

**HUMBOLDT COUNTY BUILDING DEPARTMENT  
CITY OF WINNEMUCCA BUILDING DEPARTMENT  
ELECTRICAL LINES, WATER LINES, SEWER LINES, FUEL GAS PIPING & HEAT DUCTS  
BURIAL & SUPPORT REQUIREMENTS**

**ELECTRICAL LINES BURIAL REQUIREMENTS – 2011 National Electric Code (NEC)**

- ❖ Direct burial cables shall be buried a total of twenty-four (24) inches
  - ❖ Rigid metal conduit shall be buried a total of six (6) inches
  - ❖ Intermediate metal conduit shall be buried a total of six (6) inches
  - ❖ Rigid nonmetallic conduit (PVC) approved for direct burial shall be buried a total of eighteen (18) inches
  - ❖ Grounding electrode conductor wire shall be installed in metal conduit or sunlight resistant nonmetallic conduit
  - ❖ Electrical wires that are buried are required to be direct burial wire even when conduit is utilized or approved for wet location.
  - ❖ Electrical lines can be placed in the same trench as the water line with the electrical line placed above the water line with a twelve (12) inch earth separation
  - ❖ Electrical lines shall not pass through the footing of a building or structure
  - ❖ A warning tape/ribbon shall be installed in the trench where direct burial wire is installed. Twelve inches above the underground installation. NEC 300.5(D)(3).
- Pipes shall be properly bedded with sand. Backfill containing rocks or aggregate should not be used to backfill any piping

**ELECTRICAL CONDUIT SUPPORT REQUIREMENTS – 2011 NEC**

CONDUIT TYPE	CONDUIT SIZE	MAX. DIST BTWN SUPPORTS	FASTENING SUPPORT DISTANCE FROM OUTLET BOX, JUNCTION BOX, CABINET, OR FITTING
Intermediate Metal (IMC) NEC Section 342-30 (A)(B) & Table 344.30 (B)(2)	½" to ¾" 1" 1 ¼" to 1 ½" 2" to 2 ½" 3" & Larger	10 feet 12 feet 14 feet 16 feet 20 feet	3 feet – Can be increased to 5 feet where structural members do not readily permit fastenings within 3 feet
Rigid Metal (RMC) NEC Table 344.30(B)(2)	½" to ¾" 1" 1 ¼" to 1 ½" 2" to 2 ½" 3" & Larger	10 feet 12 feet 14 feet 16 feet 20 feet	3 feet – Can be increased to 5 feet where structural members do not readily permit fastenings within 3 feet
Rigid Nonmetallic (RNC) (PVC) NEC Section 352.30 & Table 352.30(B)	½" to 1" 1 ¼" to 2" 2 ½" to 3" 3 ½" to 5" 6"	3 feet 5 feet 6 feet 7 feet 8 feet	All sized 3 feet
Electrical Metallic Tubing (EMT) NEC Section 358	All sizes	10 feet	3 feet
Flexible Metal Conduit (FMC) Section 348.30 (A)(B)	All sizes	4 ½ feet	12 " – see exception on lengths less than 3 feet where flexibility is necessary
Liquidtight Flexible Metal (FMC) Section 350.30	All sizes	4 ½ feet	12 " – see exception on lengths less than 3 feet where flexibility is necessary
Liquidtight Flexible Nonmetallic (LFNC) NEC Section 356.30(1)(2)	All sizes	3 feet – Max. length of 6 feet	12 inches

CONDUIT TYPE	CONDUIT SIZE	MAX. DIST BTWN SUPPORTS	FASTENING SUPPORT DISTANCE FROM OUTLET BOX, JUNCTION BOX, CABINET, OR FITTING
Nonmetallic Sheathed Cable (Romex) NEC Section 334.30(A)		Where permitted by NEC – shall be secured by staples, straps, or similar fittings so designed and installed as not to damage the cable. Secure at intervals not exceeding 4 ½ feet. Cables run through holes in wood or metal joists, rafters or studs shall be considered to be supported & secured. The cable shall closely follow the surface of the building finish or of running boards.	12 inches
Electric Nonmetallic Tubing NEC Section 362.30(A)(B)	All sizes	3 feet	3 feet
Liquidtight Flexible Metal Conduit (LFMC) NEC Section 350.30(A)(B)	All sizes	4 ½ feet	12 inches
Metal Clad Cable (MC) NEC Section 330.30 (A) (B)	All sizes	6 feet – Horizontal Run See exception for unsupported cables.	12 inches

**WATER LINE BURIAL REQUIREMENTS – 2012 Uniform Plumbing Code**

- ❖ All water service yard piping shall be at least twelve (12) inches below the average local frost depth. The frost depth in Humboldt County is twenty-four (24) inches, therefore water lines shall be buried at a depth of thirty-six (36) inches.
- ❖ The water line shall be approved for potable water use. Copper, PEX, or CPVC water line may be used within a building or structure. PVC water line may be used up to the building or structure foundation and transition to approved pipe. (Note: PEX water line may be used within a building or structure. PEX-AL-PEX may be used within a building or structure. PE-AL-PE shall be used inside a building or structure for cold water line only.
- ❖ Water piping shall not be ran or laid in the same trench as the sewer line unless all requirements of 2012 UPC Section 720.0 are met.
- ❖ Water piping can be ran in the same trench as the electrical line with the water piping below the electrical lines with a twelve (12) inch earth separation.
- ❖ Water line crossing sewer shall have a minimum of 12" earth separation and the water line shall be sleeved with a 10 foot pipe installed with 5 feet on each side of the crossover.
- ❖ Pipes shall be properly bedded with sand. Backfill containing rocks or aggregate should not be used to backfill any piping.

**WATER LINE SUPPORT REQUIREMENTS (2012 UPC TABLE 313.1)**

TYPE OF PIPING	PIPE SIZE	MAX. DISTANCE BETWEEN SUPPORTS	
		HORIZONTAL	VERTICAL
Copper tube & pipe	½" to 1 ½" 2" & larger	6 feet 10 feet	Each floor – not to exceed 10'
CPVC	½" to 1" 1 ¼" & larger	3 feet 4 feet	Base & each floor. Provide midstory guides
PEX	All sizes	32"	Base & each floor. Provide midstory guides
PEX-AL-PEX	All sizes	98"	Base & each floor. Provide midstory guides
PE-AL-PE	All sizes – Only permitted for cold water inside the foundation wall of any building	98"	Base & each floor. Provide midstory guides
PVC	No permitted inside the foundation wall of any building.		

**SEWER LINES BURIAL REQUIREMENTS – 2012 Uniform Plumbing Code**

- ❖ Building sewer lines shall run in practical alignment and at a uniform slope of not less than one-fourth (1/4) of an inch per foot toward the point of disposal. Building sewer piping shall be laid on a firm bed throughout its entire length.
- ❖ Cleanouts shall be placed inside the building near the connection between the building drain and the building sewer or installed outside the building at the lower end of the building drain and extend to grade. Cleanouts shall also be placed at intervals not to exceed one hundred (100) feet.
- ❖ Building sewer lines **shall not** be placed in the same trench as electrical and water lines.
- ❖ Changes in direction of drainage pipes shall be made with approved fittings - 45° wye fitting. Recommend using long sweep 45°. UPC Section 706.
- ❖ Pipes shall be properly bedded with sand. Backfill containing rocks or aggregate should not be used to backfill any piping.

**SEWER LINE SUPPORT REQUIREMENTS (2012 UPC Table 313.1)**

TYPE OF PIPE	MAX. DISTANCE BETWEEN SUPPORTS - HORIZONTAL	MAX. DISTANCE BETWEEN SUPPORTS - VERTICAL
Cast	Type of Joint (lead & Oakum) – 5 feet except maybe 10 feet where 10 feet lengths are installed. Must support at each horizontal branch connection.	Base & each floor not to exceed 15 feet.
Cast	Type of Joint ( Compression Gasket) – Every other joint unless over 4 feet then supported within 18' of each joint. Support at each horizontal branch connection.	Base & each floor not to exceed 15'.
ABS DWV	4 feet and at end of branches or changes in directions	Base and each floor. Provide midstory guides. Provide for expansion every 30'

**FUEL GAS PIPING BURIAL REQUIREMENTS – 2012 Uniform Plumbing Code**

- ❖ No gas piping shall be installed in or on the ground under any building or structure and all exposed gas piping shall be kept at least six (6) inches above grade and structures.
- ❖ All horizontal metallic piping shall have at least twelve (12) inches of earth cover. Plastic gas piping shall have at least eighteen (18) inches of earth cover.
- ❖ All service lines shall be laid on clean compacted soil and shall be covered with a layer of sand before backfilling. All rocks or any substances which would puncture lines shall be removed.
- ❖ Plastic pipe shall have a tracer wire (Min. AWG 14) shall be buried (corrosion resistant) with plastic pipe for locating purposes. One end shall be brought above ground at a building wall or riser. 2003 Uniform Mechanical Code, Section 1311.1.7(c)
- ❖ Pipes shall be properly bedded with sand. Backfill containing rocks or aggregate should not be used to backfill any piping.

**FUEL GAS PIPING SUPPORT REQUIREMENTS (2012 UPC Tables 313.1 & 1210.2.4.1))**

TYPE OF PIPE	SIZE OF GAS PIPING	MAX. DISTANCE BETWEEN SUPPORTS	
		HORIZONTAL	VERTICAL
Steel, brass, & tinned copper	1/2"	6 feet	Every floor level
	3/4" or 1"	8 feet	
	1 1/4" or Larger	10 feet	
Tubing – Smooth Wall	1/2"	4 feet	Every floor level
	5/8" or 3/4"	6 feet	
	7/8" or 1"	8 feet	

**HEATING DUCT SUPPORT REQUIREMENTS**

- ❖ Heating duct supports – following manufacturer's instructions
- ❖ Flexible duct (Residential Only) – Maximum spacing between supports four (4) feet. Allowed to have 1/2" per foot of sag.