CITY OF MILPITAS
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WATER PIPING (RESIDENTIAL)

1. PERMIT INFORMATION

- ❑ The installation or replacement of a water piping within a building requires a plumbing permit [CPC 502.1].
  - Plumbing faucets and valves may be replaced in the same location as part of the water piping permit.
  - Extensive removal of the walls or ceiling structure requires a building permit.
  - For piping between the meter and building, see the residential *Water Service* handout.

- ❑ A Building Permit may be issued only to the Building Owner or their Authorized Agent [CRC 105.1].
  - See also *Authorized Agent Sample Letter*.
  - Where the Contractor is acting as the Owner's Authorized Agent, they must be a State of California Licensed Contractor with the proper license classification.

- ❑ If the work is performed by the Building Owner personally or by his/her workers and an inspection indicates the work cannot be completed satisfactorily, then a licensed contractor must perform the work.

- ❑ If the Building Owner hires workers, State Law requires the Building Owner to obtain Worker's Compensation Insurance. Proof of this insurance is required prior to inspection.

2. INSTALLATION REQUIREMENTS

- ❑ **Codes.** All work must comply with the *California Residential Code* (CRC), *California Plumbing Code* (CPC), *California Electrical Code* (CEC), the *Milpitas Municipal Code* (MMC), and other adopted codes as applicable.
  - This document contains informational references to various California codes and the Milpitas Municipal Code, based on the 2022 and 2023 editions of those documents, respectively. For additional, or more specific, information and exceptions, please refer to the codes and standards specific to your project.

- ❑ **Materials.** Pipe, tube, fittings, solvent cement, thread sealants, solders, and flux used in potable water systems intended to supply drinking water shall comply with NSF 61. Materials used, except valves and similar devices, shall be of a like material except where otherwise approved by the Building Official. Materials for water piping shall comply with the standards listed in CPC Table 604.1. [CPC 604.1]
  - **Listing.** Pipe, pipe fittings, traps, fixtures, material, and devices used in a plumbing system shall be listed by an approved listing agency, and permanently marked in accordance with its listing. [CPC 301.2, 301.2.1]
  - **Lead Content.** The maximum allowable lead content in pipes, pipe fittings, and fixtures shall be not more than a weighted average of 0.25%, while for solder and flux the content shall be limited to no more than 0.2%. [CPC 604.2]
  - **Dielectric Unions.** Dielectric unions shall be used at all points of connection where there is a dissimilarity of metals [CPC 605.15].

- ❑ **Steel Nail Plates.** Plastic and copper or copper alloy piping penetrating framing members to within 1 inch of the exposed framing shall be protected by steel nail plates not less than No. 18 gauge in thickness. The steel nail plate shall extend along the framing member not less than 1 ½ inches beyond the outside diameter of the pipe or tubing. [CPC 312.9]

- **Drilling and Notching.**
  - **Wall Studs.**
    - **Cuts or Notches.** A stud in an exterior wall or bearing partition shall not have any cuts or notches exceeding 25% of its depth. In nonbearing partitions, this limit is increased to 40%. [CRC R602.6]
    - **Holes.** Bored holes in studs are limited in diameter to 60% of the stud depth, may not be within 5/8 inch of the edge of the stud, and may not be located in the same section as a cut or notch. For studs in exterior walls or bearing partitions, where a hole exceeds 40% of the stud depth, the stud shall be doubled and not more than two successive doubled studs shall be so bored. Approved stud shoes are to be installed in accordance with the manufacturer's instructions. [CRC R602.6]

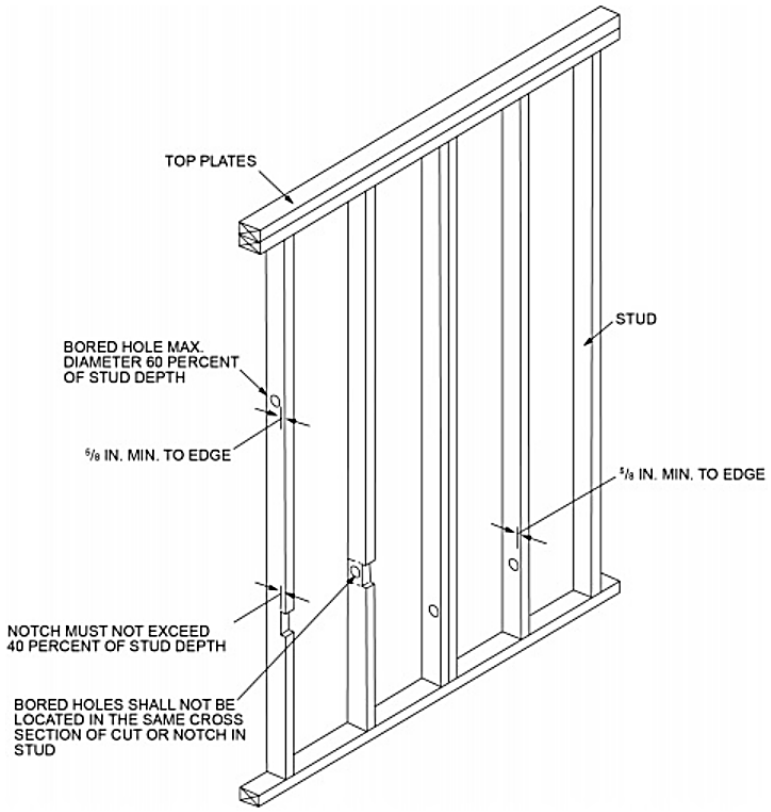

Figure 1- Exterior Walls and Bearing Partitions

  - **Top Plate.**
    - Where the top plate is cut, drilled, or notched through more than 50% of its width to allow the placement of piping, a 16 ga galvanized metal tie, 1 ½ inches wide, shall be fastened across the plate at each side of the opening with not less than eight 10d nails having a length of 1 ½ inches at each side or equivalent. The metal tie must extend not less than 6 inches past the opening. [CRC R602.6.1]

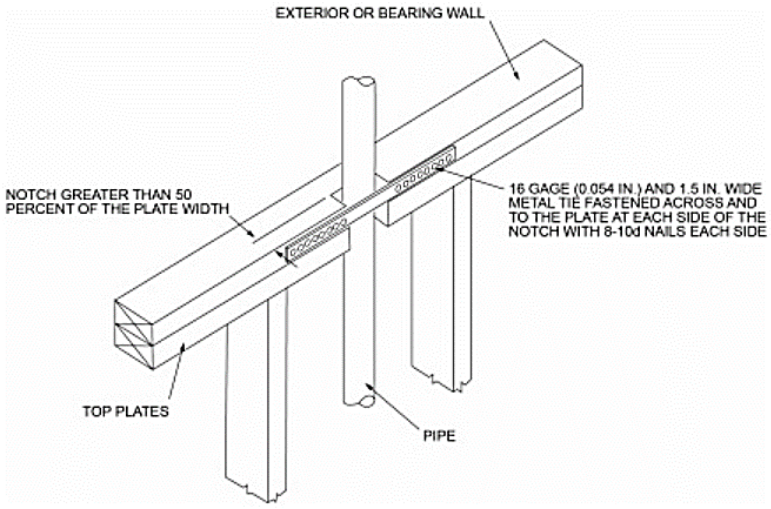

Figure 2 - Strap at Top Plate

  - **Joists, Rafters, and Beams.**
    - **Notches.** Notches shall not exceed 1/6 the depth of the member, may not be longer than 1/3 the depth, and may not be located in the middle 1/3 of the span. At the ends of members, notches are limited to 1/4 the depth of the member. The tension side of members 4 inches in thickness or greater may shall not be notched except at the ends of members. [CRC R502.8.1]
    - **Holes.** Holes shall not exceed 1/3 the depth of the member and cannot be within 2 inches of the top or bottom of the member, or any other hole or notch. [R502.8.1]
    - **Engineered Wood Products.** Cuts, notches, and holes are prohibited in trusses, structural composite lumber (SCL), structural glue-laminated members, cross-laminated timber (CLT), or I-joists except where permitted by the manufacturer's recommendations or where specifically considered in the design of a registered design professional [CRC R502.8.2].
  - **Repair of Structural Members.** A structural member weakened or impaired by cutting, notching, or otherwise shall be reinforced, repaired, or replaced so as to be left in a safe structural condition [CPC 312.11].

- ❑ **Support.** Water piping shall be adequately supported in accordance with CPC Table 313.3 [CPC 609.1].

EXCERPT – *California Plumbing Code* Table 313.3 – Hangers and Supports[1]		
Materials	**Horizontal**	**Vertical**
Copper & Copper Alloys	1 ½ inches and smaller, 6 feet 2 inches and larger, 10 feet	Each floor, not to exceed 10 feet[2]
PEX	1 inch and smaller, 32 inches 1 ¼ inches and larger, 4 feet	Base and each floor, provide mid-story guides
[1] – For two common materials seen in residential water piping. For other materials, refer to the CPC.		
[2] – Support at each horizontal branch connection.		

- ❑ **Insulation.**
  - **Hot Water Piping.** Shall be insulated [CPC 609.12.1]
  - **Thickness.** Insulation wall thickness shall be at least the diameter of the pipe but need not exceed 2 inches [CPC 609.12.2].

- ❑ **Testing.** Upon completion of a section or of the entire hot and cold water supply system, the system shall be tested with water or air [CPC 609.4].
  - **Pressure.** The potable water test pressure shall be at least equal to the working pressure under which the system is to be used. The air pressure shall be a minimum of 50 psi. Plastic pipe shall not be tested with air.
  - **Duration.** The piping system shall withstand the test pressure without showing evidence of leakage for a period of not less than 15 minutes.
  - **Test Gauge.** Gauge shall have incrementation not exceeding 1 psi, and a pressure range not exceeding twice the pressure applied [CPC 318.3, 318.5].

- ❑ **Rodentproofing.** Where openings have been made in walls, floors, or ceilings for the passage of pipes, such openings shall be closed and protected by the installation of approved metal collars securely fastened to the adjoining structure [CPC 312.12.2].

- ❑ **Backflow Prevention.** Where the connection of the water piping provides a possibility of polluting a domestic water supply or cross-connection with contaminated water a backflow prevention device must be provided which has been approved for the potential hazard [CPC 602.3].
  - **Lawn Sprinklers and Irrigation Systems.** Potable water supplies to lawn sprinklers and irrigation systems shall be protected from backflow by one of the means described in CPC 603.5.6.
  - **Hose Attachments.** Potable water outlets with hose attachments shall be protected by a nonremovable hose bibb-type backflow preventer, a nonremovable hose bibb-type vacuum breaker, or by an atmospheric vacuum breaker installed not less than 6 inches above the highest point of usage located on the discharge side of the last valve [CPC 603.5.7].
  - **Swimming Pools, Spas, and Hot Tubs.** Potable water supply to swimming pools, spas, and hot tubs shall be protected by an air gap or a reduced pressure principle backflow preventer where the unit is equipped with a submerged fill line or the water supply is directly connected to the unit circulation system [CPC 603.5.20].

- ❑ **Grounding and Bonding.** Metal water piping systems shall be bonded to one of the following: (1) service equipment enclosure, (2) grounded conductor at the service, (3) grounding electrode conductor, if of sufficient size, or (4) one or more grounding electrodes, if the grounding electrode conductor or bonding jumper to the grounding electrode is of sufficient size [CEC 250.104(A)].
  - **Plastic Materials.** Where metal building supply piping is used for electrical grounding purposes, replacement piping, therefore, shall be of like materials except where a grounding system acceptable to the Building Official is installed, inspected, and approved, the metallic pipe shall be permitted to be replaced with nonmetallic pipe. [CPC 604.10]

- ❑ **Disinfection of Potable Water System.** New potable water systems shall be disinfected prior to use in accordance with CPC 609.10. See also Policy BDP-PL05.

3. ADDITIONAL REQUIREMENTS

- ❑ **Smoke/Carbon Monoxide Alarms and Spark Arrestor Inspection.** In all one- and two-family residences, installation and inspection of required smoke alarms, carbon monoxide alarms, and spark arresters must be completed prior to the final inspection. Refer to the *Smoke Alarm, Carbon Monoxide Alarm, and Spark Arrester Certificate* handout for detailed information.

- ❑ **Water Conserving Fixture Inspection.** All one- and two- family residences must have replaced all non-compliant plumbing fixtures with water-conserving plumbing fixtures and verification of this is required as a condition of final approval of any permit [CA Civ Code § 1101]. Refer to the *Water Conserving Certificate of Compliance* handout for details and exceptions.

4. INSPECTIONS

- ❑ Typically, two inspections are required of water pipe installations.
  - **Rough Plumbing.** An inspection is required after the installation of the water piping and related plumbing materials, prior to the installation of wall or ceiling membranes [CPC 105.2(2)].
    - **Pressure Testing.** Testing of the water piping is typically conducted at this time [CPC 105.3, 609.4]
  - **Final.** A final inspection is conducted after all work has been completed [CPC 105.2(3)].
    - **Additional Requirements.** Inspection of smoke alarms, carbon monoxide detectors, and water conserving fixtures may be performed during the final inspection, or certificates stating compliance may be provided to the inspector (see *Additional Requirements* above).

5. QUESTIONS

- ❑ If you have any questions regarding your project, contact the Office of Building Safety at (408) 586-3240.