (F.P.E.), licensed C-36 or C-16 Contractor (if they install the system), or by an owner-builder of an owner-occupied single-family dwelling.
      (1) Scale ¼" = 1 foot. North arrow.
      (2) Dimensions and arrangement of rooms and partitions.
      (3) Systems shall be calculated to provide for a 10-pound residual.
   b. The sprinkler system shall be installed by a licensed C-36 or C-16 contractor or by an owner-builder of an owner-occupied single-family dwelling.
   c. The fire sprinkler system shall consist of the overhead and underground piping.
   d. Proof of registered professional license shall be submitted with plans and calculations.
   e. When field variations are made to Fire Department approved sprinkler plans, the contractor shall provide "As Built" plans and calculations to re-verify system demand requirements as installed prior to overhead rough inspection. **Insulation and wall/ceiling**

sheeting installations may be delayed if review of new plans and calculations is necessary.

SYSTEM DESIGN REQUIREMENTS

A. Water Supply

1) Check with applicable local water agency.
   a. Document on the plans:
      (1) The source of the water pressure information.
      (2) The date the test was completed.

   b. If test date exceeds 3 years, new test information will be required.

   c. If request is made to use the existing potable source then a bucket test must be performed by either the Water Department or the local fire authority having jurisdiction. Results must be submitted with the design submittal.

2) If the building site is outside of a local water agency service area, the minimum required amount of stored fire protection water for one and two family dwellings equipped with an automatic fire sprinkler system is 10,000 gallons, or as required by the local fire agency.

B. Requirements for Underground Installation

1) Pipe
   a. Underground pipes will be 2" or other sizing as approved by the authority having jurisdiction based on available water, square footage and hydraulic calculations: indicate on plans with a detail drawing. Future structural expansion should be considered when determining UG pipe size.

   b. Provide schedule 80 PVC fitting between meter and underground pipe.

   c. Minimum underground pipe depth is 18 inches below rough grade.

   d. Schedule 40 PVC or other listed and approved materials are allowed for underground supply line from the water source to the transition fitting. Schedule 80 PVC transition fitting to be installed a minimum of six inches below grade at the base of the riser.

   e. Underground piping will terminate with a threaded or glued cap at a minimum of six inches above finished grade.

      Note: This is the termination of the underground piping.

   f. **All pipe transitions from metal to plastic will be through schedule 80 plastic fittings.**

   g. **All piping from the transition fitting to the riser shall be approved metallic pipe. If copper pipe is used for extension, type "L" is required.**
      ***See Attachment A for diagram.**

2) Testing

a. All residential sprinkler system underground piping systems shall be hydrostatically tested in accordance with the requirements of the California Plumbing Code (not less than minimum design working pressure for 15 minutes) and shall be witnessed by the Fire Department prior to being covered.

b. Underground pipe shall be flushed with water at the minimum design pressure, **through an opening the size of the underground pipe's diameter**, until the water runs clear insuring the line is free of contamination before the underground pipe is connected to the riser. If the underground piping is not going to be connected to the riser immediately, the underground is to be secured with a threaded or glued cap.

c. Provide Contractor's Material and Test Certificate for underground piping at time of test. Template copies of underground and above ground certifications can be found in the most current edition of NFPA-13.

C. System Components

1) Valves and Drains

a. Control Valve: Control Valves shall be indicating valves and be UL or NFPA approved (i.e. O.S. & Y., butterfly valve, or full flow ball valve).

(1) An approved sign indicating "Control Valve" shall be located adjacent to the valve. Control valves installed on the riser must be supervised by one of the following:

(a) Securing the valve in the open position to the approval of the fire authority.

(b) Local alarm service that will cause the sounding of an audible signal at a constantly attended location.

(c) Central Station, proprietary or remote station alarm service.

b. Public Metered Water Systems

(1) Single Meter: (Fire x Domestic) Fire supply owner control valve shall be located at the base of the sprinkler riser. For **non-municipal water source** combination systems having control valves, the control valve must be located below the domestic supply tee.

(2) Double Meter: (2 separate meters – domestic and fire) Fire supply owner control valve shall be located at the base of the sprinkler riser.

c. Main Drain/Pressure Relief

(1) Main Drain shall be located above the flow switch.

(2) Adjustable pressure relief valves are required when the pressure exceeds 125 P.S.I.

(3) Main drain valves shall be an approved valve.

(4) An approved sign indicating "Main Drain" shall be located adjacent to the valve.

d. Flow Switch/Alarm

(1) 110-volt flow alarm with a minimum 6" bell located on an exterior master bedroom wall of the house. The design of the house may require more than one bell.

(2) Any exposed wiring to be installed in an approved weather resistant conduit and fittings. A drip loop to the flow switch is required.

(3) To be wired to a normally used circuit (i.e. refrigerator, master bedroom) not on a G.F.C.I. or A.F.C.I. (arc fault) protected circuit.

e. Check Valve
   (1) An approved rubber-seated double check valve is required either in the meter box or at the base of the sprinkler riser. Consult with local fire department for requirements. Include the manufacturer's "Cut Sheet" showing equivalent feet of pipe loss or PSI loss for the device.

f. Gauge
   (1) UL approved pressure gauge to have at least 200 PSI reading.

g. Riser Location/Construction
   (1) The riser shall be located on or adjacent to the garage or as approved by the local fire agency.
   (2) Riser to be constructed of approved metallic pipe if located on the exterior of the structure or unprotected on the interior of the structure.
   (3) Riser, if installed in the wall of the structure, shall have an access panel to the exterior with all valves and switches available through the panel when required by the fire code official. Unions should be used to facilitate repairs to the riser.
   (4) Control Valve and Main Drain signs shall be posted on the outside of the access panel door or on riser or structure if riser is exposed.

   ***See Attachment B for Riser Detail**

   ***See Attachment B-1 Riser with Domestic Tee for combination systems**

2) Overhead Piping
   a. Pipe & Sprinklers
      (1) Copper, Steel, CPVC and other listed and approved materials shall be used for interior sprinkler lines. All materials shall be installed per manufacturer and fire department requirements.
      (2) When attic access exits a pilot head shall be installed in the attic using a high temp commercial head and metallic pipe.
      (3) Heat source clearance for CPVC pipe shall be a minimum of 12 inches or manufacturer's recommendations.
      (4) Areas containing heat-producing equipment shall be protected by automatic fire sprinklers.
      (5) Attics, crawl spaces, or other non-habitable areas that are used for storage shall be protected by automatic fire sprinklers.

   b. Straps
      (1) All straps shall be UL listed for their use with the piping material used.
      (2) All straps shall be secured as per manufacturer's recommendations.

   c. Testing
      (1) All systems shall be hydrostatically tested at not less than 200 PSI for two hours or at least 50 PSI in excess of the maximum pressure, when the maximum pressure to be maintained in the system is in excess of 150 PSI. Proof of testing shall be provided and an approved gauge showing the test pressure of at least 200 PSI shall be witnessed by the fire department.
      (2) Sprinkler heads or plugs may be used for testing. The contractor is responsible for replacing damaged heads prior to final.

(3) Provide Contractor's Material and Test Certificate for overhead piping at time of test. A copy of the overhead piping certificate can be found in the most current edition of NFPA-13.

3) Inspector Test Assembly
   a. Valve
      (1) A UL approved ball valve shall be used for the inspector's test valve.

   b. Location/Construction
      (1) Inspector test assembly to be located at ground level piped from the most remote portion of the sprinkler system. Discharge should be located as not to cause damage to surrounding area with water flow.
      (2) Inspector test assembly to be constructed of approved metallic pipe if located on the exterior of the structure or unprotected on the interior of the structure.
      (3) Inspector test assembly, if installed in the wall of the structure, shall have an access panel to the exterior with all valves/gauge available through the panel.
      (4) A "spent" sprinkler head of the same size orifice used for the interior sprinkler heads with the frame cut off shall be used as a test orifice.
      (5) An approved sign indicating "Inspector's Test" shall be located adjacent to the valve.

4) Spare Sprinkler Head Box, Sprinklers & Sprinkler Head Wrench
   a. Spare sprinkler head box capable of holding a minimum of 6 sprinkler heads shall be installed in the vicinity of the sprinkler riser or as approved by the fire department.

   b. The spare head box shall contain:
      (1) A minimum of three of the predominant type of head and one of each other type used on the job.
      EXCEPTION: If only one type of head is used, only one head of that type will be required.
      (2) Sprinkler head wrench.

   c. The installing Fire Sprinkler Contractor shall affix a permanent decal or other identifying label to the face of the spare head box. Decal shall have company name and contact information.

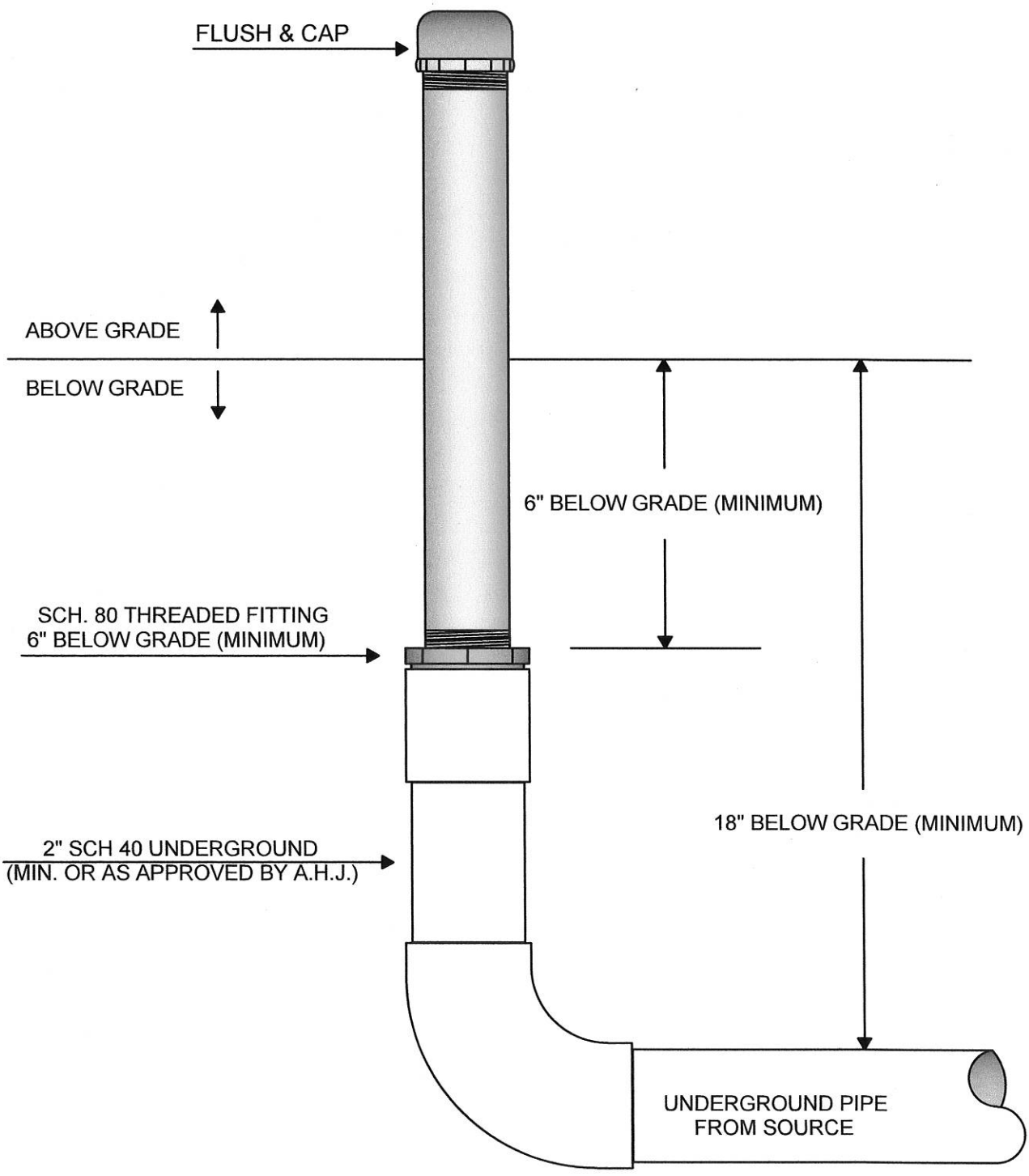
The appropriate local agency should be contacted regarding local requirements, permit process and fees. Refer to the attached table to determine which fire agency will oversee plan review, installation activities, perform compliance inspections and collect permit fees, if any. For those agencies marked with an (*) on the following table, CAL FIRE/Santa Cruz County Fire Department is the agency responsible for all aspects of the automatic fire sprinkler installations.

Location	Fire Agency Name	Address	Telephone
Aptos	Aptos/La Selva FPD	6934 Soquel Drive Aptos, CA 95003	(831) 685-6690
Ben Lomond	Ben Lomond FPD	9430 Hwy 9 Ben Lomond, CA 95005	(831) 336-5495
*Bonny Doon	CAL FIRE/ Santa Cruz County Fire Dept.	P.O. Drawer F-2 Felton, CA 95018	(831) 335-6748
Boulder Creek	Boulder Creek FPD	13230 Central Ave Boulder Creek, CA 95006	(831) 338-7222
Branciforte	Branciforte Fire Dept.	2711 Branciforte Dr. Santa Cruz, CA 95065	(831) 423-8856
Brookdale	Boulder Creek FPD	13230 Central Ave Boulder Creek, CA 95006	(831) 338-7222
Capitola	Central FPD	930 17th Ave. Santa Cruz, CA 95062	(831) 479-6843
*Corralitos	CAL FIRE/Santa Cruz County Fire Dept.	P.O. Drawer F-2 Felton, CA 95018	(831) 335-6748
*Davenport	CAL FIRE/Santa Cruz County Fire Dept.	P.O. Drawer F-2 Felton, CA 95018	(831) 335-6748
Felton	Felton FPD	131 Kirby St. Felton, CA 95018	(831) 335-4422
*Freedom	Pajaro Valley Fire District	P.O. Drawer F-2 Felton, CA 95018	(831) 335-6748
La Selva Beach	Aptos/La Selva FPD	6934 Soquel Drive Aptos, CA 95003	(831) 685-6690
Live Oak	Central FPD	930 17th Ave. Santa Cruz, CA 95062	(831) 479-6843
Mount Herman	Felton FPD	131 Kirby St. Felton, CA 95018	(831) 335-4422
Pajaro Dunes	CAL FIRE/Santa Cruz County Fire Dept.	P.O. Drawer Felton, CA 95018	(831) 335-6748
Rio Del Mar	Aptos/La Selva FPD	6934 Soquel Drive Aptos, CA 95003	(831) 685-6690
*Salispuedes	Pajaro Valley Fire District	P.O. Drawer F-2 Felton, CA 95018	(831) 335-6748
Santa Cruz City	Santa Cruz FD	230 Walnut St. Santa Cruz, CA 95060	(831) 420-5280
Scotts Valley	Scotts Valley FPD	7 Erba lane Scotts Valley, CA 95066	(831) 438-0211
Soquel	Central FPD	930 17th Ave. Santa Cruz, CA 95062	(831) 479-6843
Watsonville	Watsonville FD	115 2nd St. Watsonville, CA 95076	(831) 768-3200
Zayante	Zayante FPD	7700 East Zayante Rd. Felton, CA 95018	(831) 335-5100

ATTACHMENT 'A'

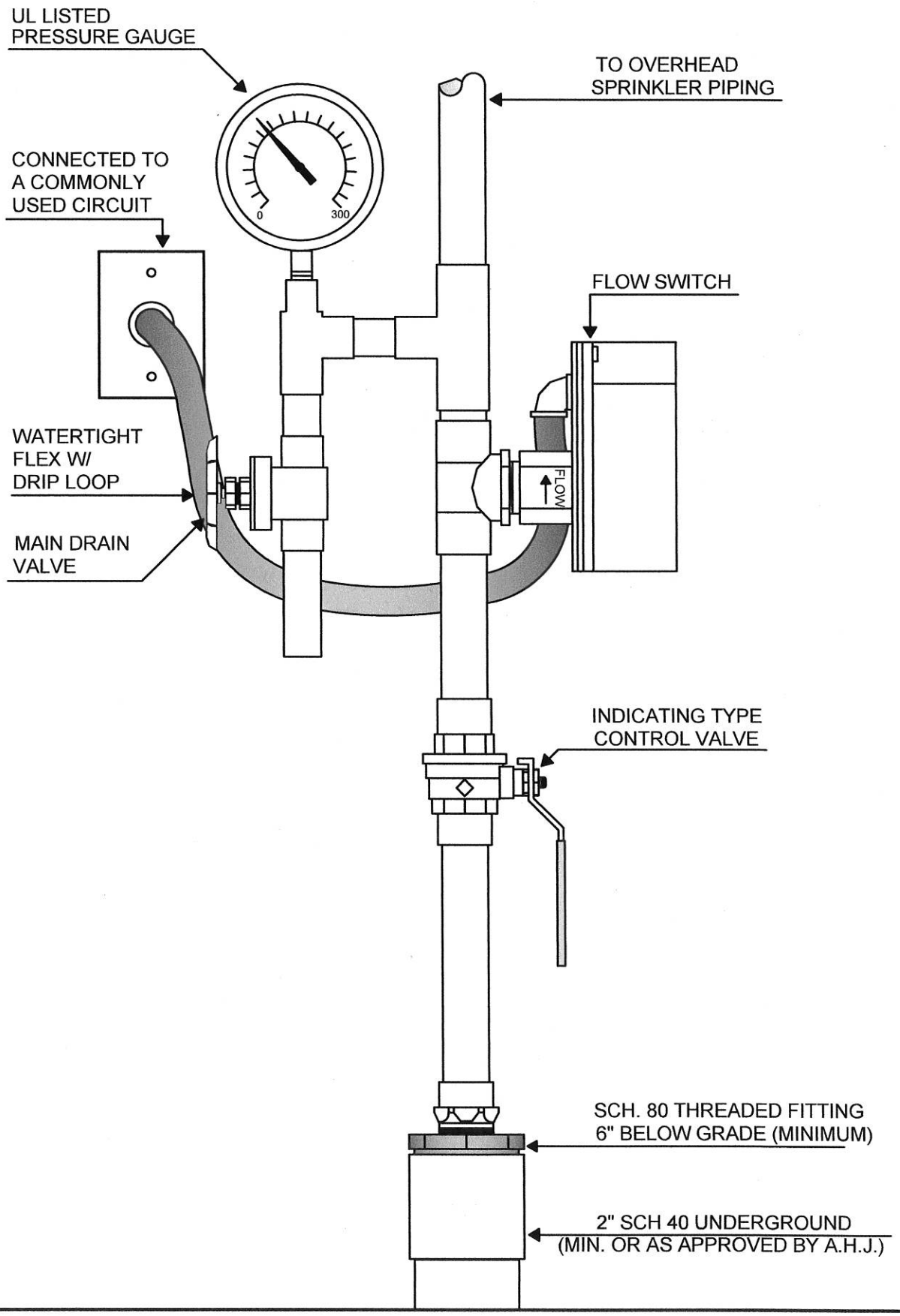
UNDERGROUND FIRE SERVICE NOTES

1. Underground fire service line to have a minimum of 18" of cover. Schedule 40 pipe and fittings are acceptable, but threaded fittings shall be schedule 80.
2. Pipe shall transition from plastic to metallic a minimum of 6" below grade.
3. All residential sprinkler system underground piping systems shall be tested at not less than minimum design working pressure for 15 minutes.
4. Underground pipe shall be flushed with water at the minimum design pressure until the water runs clear insuring the line is free from contamination before the underground pipe is connected to the riser.



ATTACHMENT 'B'

SPRINKLER RISER WITHOUT DOMESTIC HOOK-UP
(MUNICIPAL WATER SOURCE)



ATTACHMENT 'B-1'

SPRINKLER RISER WITH DOMESTIC HOOK-UP
(NON-MUNICIPAL WATER SOURCE)