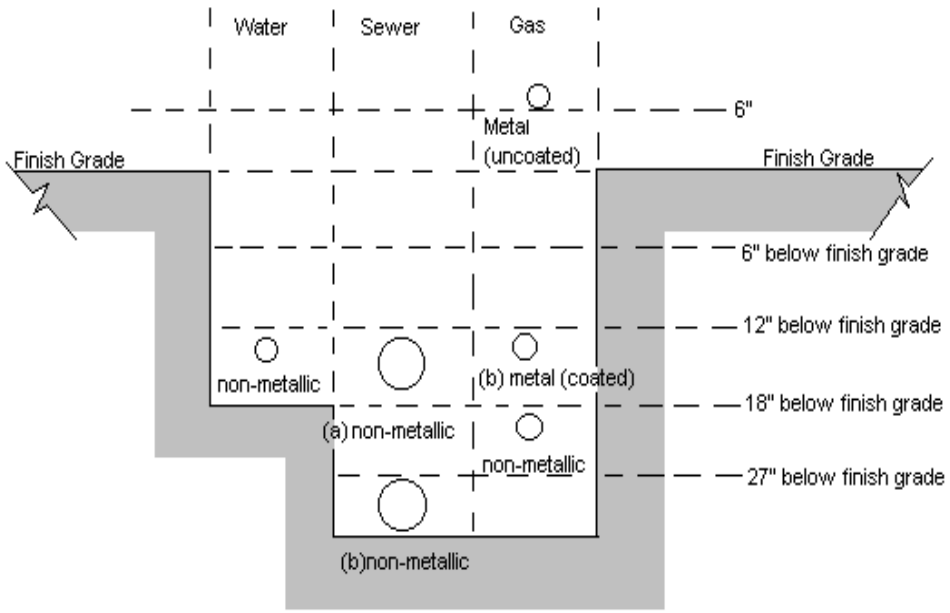
BURIAL DEPTHS
For Yard Piping
B-12

Development Services
Building Division
1635 Faraday Avenue
760-602-2719
www.carlsbadca.gov

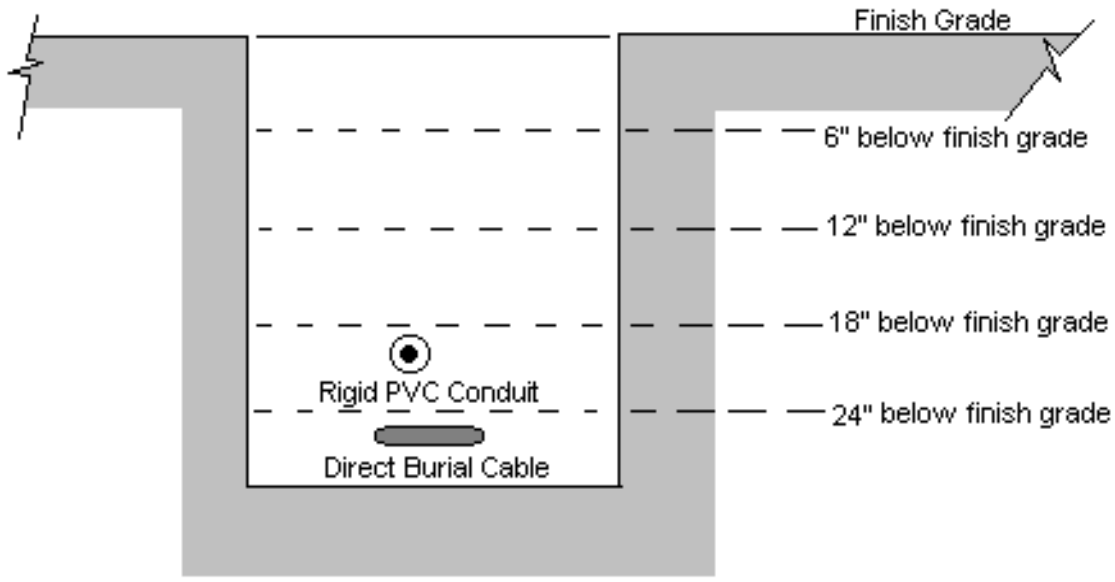
These burial depths apply outside of buildings within private property subject to the following provisions:

- These are not applicable to public utility piping.
- Pipes may be laid in the same trench without horizontal separation except as noted for water and sewer lines.
- These depths are not applicable in mobilehome parks.



WATER Piping	DRAIN - Waste Piping	FUEL GAS Piping
Metallic piping shall be a minimum of 12” below finish grade.	Metallic piping shall be a minimum of 12” below finish grade.	Metallic piping must be 6” minimum above finish grade or factory wrapped w/ protective coating
Non - Metallic piping shall be a minimum of 12” below finish grade	(a) 12” minimum below finish grade (b) For pipe not listed to be used inside buildings, the sewer must be 12” below the water piping. The water pipe shall be to one side on a solid shelf - total depth to the top of the sewer 27”	Non-metallic gas piping must be 18” minimum below finish grade. **Note:** riser to be metallic. Horizontal metallic portion of the riser shall extend 30” minimum before connecting to the plastic piping. Use of a factory transition fitting is required. All metal fittings must be primed and wrapped with minimum of 40 mils of approved pipe wrap tape. Number 14 awg copper tracer wire shall be attached to non-metallic piping and shall terminate above grade at both ends. Pipe depths may be reduced by 6” when a minimum of 4” of concrete is placed over the trench.

Burial Depths for ELECTRICAL Lines on Private Property	
Rigid Non-metallic Conduit	18” Minimum 24” Under areas subject to vehicular traffic
Direct Burial Cable	24 “ Minimum **Note:** A reduction to 12” deep is allowed for any wiring method for a 120 V, 20 Ampere or less rated circuit that is GFCI protected
Metallic Conduit	Not recommended except per San Diego ICBO Newsletter 345-346-348
Note: These depths may be reduced 6 “ when minimum of 2” of concrete cover is placed in the conduit trench	



The above burial depths are not applicable for the following uses:

- Mobilehome Parks
- SDG&E Service Laterals
- Exterior concrete slabs or Underneath building slabs a minimum of 3 ½ “ thick. (conduit may be installed directly underneath slabs)
- Locations where solid rock is encountered. Check with field inspector for possible solutions
- Vehicular traffic areas

Any trenching near or through septic systems must be reviewed by the County Health Department as well as the Building Division.

1209.7.7 Identification. Line pressure regulators at multiple regulator installations shall be marked by a metal tag or other permanent means designating the building or the part of the building being supplied. [NFPA 54:5.8.7]

1209.8 Back-Pressure Protection.

1209.8.1 Where to Install. Protective devices shall be installed as close to the utilization appliance as practical, where the design of utilization appliances connected are such that air, oxygen, or standby gases could be forced into the gas supply system. [NFPA 54:5.10.1.1] Gas and air combustion mixers incorporating double diaphragm "zero" or "atmosphere" governors or regulators shall require no further protection unless connected directly to compressed air or oxygen at pressures of five (5) psi (34 kPa) or more. [NFPA 54:5.10.1.2]

1209.8.2 Protective Devices. Protective devices shall include but not be limited to the following:

(1) Check valves

(2) Three-way valves (of the type that completely closes one side before starting to open the other side)

(3) Reverse flow indicators controlling positive shutoff valves

(4) Normally closed air-actuated positive shutoff pressure regulators [NFPA 54:5.10.2]

1209.9 Low-Pressure Protection. A protective device shall be installed between the meter and the gas utilization appliance if the operation of the appliance (i.e., gas compressors) is such that it could produce a vacuum or a dangerous reduction in gas pressure at the meter. Such devices include, but are not limited to, mechanical, diaphragm-operated, or electrically operated low-pressure shutoff valves. [NFPA 54:5.11]

1209.10 Shutoff Valves. Shutoff valves shall be approved and shall be selected giving consideration to pressure drop, service involved, emergency use, and reliability of operation. Shutoff valves of size one (1) inch (25 mm) National Pipe Thread and smaller shall be listed. [NFPA 54:5.12]

1209.11 Expansion and Flexibility.

1209.11.1 Design. Piping systems shall be designed to have sufficient flexibility to prevent thermal expansion or contraction from causing excessive stresses in the piping material, excessive bending or loads at joints, or undesirable forces or moments at points of connections to equipment and at anchorage or guide points. Formal calculations or model tests shall be required only where reasonable doubt exists as to the adequate flexibility of the system. [NFPA 54:5.13.1]

Flexibility shall be provided by the use of bends, loops, offsets, or couplings of the slip type. Provision shall be made to absorb thermal changes by the use of expansion joints of the bellows type, or by the use of "ball" or "swivel" joints. Expansion joints of the slip type shall not be used inside buildings or for thermal expansion. Where expansion joints are used, anchors or ties of sufficient strength and rigidity shall be installed to provide for end forces due to fluid pressure and other causes. [NFPA 54:5.13.1.1]

Pipe alignment guides shall be used with expansion joints according to the recommended practice of the joint manufacturer. [NFPA 54:5.13.1.2]

1209.11.2 Special Local Conditions. Where local conditions include earthquake, tornado, unstable ground, or flood hazards, special consideration shall be given to increased strength and flexibility of piping supports and connections. [NFPA 54:5.13.2]

1210.0 Excess Flow Valve.

Where automatic excess flow gas valves are installed, they shall be listed, sized, and installed in accordance with the manufacturer's instructions. [NFPA 54-09:5.13]

1211.0 Gas Piping Installation.

1211.1 Piping Underground.

1211.1.1 Clearances. Underground gas piping shall be installed with sufficient clearance from any other underground structure to avoid contact therewith, to allow maintenance, and to protect against damage from proximity to other structures. In addition, underground plastic piping shall be installed with sufficient clearance or shall be insulated from any source of heat so as to prevent the heat from impairing the serviceability of the pipe. [NFPA 54:7.1.1]

1211.1.2 Protection Against Damage.

(A) Cover Requirements. Underground piping systems shall be installed with a minimum of eighteen (18) inches (460 mm) of cover. Where external damage to the pipe is not likely to result, the cover shall be a minimum of twelve (12) inches (300 mm). Where a minimum of twelve (12) inches (300 mm) of cover cannot be provided, the pipe shall be installed in conduit or bridged (shielded). [NFPA 54:7.1.2.1]

(B) Trenches. The trench shall be graded so that the pipe has a firm, substantially continuous bearing on the bottom of the trench. [NFPA 54:7.1.2.2]

(C) Backfilling. Where flooding of the trench is done to consolidate the backfill, care shall be exercised to see that the pipe is not floated from its firm bearing on the trench bottom. [NFPA 54:7.1.2.3]

1211.1.3 Protection Against Corrosion. Gas piping in contact with earth or other material that could corrode the piping shall be protected against corrosion in an approved manner. When dissimilar metals are joined underground, an insulating coupling or fitting shall be used. Piping shall not be laid in contact with cinders. Uncoated threaded or socket-welded joints shall not be used in piping in contact with soil or where internal or external crevice corrosion is known to occur. [NFPA 54:7.1.3]