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<th>UNDERSLAB AND SLAB PLUMBING</th>
<th>Revision Date: 02/11/11</th>
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<tr>
<td>City of Palo Alto (CPA)</td>
<td>General Requirements/Checklist for:</td>
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<td>Building Inspection</td>
<td>Residential and Commercial</td>
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<td>285 Hamilton Ave.</td>
<td>Codes Enforced:</td>
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<td>Inspection Request: 650 329-2496</td>
<td>2011 CPC, CBC, CRC</td>
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<td>IVR # 203</td>
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The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.

**WARNING**
- Failure to complete items below prior to inspection may result in a re-inspection fee.

**UNDERSLAB/ UNDER STRUCTURE GAS PIPE**
- Gas piping is prohibited underslab/structure unless sleeved and vented. See “Under Structure Gas Pipe” guidelines for CPA approved method.

- **GRADE OF HORIZONTAL DRAINAGE PIPING**
  - Drainage piping shall maintain a minimum ¼” inch per foot uniform slope. *CPC 708.0*
  - **Exception:** At the discretion of the building official and when impractical, due to the depth of the street sewer or to the structural features or to the arrangement of any building or structure, pipes 4” or larger may have a slope no less than 1/8” per foot.

- **UNDERSLAB PLUMBING**
  - Piping shall be inspected prior to backfilling trench.
  - Piping shall be laid on a firm bed throughout its entire length. *CPC 718.2 & 718.3*
  - Trenches shall be backfilled and compacted in thin layers to 12” inches above the top of the piping with clean earth or sand which shall not contain stones, boulders, construction debris or materials that would break or damage piping or cause corrosive action. *CPC 315.4*

- **SLAB PLUMBING: (WATER, AND WASTE WATER)**
  - See “Sewer Replacement” guidelines for all sewer line and clean out requirements.
  - **Testing piping system:** Drain, waste, and vent (DWV) system shall be tested with no less than 10’ of head water above the system for 15 minutes or 5 psi air test for 15 minuets. All plumbing systems are required to be exposed for inspection. *CPC 712.2*
  - **Testing of water piping systems** shall consist of working pressure under which system is to be used or a sixty (50) psi air pressure test for 30 minutes *CPC 609.4*
  - Type L copper tubing shall be installed without joints if possible. Where joints are permitted, **they shall be brazed and fittings shall be wrought copper.** Type M copper is prohibited. (609.3.2)
Clean-outs

- Cleanout shall be approved type WYE, combo fittings or approved two way cleanout such as head to head double combos.
- Verify building clean-out is within 2’ feet of the building terminating at grade level. CPC 718.3
- Additional clean-outs are required at property lines, end of line, horizontal change of direction exceeding 135 degrees, and runs exceeding 100’ in length. CPC 707.0 and 719.0
- Clean-out shall be installed so that it opens to allow cleaning in the direction of flow. CPC 719.4
- Unions are not allowed in slab water piping systems. CPC 609.3
- All piping systems shall be adequately supported. CPC table 3-2
- Water piping systems shall not be installed in interior or perimeter footings
- All sizing shall meet CPC requirements. CPC 601.0, 701.0
- Water piping may be installed within or under the slab provided approved wrapping and protection are used. See approved wrapping below CPC 609.3
- Bracing methods such as steel/rebar and wire are not allowed to have direct contact with ABS, plastic and copper piping. Use approved staking devices or apply foam wrap prior to use of steel stakes.
- Verify that **trap seal primer** is installed at floor drain(s). trap seal primer shall be accessible for maintenance. CPC 1007.0
- Maintain ¾” min. concrete coverage over plumbing pipes and pipe wrap in foundation.
- **Foundation Wall Sleeves** shall be provided to protect all piping through concrete and masonry footings/walls. Schedule 40 with a min. ½” clearance between sleeve and pipe. Fill void at end of sleeve with caulking OR install 1” snap-on pipe insulation i.e. Imco lock or Armaflex. CPC 313.10.1, 2, 3
- Concrete slab/footing shall not bear directly on plumbing lines. Concrete shall extend 6” minimum below plumbing pipes. See [FIGURE A-1]

**FIGURE A-1**

![Diagram](image)

- No piping shall be directly embedded in concrete. All piping shall be protected against direct contact with concrete. Piping shall be wrapped with snap-on insulation such as **imco-lock or armaflex** a minimum of 1” thick, or properly sleeved. CPC 313.2 See [FIGURE A-2]
1” inch thick snap-on insulation shall be installed with seam at bottom of pipe. **Do not install insulation at fittings prior to inspection.**

**Note:** Use of snap on insulation allows for ready access and inspection of pipe with insulation in place, eliminating the need for additional inspections. See Vendors and Services for local suppliers.

**FIGURE A-2**

![Diagram](image)

**Tailpiece:** *CPC 1001.4*

- The vertical distance between a fixture outlet and the trap weir shall be as short as practicable, and not more than 24” in length.

**CONDUITS AND PIPES EMBEDDED IN CONCRETE**

- Conduits, pipes and sleeves of any materials not harmful to concrete and within the limitations of **ACI 318, Sec. 6.3** are permitted to be embedded in concrete WITH THE APPROVAL OF THE REGISTERED DESIGN PROFESSIONAL **CBC 1906.3**

- **ACI 318, Sec. 6.3.5.1:** Pipes shall not be larger than 1/3 the overall thickness of slab, wall, or beam in which they are embedded. Example: 8” stem wall = max. 2-3/4” pipe, 12” slab = max. 4” pipe.

- **ACI 318, Sec. 6.3.5.2:** Pipes shall not be spaced closer than 3 diameters or widths on center. Example: (2) 2” pipes shall be spaced no closer than 6” from center to center of pipe.

- **ACI 318, Sec. 6.3.12:** Piping and conduit shall be so fabricated and installed that cutting, bending, or displacement of reinforcement from its proper location will not be required.

- Piping in shear walls and piping that is not in compliance with **ACI 318, Sec. 6.3** shall be shown on plans OR letter of approval by the engineer of record.
Pipe in stem wall shall have a min. ¾” clearance to form for proper consolidation of concrete around pipe, recommend 2” if possible.

**PLASTIC PIPE IN FOUNDATION**

- Stem wall/curb of a fire rated separation/attached garage side AND at exterior locations shall be protected by intumescent barrier and perforated angle iron. Exterior locations do not require intumescent barrier. Angle iron shall be attached to forms prior to inspection.
  
Exception: Install cast iron pipe. [FIGURE A-4, A-5]

**FIGURE A-4**

![Diagram of plastic pipe in foundation showing intumescent fire barrier, forms, and angle iron.]