Todays Agenda

10:15 am - 12:15

• Underground Plumbing
• Rough Plumbing
• Final Plumbing
As inspectors, what are we looking for?

- Mechanical Plan Check
- Methane Zone
- Clean outs
- Approved Materials / Test
- Up Stream Man Hole Elevations
- De Watering System
- Floor Drains & Floor Sinks
- Trough Drains
- Trap Primers
- Back Water Valves
- Industrial Waste Plans
- Health Department Plans
Building permit and building card on the job site (if required)

What Type of Building is it? ADU?

What is the Work Description?

Is it a Change of Use?

Tenant Improvement?
Building Sewer and Building Drain Materials

- Cast Iron
- Galvanized steel (6” above grade)
- Copper DWV
- ABS/PVC DWV (Schedule 40)
  (Note: HCD 2 story areas of residential accommodation, but allowed for non-residential)

Continue>
• Extra strength clay underground only (existing building sewer under a new addition should be replaced)

• Stainless Steel 304 (6” above grade) (701.2 & Table 701.2)

• Building sewer material of lesser quality. Building sewer material 2’ away & 1’ cover (715)
## Approved Materials for Building Waste, Vents and Sewer Systems

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>UNDERGROUND DRAIN WASTE, VENT PIPE AND FITTINGS</th>
<th>ABOVE-GROUND DRAIN WASTE, VENT PIPE AND FITTINGS</th>
<th>BUILDING SEWER PIPE AND FITTINGS</th>
<th>REFERENCED STANDARDS PIPE</th>
<th>REFERENCED STANDARDS FITTINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS (Schedule 40)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ASTM D2661, ASTM D2680*</td>
<td>ASTM D2661, ASTM D2680*</td>
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<td>ASME B16.12, ASTM A74, ASTM A836, CSPI 301</td>
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<td>X</td>
<td>ASTM F891</td>
<td>ASTM D2665, ASTM F794, ASTM F1846</td>
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<td>Galvanized Malleable Iron</td>
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<td>X</td>
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<td></td>
<td></td>
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<td>Galvanized Steel</td>
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<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Polyethylene</td>
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<tr>
<td>PVC (Schedule 40)</td>
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<td>X</td>
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<td>Stainless Steel 304</td>
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<td></td>
<td></td>
<td>ASME A112.3.1</td>
<td>ASME A112.3.1</td>
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<tr>
<td>Stainless Steel 304L</td>
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<td></td>
<td></td>
<td>ASME A112.3.1</td>
<td>ASME A112.3.1</td>
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<td>Vitrified Clay (Extra strength)</td>
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<td></td>
<td></td>
<td>ASTM C700</td>
<td>ASTM C700</td>
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</table>

*For building sewer applications.
When is Mechanical Plan Check Required by LADBS?
Building Card

Mechanical Plan Check
• Approved stamped mechanical plan check plans of job site (if required)

• This is a requirement for underground, rough and final plumbing inspections. Always verify pipe sizes off the riser diagram!
Plumbing Jobs May Have Different Requirements

Approved stamped **Health Department** and / or **Industrial waste** plans on job site (if required)

**Health Department**
- Restaurants
- Bars and Nightclubs
- Food Sales
- Cisterns
- Reclaimed Water
- Backflow Protection etc...

**Industrial Waste**
- Restaurants
- Auto Shops
- Dental Facilities
- Laundry Mats
- Gyms
- Pet Grooming
- Cafeterias etc…
GREASE INTERCEPTOR AND SAMPLE BOX

Grease Trap

Flow Control
FOG PLAN CHECK
BUREAU OF SANITATION
INDUSTRIAL WASTE MANAGEMENT

1. PERMIT REQUIRED - Yes □ No □
   Permit Number: 50-316

2. INTERCEPTOR WITH SAMPLE BOX REQUIRED - Yes □ No □

3. GREASE TRAP REQUIRED - Yes □ No □
   Approved by: Senior Industrial Waste Inspector
   Date: 7/4/17

Comment: Grease Trap Location must be approved by LACOFH.
• **Grease Removal/Retention Device** - A plumbing appurtenance or appliance that is installed in a sanitary waste system to intercept nonpetroleum fats oils and greases (FOG).

• **Gravity Grease Interceptor** - A gravity grease interceptor is a large (500-4,000 gallon capacity) tank which is generally located outside and placed in a location which is easily accessible for maintenance and repair (Building permit in addition to a plumbing permit required).

• **Hydro-mechanical Grease Interceptor** - A hydro-mechanical grease interceptor is a much smaller tank (20-50 gallon capacity), which is generally located inside the kitchen area adjacent to fixtures being served.
719.0 Cleanouts

719.1 Locations. 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 extended to grade.

Additional building sewer cleanouts shall be installed at intervals not to exceed 100 feet (30 480 mm) in straight runs and for each aggregate horizontal change in direction exceeding 135 degrees (2.36 rad).
Cleanouts are required at upper terminal of horizontal lines.

Upper Terminal less than 5' (1524 mm) - a cleanout is not required.

Kitchen Sink
Less than 5' (1524 mm). However, cleanouts are required for sinks and urinals

A cleanout is required at the junction between the building drain and the building sewer.

This angle exceeds 135° (2.36 rad) - a cleanout is required.

FIGURE 707.4
CLEANOUT REQUIREMENTS
(707.4) A clean-out is now required above the fixture connection fitting serving a Urinal, regardless of the location in the building:

Even if Urinal is directly above main drain which is equipped with c/o

(707.9) Clearance in front of clean-outs:

≤ 2” diameter piping to be 18” (instead of 12”)

> 2” diameter piping to be 24” (instead of 18”)

If under-floor, max 5’ from access (instead of 20’)
723.0 **Building Sewer Test.**

723.1 General. Building sewers shall be tested by plugging the end of the building sewer at its points of connection with the public sewer or private sewage disposal system and completely filling the building sewer with water from the **lowest to the highest point thereof**, or by approved equivalent low-pressure air test. Plastic DWV piping systems shall not be tested by the air test method. The building sewer shall be watertight.
Backwater Valve.

A device installed in a drainage system to prevent reverse flow.
The Plumbing Code states: when the FLOOR is located below the next uphill manhole cover.

TYPICAL SITUATION WHERE A BACKWATER VALVE IS NECESSARY.
FIGURE 311.1
INDEPENDENT SEWER CONNECTIONS AND EXCEPTION

Each lot with buildings must have a connection to a public sewer.

Not Permitted

LOT 1

LOT 2

LOT 3

LOT 4

Existing Sewer

Existing Building Drain

Existing Building Drain

New Sewer

New Building

New Building

New Building

Building

Building

Building

May be permitted per Section 312.0 exception
TYPICAL WATER CLOSET ROUGH-IN METHODS

Diagram showing various plumbing configurations for water closet rough-in methods.
• Building rain water drains, size, and test (water or air)

• Proper grade, alignment, staking, approved bedding and back fill materials for all underground piping

• Sewage ejector and/or sump pumps, size of pit, material, discharge piping, venting (if installed)
Horizontal or edge-to-edge separation: Minimum 12 inches at all points.

Vertical or elevation difference: Minimum 12 inches at all points.

**FIGURE 609.2**
WATER AND SEWER LINE SEPARATION
• Trap diameter = trap arm diameter (1003.3)

• One size larger for both is OK to allow for longer trap arm (1003.3)

• Trap seal protection rules (1007.1)

• Trap arm to connect to drain and vent through a directional fitting (706.2)
• Vent to protect trap seal from siphon (901.2, 1002.1)

• Building drain definition and slope (1/4”; 1/8”), do not reduce size or restrict flow (gravity) (204,708.1)

• Building sewer (2 ′ outside building) (204)
Correct Venting with the Vent Opening Above the Trap Weir

Water Closet Rough-In Method, Maintaining Vertically Rising Vents (Vent Opening Below the Trap Weir)
<table>
<thead>
<tr>
<th>TRAP ARM PIPE DIAMETER (inches)</th>
<th>DISTANCE TRAP TO VENT MINIMUM (inches)</th>
<th>LENGTH MAXIMUM (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/4</td>
<td>2 1/2</td>
<td>30</td>
</tr>
<tr>
<td>1 1/2</td>
<td>3</td>
<td>42</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>60</td>
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<td>3</td>
<td>6</td>
<td>72</td>
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<tr>
<td>4</td>
<td>8</td>
<td>120</td>
</tr>
<tr>
<td>Exceeding 4</td>
<td>2 x Diameter</td>
<td>120</td>
</tr>
</tbody>
</table>

For SI units: 1 inch = 25.4 mm

Notes:
1. Maintain 1/4 inch per foot slope (20.8 mm/m).
2. The developed length between the trap of a water closet or similar fixture (measured from the top of the closet flange to the inner edge of the vent) and its vent shall not exceed 6 feet (1829 mm).
FIGURE 1002.3
“DIRTY ARM” - USE ONLY DURHAM-STYLE FITTING
• **711.0 Suds Relief.**

**711.1 General.** Drainage connections shall not be made into a drainage piping system within 8 feet (2438 mm) of a vertical to horizontal change of direction of a stack containing suds-producing fixtures. Bathtubs, laundries, washing machine standpipes, kitchen sinks, and dishwashers shall be considered suds-producing fixtures. Where parallel vent stacks are required, they shall connect to the drainage stack at a point 8 feet (2438 mm) above the lowest point of the drainage stack.

**Exceptions:**
(1) Single-family residences
(2) Stacks receiving the discharge from less than three stories of plumbing fixtures

• **Wet Vents (If Required)**
VERTICAL WET VENTS

1. Same floor
2. 6’
3. Drain from 1 or 2 FU-type fixture
4. Water closet at bottom
5. To vent a maximum 4 plumbing fixtures
6. Increase 1 pipe size than required
7. Not less than 2”
Vent terminology

- toilet
- basin
- branch vent
- vent stack
- stack vent
- slope
- wet vent
- soil stack

Slope 1/4" per ft.
Underground water supply, material, size and types of joints (outside and inside of the building)

604.10.1 **Tracer Wire.** Plastic materials for building supply piping outside underground shall have a blue insulated copper tracer wire or other approved conductor installed adjacent to the piping. Access shall be provided to the tracer wire or the tracer wire shall terminate aboveground at each end of the nonmetallic piping. The tracer wire size shall be not less than 18 AWG and the insulation type shall be suitable for direct burial.
## Approved Materials for Water Supply and Distribution

### Table 604.1

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>BUILDING SUPPLY PIPE AND FITTINGS</th>
<th>WATER DISTRIBUTION PIPE AND FITTINGS</th>
<th>REFERENCED STANDARD(S) PIPE</th>
<th>REFERENCED STANDARD(S) FITTINGS</th>
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<tbody>
<tr>
<td>CPVC-AL-CPVC</td>
<td>X</td>
<td>X</td>
<td>ASTM F2855</td>
<td>ASTM D2846</td>
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<td>Ductile-Iron</td>
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<td>AWWA C151</td>
<td>ASME B16.4, AWWA C110, AWWA C153</td>
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<td>Galvanized Steel</td>
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<td>PE-AL-PE</td>
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<tr>
<td>PE-RT</td>
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<td>ASTM F2769</td>
<td>ASTM F1807, ASTM F2098, ASTM F2159, ASTM F2735, ASTM F2769</td>
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<td>PEX-AL-PEX&lt;sup&gt;4&lt;/sup&gt;</td>
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<td>ASTM F1281, ASTM F1974, ASTM F2434, CSA B137.10</td>
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<td>PP</td>
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<td>ASTM F2389, CSA B137.11</td>
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<td>X</td>
<td>ASTM A269, ASTM A312</td>
<td>—</td>
</tr>
</tbody>
</table>
TRAP PRIMERS

- Needed for floor drains and floor sinks (subject to infrequent use) (1007.1)
  - Toilet rooms
  - Mechanical rooms
  - Laundry rooms
- Not needed for commercial kitchens
- Need backflow device (vacuum breaker) on water supply
WATER

• Yard water piping 12” deep (609.1)

• If copper pipe under slab, type “L”, no joints if possible, if not, brazed joints (604.3 & 609.3)

• Test pressure is working pressure or 50 psi air. No air testing of plastic pipe (609.4)
GAS

- Black, galvanized, PE outside (no PVC), CSST, Cu not allowed (0.3 grains H₂S/100scf) (Protect tubing (CSST) in walls with striker plates) (1208.5)

- If underground, machine coated or wrapped, joints wrapped (w/20 mils of tape). If plastic underground, metal riser wrapped with listed transition coupling or listed transition riser (Anode less Risers) (1208.5.6&1210.1.3)

- 18” cover, if damage unlikely 12”, if not possible in a conduit, tracer wire one end (1210.1.1)
**Waste and Vent Test (Water or Air)**

10’ of head pressure or 5 psi of air. If using air the pipes must be metallic

Confirm all waste and vent sizes

Wet vents (if installed)

Suds relief (if required)

Relief vent stacks-yoke vent connections (if required)
Minimum length = 18" (457 mm)

Maximum length = 30" (752 mm)

Minimum height above floor = 6" (152 mm)

Maximum height above floor = 18" (457 mm)

Clotheswasher Standpipe Receptor

Trap below floor prohibited
Vent terminations

Opening window door, opening air intake, or vent shaft

10 ft. min.

12" min.

6" min.

3 ft. min.

Property Line

Parapet Wall

Wetproof Flashing

Opening window door, opening air intake, or vent shaft

3 ft.min.

6" min.

12" min.

Wetproof Flashing

FIGURE 906.0
VENT TERMINATION THROUGH THE ROOF
• Roof drain to storm drain (except SFD) & secondary can daylight

• Roof drain (primary) & overflow (secondary) 2” above (if water is trapped), primary & secondary to be separated (Could join if at vertical, twice rain fall rate & connect to public underground storm drain) (1101.12)

• Scupper in lieu of overflow (4” high x circumference) (1101.12.2.1)

• Materials, cleanouts and testing similar to DWV (1101.4) (1101.13)
Verify roof drains, overflow drains, piping materials, size, and terminations.
• Water supply branches and materials
• Water supply size and location per approved plans
• Pressure regulator material, size and location
• All water piping secured and properly supported
• Sound isolation for all waste, vents and water piping (where required by building code)
• Maximum water pressure 80 psi, if more: regulator (pressure reducer); if less than 15 psi: pump (608.1&.2)

• If regulator w/o bypass (or if check valve): expansion tank required (608.3)

• If water heater (other than instantaneous): T&P valve to discharge to 6”-24” above grade or via air gap to floor sink and not to crawl space, pointing down-no trap. (608.3&.5)

• Vacuum relief if WH is above fixtures (608.7)
Fire stopping (where required by building code)
Tub and/or shower pan test
• Dam, 2” - 9”;
• Slope floor 1/4” - 1/2” per foot
• 30” circle (70”); 1024 sq in area min
• 22” door opening
• Hot mop: 3 layers 15 # felt, 3” above dam & slope to weep holes in drain (or listed lining)
• (24) hour test – Drain through weep holes
• Control valve (pressure or temperature)
• 2” waste – Verify the drain body
Pressure Vessel Permits Obtained (if required)

- 210 degrees F
- 160 PSI
- 120 Gallons
- 400,000 BTU’s
• Approved location of WH vent termination
• Required combustion air for water heater
• Water heater size and location
• WH vent installed per manufacture installation instructions including approved materials
• Gas meter location

• Gas piping materials

• Gas piping size and location

• Gas piping secured and properly supported

• Required gas air test (after all walls and ceiling are covered and scaffolding is removed. Test again @ final inspection
FINAL PLUMBING INSPECTION TIME!
• Sewage and/or sump pumps sized and installed properly per approved mechanical plan checked plans

• Strainers installed on all roof and overflow drains

• All fixtures, appliances and/or devices of approved type

• Fixtures in contact with walls and floors secured and sealed

• Fixtures and appliances installed at approved locations
• Disabled access requirements per the building code
• Traps to be approved type, set true to their water seal and with proper grade
• All fixtures filled and ready for test
• All gas appliances connected – Watch the BTU’s
• Water heater properly secured
• WH vent connector
• Combustion air
• Approved louvers and/or grilles sized for required combustion air openings
• WH vent cap installed
• Approved SGSOV installed and secured to building
• All gas supplies properly ID at gas meter locations

• FINAL GAS TEST -

• Gas released to Southern California Gas Company after our mechanical and fire sprinkler divisions approval
FINAL PLUMBING AND GAS OK
THANK YOU!

Brandon Ives
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Plumbing Training Officer

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