Inspection Standard for Tuolumne County - Frame Inspection

What you should know before calling for an inspection.

Presented by,
Doug Oliver
Chief Building Official
County of Tuolumne

What We'll Cover:

- Inspection Flow
- Weather protection
- Damage to structural components
- Fire safety/Egress
- Green Building/Energy issues
- Trades
  - Electrical
  - Plumbing
  - Mechanical

- Prevailing Documents
  - 2013 California
    - Building Code
    - Residential Code
    - Electrical Code
    - Mechanical Code
    - Plumbing Code
    - Green Building Standards
    - Energy Code

Did we find your project?

- Address must be posted per County Standard for all inspections
  - 4 inch stroke
  - ½" lettering
  - Contracting, reflectorized background

The Inspection "Flow"

- Exterior "at a glace"
- Previous Correction Items
- Room by Room (establish a pattern)
  - Trades
  - Damage
  - Fire protection
  - Energy compliance
  - Green building
  - Sprinklers
- Equipment!

Exterior at a glace

- Does it look ready?
  - Weather wrap complete
  - Windows installed
  - Doors installed
  - Roof installed (including roof jacks to plumbing penetrations)
  - Penetrations sealed:
    - Exterior electrical boxes
    - Jacks installed for condenser line-set

To Move Forward

- If tile roofing:
  - We allow the felt and batts to be complete with tile material spaced evenly across roof area.
  - There is a good reason!
- Some minor omissions become correction items.
- Major omissions mean not ready.

Now that we're inside

- We check all previous correction items before starting new inspections. Noting each item completed and what is remaining to gauge if we can sign off previous inspections and whether remaining corrections will prevent allowing project to continue to insulation inspection.
- Ideal situation: all items are complete!

Are we ready?

- Working water pressure or 50 PSI air required on domestic water system.
- Standing water test on plumbing system required. Fill to top of the bathtub overflow.

Room by Room- Basics

- Framing and damage
- Fire-blocking/Draft-stopping
- Electrical
- Mechanical
- Fire protection

Room by Room-Framing and Damage

- We re-check notching and boring requirements as well as damage to any shear/bracing element as a result of installation of plumbing, electrical, or mechanical equipment.
- Plate lap can also change as a result of over-boring for plumbing vents and metal wall ducts.
- Plus: we recheck anchor bolt and hold-down tightness. The wood has generally shrunk by now!

Room by Room – Framing and Damage

- Fire Blocking and Draft Stopping is one of the most important things we do in the frame inspection.
- In general, all wall cavities must be sealed off from concealed spaces, under floor areas, floor systems, and attics to prevent the spread of fire.

Fire Blocking “hit list”

- Tub enclosure to wall
- Drop-ceiling to wall
- Wood floor bath tub trap opening
- Duct and chimney chases
- Fireplace platforms and penetrations
- Framed entertainment center enclosures.
- Top plate/sill plate penetrations for romex (may be sealed at insulation inspection)

Typical fire-blocks

- Mineral-wool insulation
- 5/8″ type X sheet rock
- ¾″ plywood
- 26 gauge metal

Don’t forget the draft-stops!

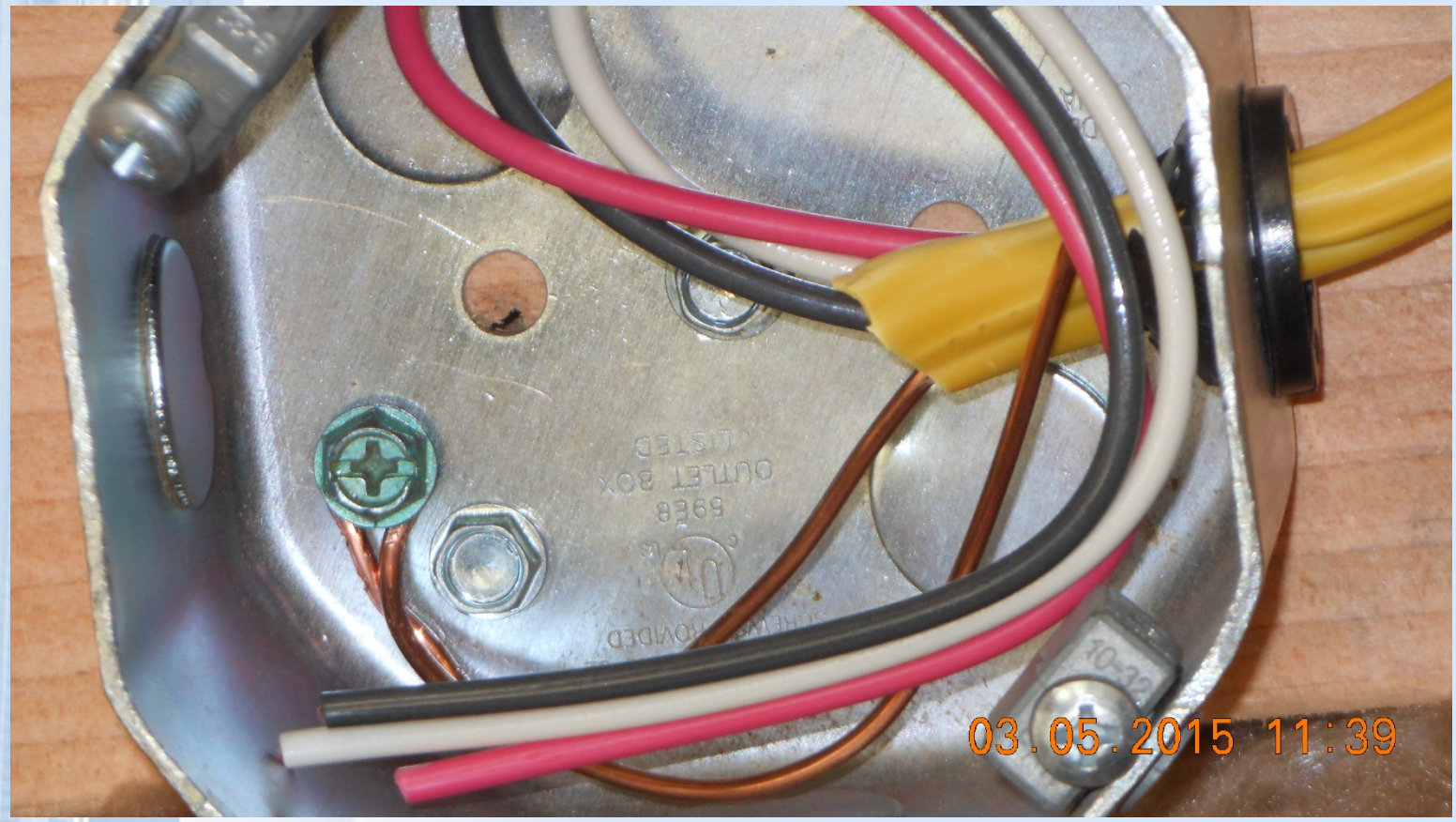
- Every 1,000 square feet of concealed space!
- Watch out if using open trusses instead of solid joists for floor systems!

Room by Room - Electrical

- Basic electrical installation is checked
  - Plug spacing
    - Common error: 2 ft wall spaces
  - Plug/switch/lighting location
  - Size and placement of conductors
    - Different for residential than commercial!
  - Minimum of 6” of conductor sticking out of the face of the box.
  - Box fill
  - Grounding of receptacles, light boxes, and switches. *Everything with a grounding lug must be grounded!*

Box Fill example

Correct Grounding



Incorrect grounding

Nail plates

Can lighting

- If recessed can lights are installed in insulated ceilings, the luminaries must be labeled “IC Rated” or be provided with a boxed out enclosure that prevents insulation from contacting luminaries.

Room by Room - Mechanical

- All air registers must be blocked on 4 sides.
- Return air registers must be 3 ft. from smoke detector box.
- All ductwork is installed correctly
  - Correct support
  - No tears
  - Correct type

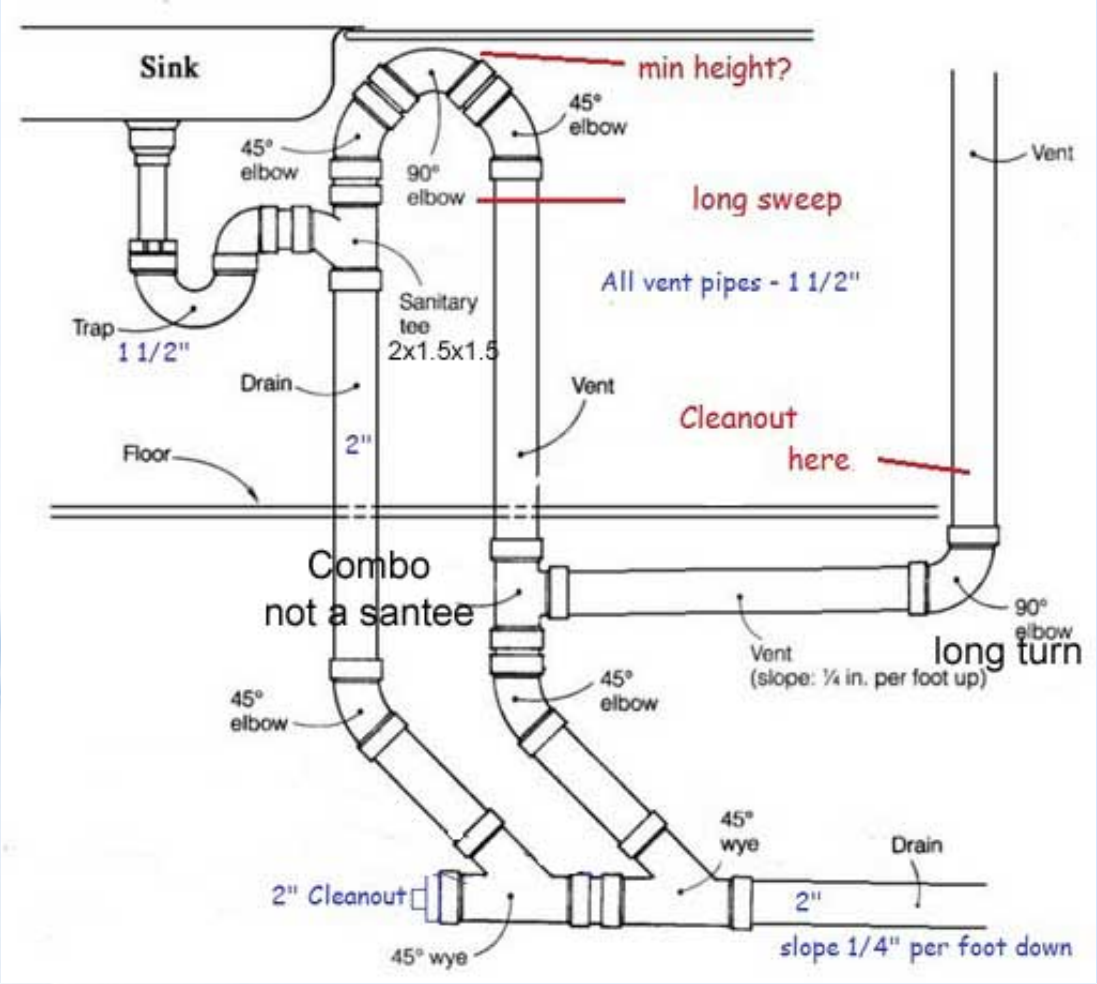
Fire Protection

- All windows must have at least one pane tempered to comply with Wild-land Urban Interface requirements.
- Smoke detector/CO detector prewired locations.
- Solid Core/20 minute exterior doors
- Sprinkler installation (can be a separate inspection):
  - Head type and location
  - Piping system size, type and support

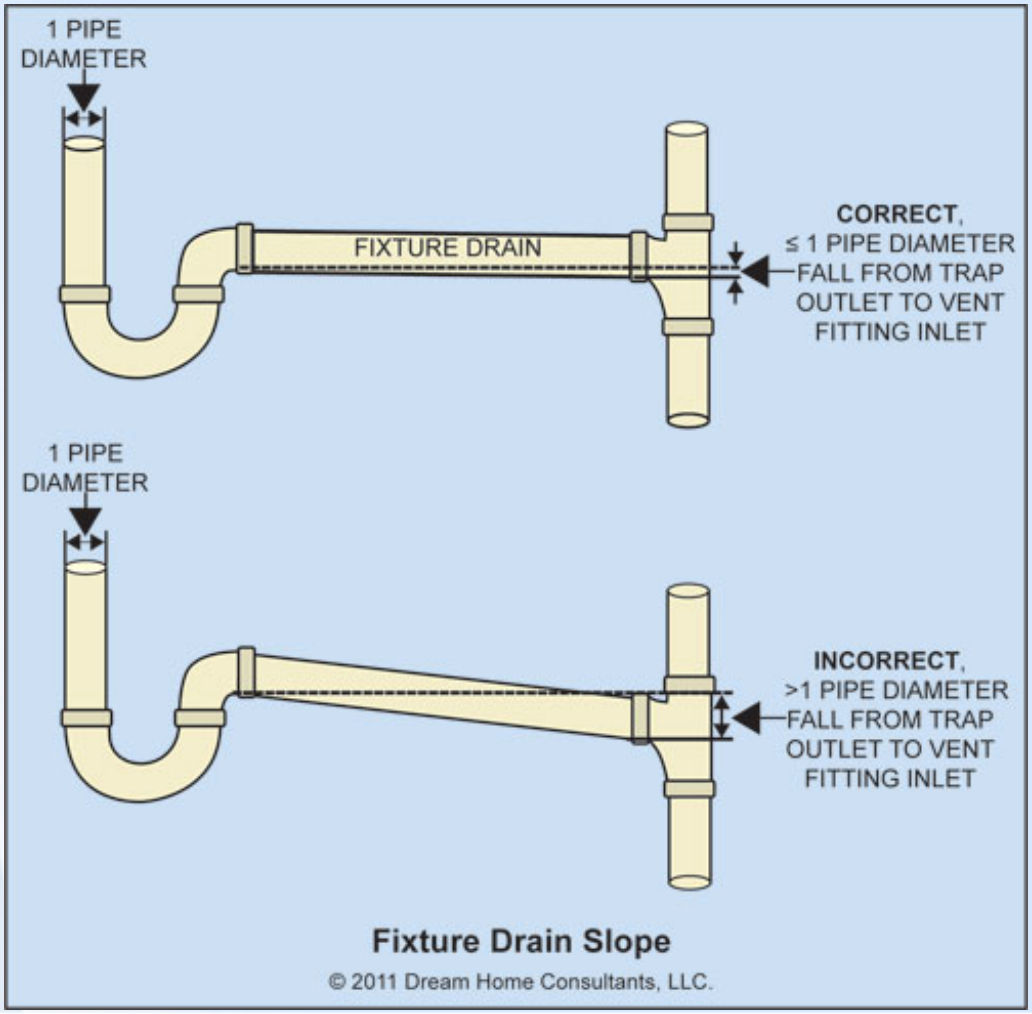
Room by Room – Kitchen Specifics

- Foot/loop Vents
- Basic Plumbing
  - Vent heights
  - Trap arm lengths
- (2) #12 AWG circuits minimum
- Island plumbing and electrical stub ups
- Kitchen exhaust vents
- Gas piping
- 30/50 amp receptacles for cooking equipment

Loop vent


Sink
min height?
45° elbow
45° elbow
90° elbow
Vent
long sweep
All vent pipes - 1 1/2"
Sanitary tee 2x1.5x1.5
Trap 1 1/2"
Drain
Vent
Cleanout here
Floor
2"
Combo not a santee
90° elbow
long turn
Vent (slope: ¼ in. per foot up)
45° elbow
45° elbow
45° wye
Drain
2" Cleanout
2"
45° wye
slope 1/4" per foot down

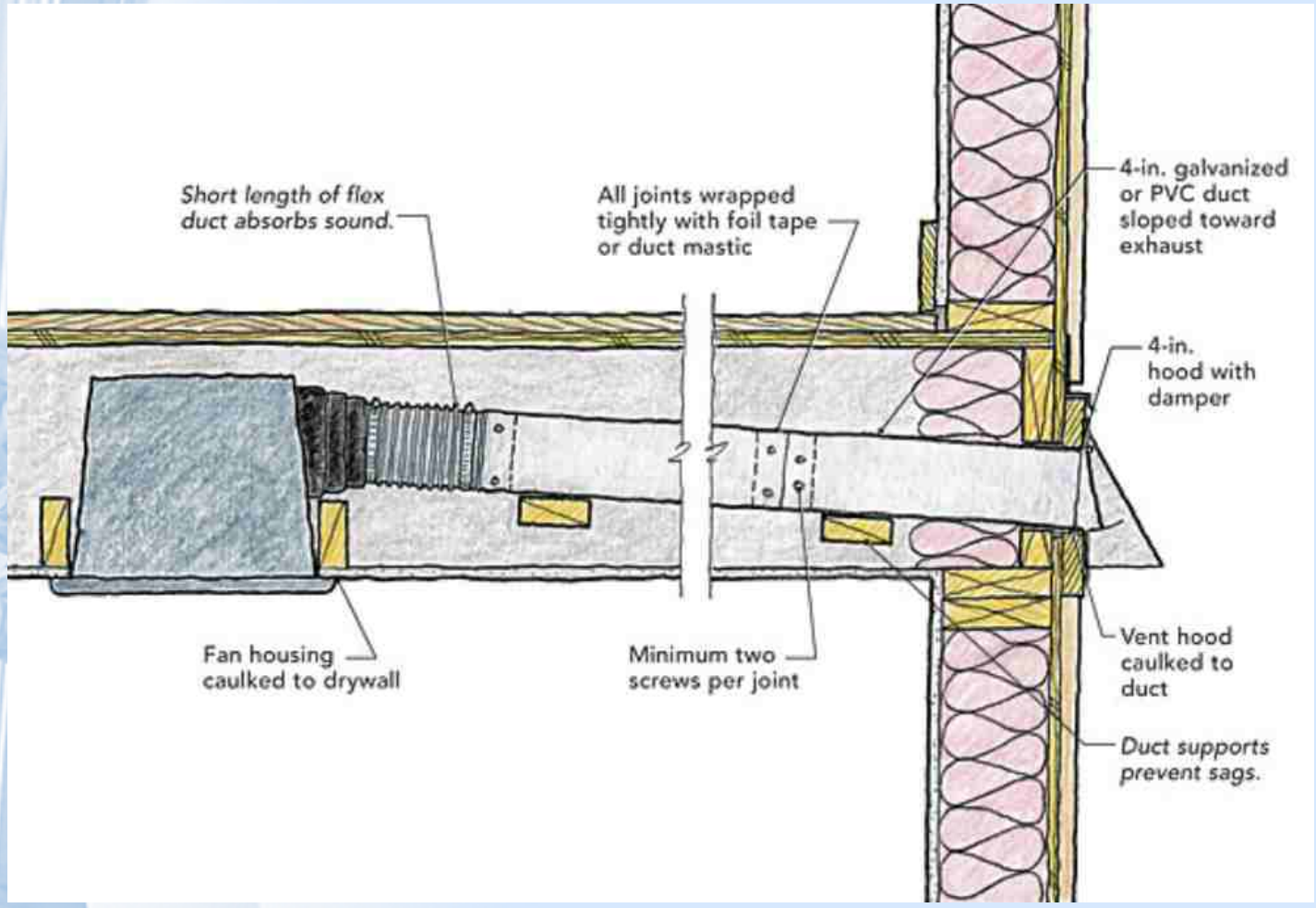
Trap arm requirements



Hot water piping

- Must be insulated for entire length
  - 5′ rule no longer applies

Exhaust vents



Gas piping

- In general, gas piping is inspected for correct size, support, and termination.
- Additionally, gas piping must not come into contact with any other metallic piping system.
- Gas piping test must be ready at Frame inspection:
  - 10 psi for 15 minutes
  - ½ lb increment gauge max.

240 volt kitchen outlets

- 30/50 amp appliance outlets are inspected for:
  - Correct conductor sizes
  - 4-wire circuit
  - Correct box and termination

Room by Room – Bathroom specifics

- Dedicated GFI circuit.
- Exhaust fan required.
- Tub water test.
- Shower pan.
- Basic plumbing

Bathroom GFI requirements

- Can include lighting unless one GFI is used to protect multiple bathrooms, then lighting and outlets must be separate circuits.
- Regardless of GFI protection, outlets and switches not allowed in the tub/shower area! No exceptions!
- Lighting in showers must be luminaires suitable for wet locations. Sealed lenses checked at final
- Fans will be checked at final for compliance over tubs.

Exhaust fan required!

- Regardless of the presence of a open able window, exhaust fans are now required.
- We inspect for:
  - Wood blocking on three sides of fan unit.
  - Correct electrical installation.
  - Correct termination of exhaust duct.
    - Cannot terminate in attic or at a attic vent!
    - Must terminate in approved fitting/flange.

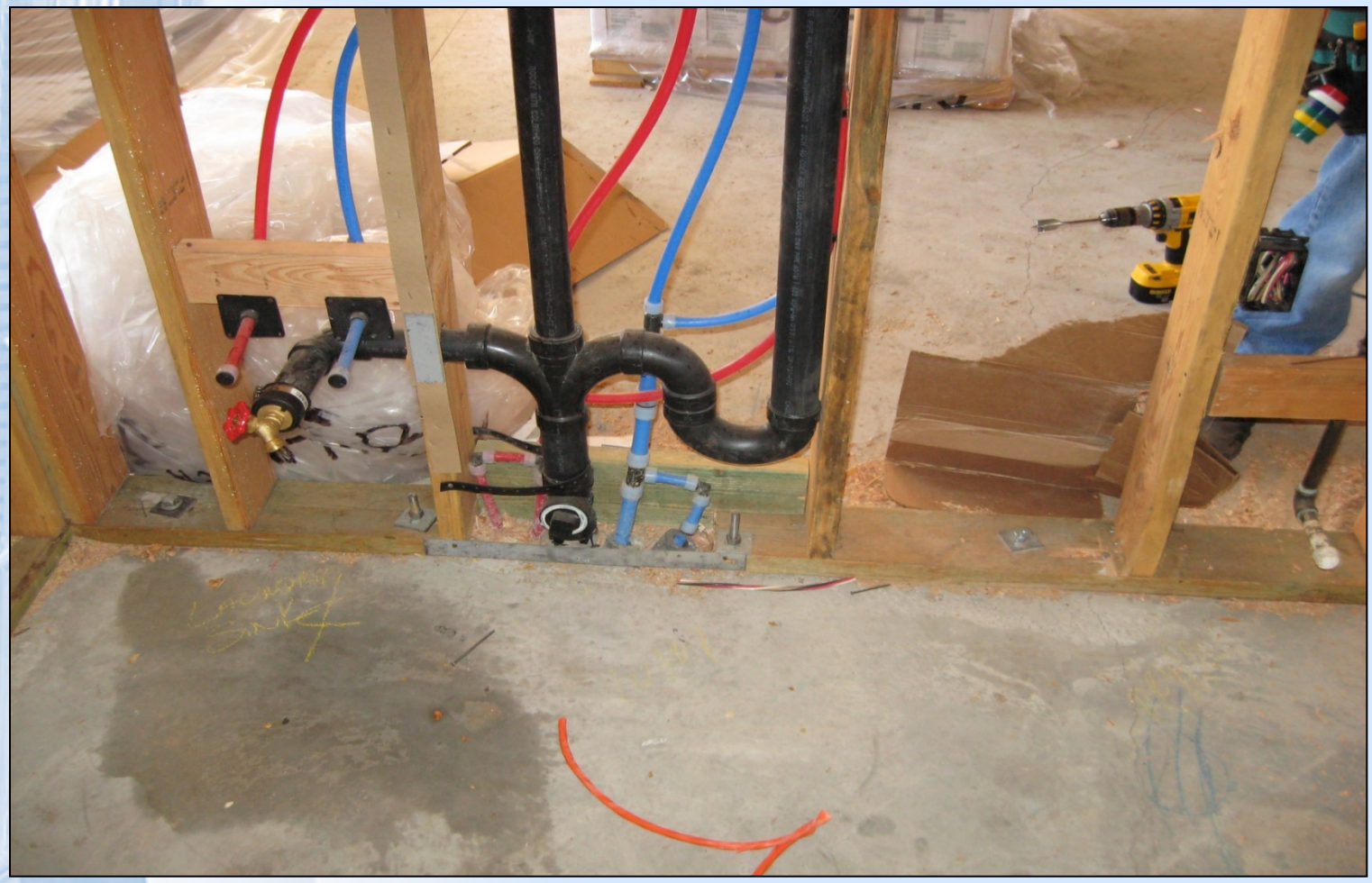
Tub test

- Water test must include tub overflow to identify leaks.
- Now's a good time to check the tub trap for rodent-proofing!
  - Slurring seal slab-on-grade
  - ¼ metal mesh at floor penetrations

Shower Pan Install

- 15 minute test with standing water to the top of the threshold with no leaks detected.
- Must drain completely with no ponding water in any area.
- All weep holes must function.
- Shower pan products not identified in code must be installed per manufacturers instructions!

Plumbing example



Laundry Room Specifics

- One GFI Circuit required!
- 240 receptacles inspected similar to kitchen.
- Dryer ducts
- Clothes washer standpipe

Dryer Duct

- #1 cause of house fires!
- Length Limit 14 foot
- Deduct 2 feet for every 90 degree bend you use after the 2nd!

What's wrong with this standpipe?

Garage Specifics

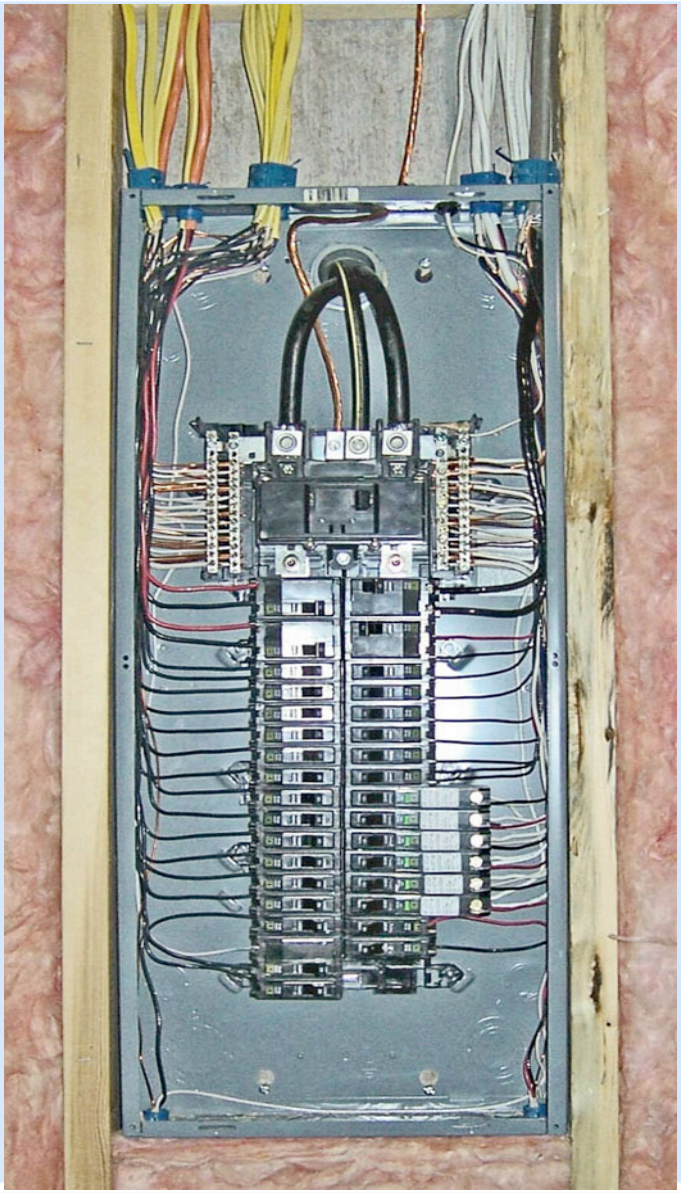
- Electrical panel
- Sprinkler riser
- Domestic water entrance
- Gas piping entrance
- Fire protection
- Equipment platforms

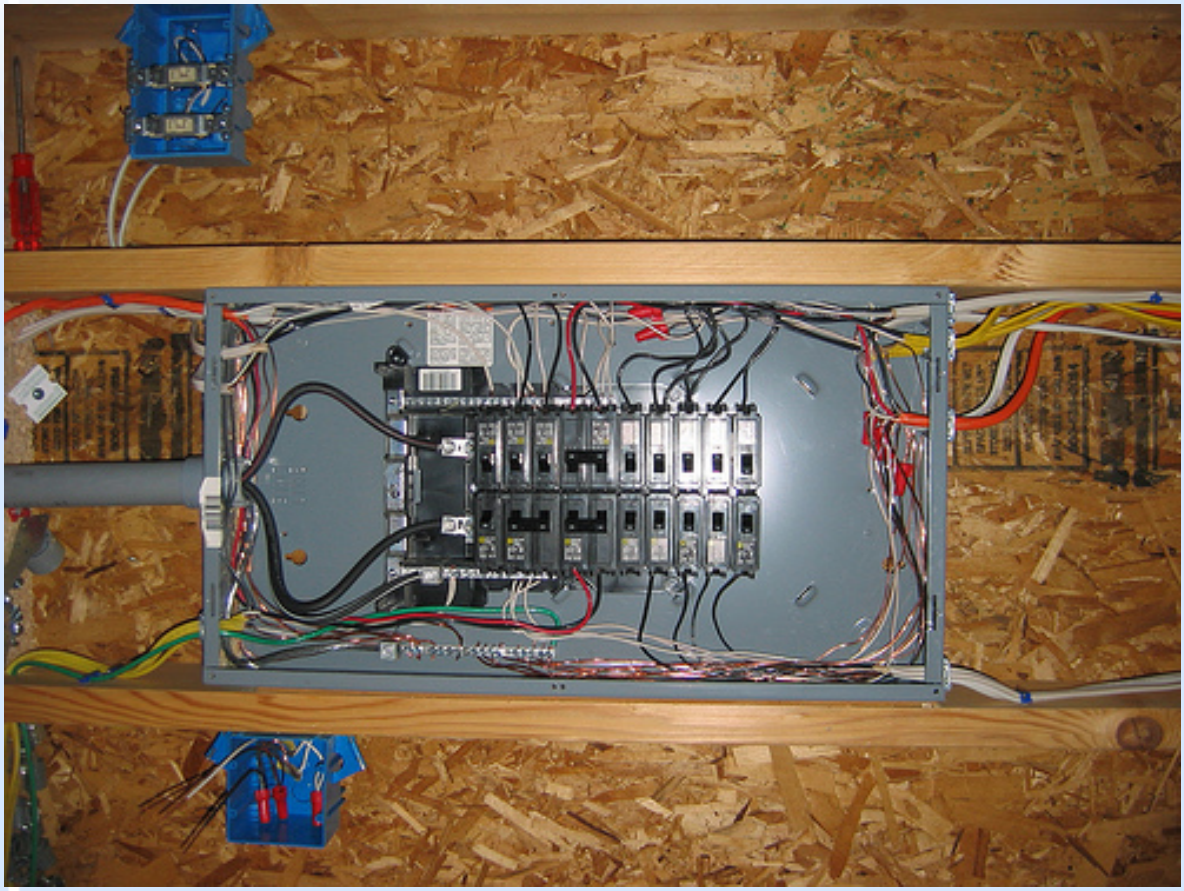
Your Service Panel (include subpanel)

- Inspection Items:
  - Panel rating (read the label!)
  - Panel location
  - Service entrance conductor sizes and installation
  - Feeder sizes and installation
  - Rod or Ufer ground
  - Size and location of grounding electrode conductor, water bond, gas bond.

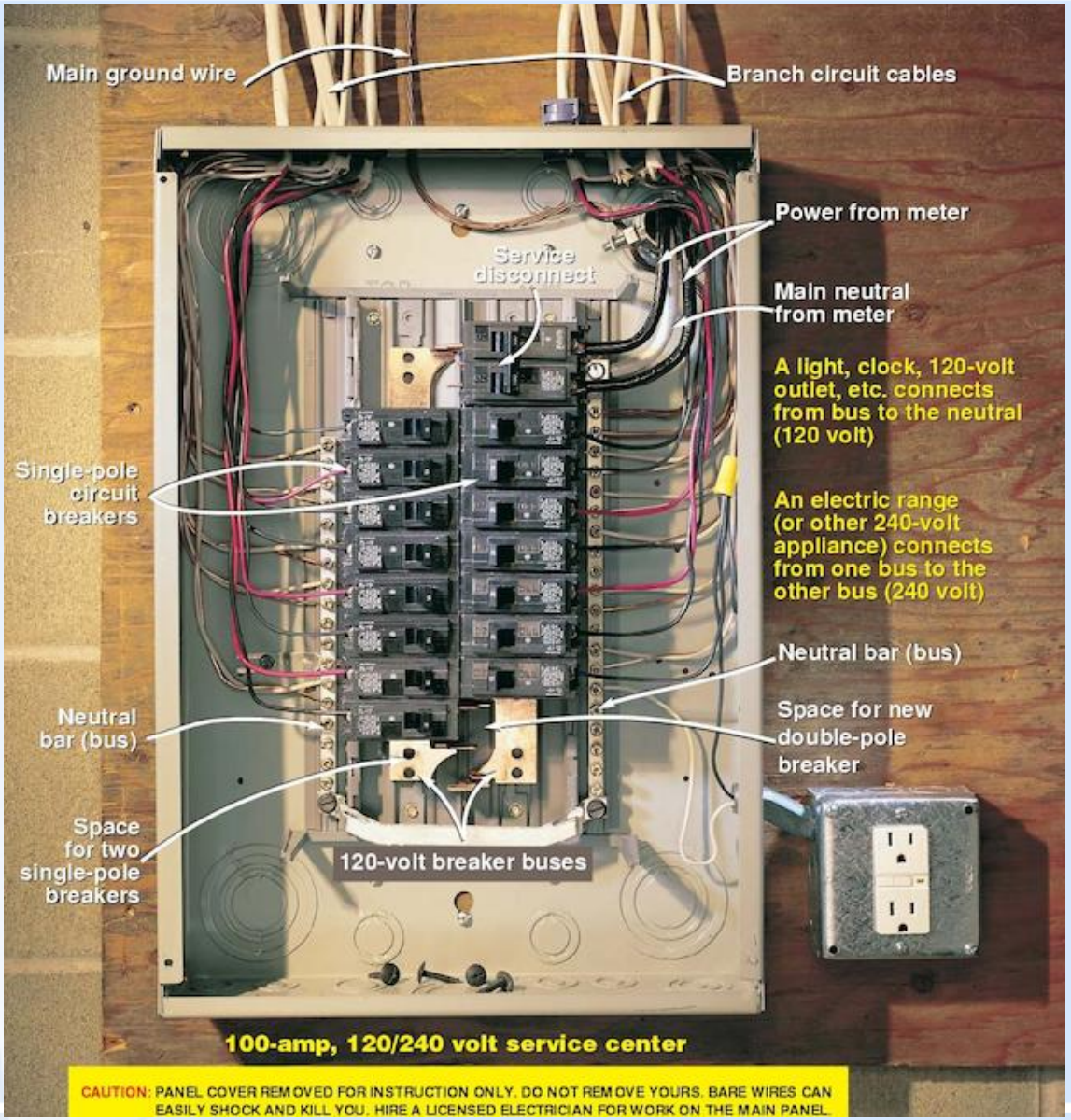
Branch circuits are not expected to be completed at this phase unless a temporary power inspection is requested.

Example

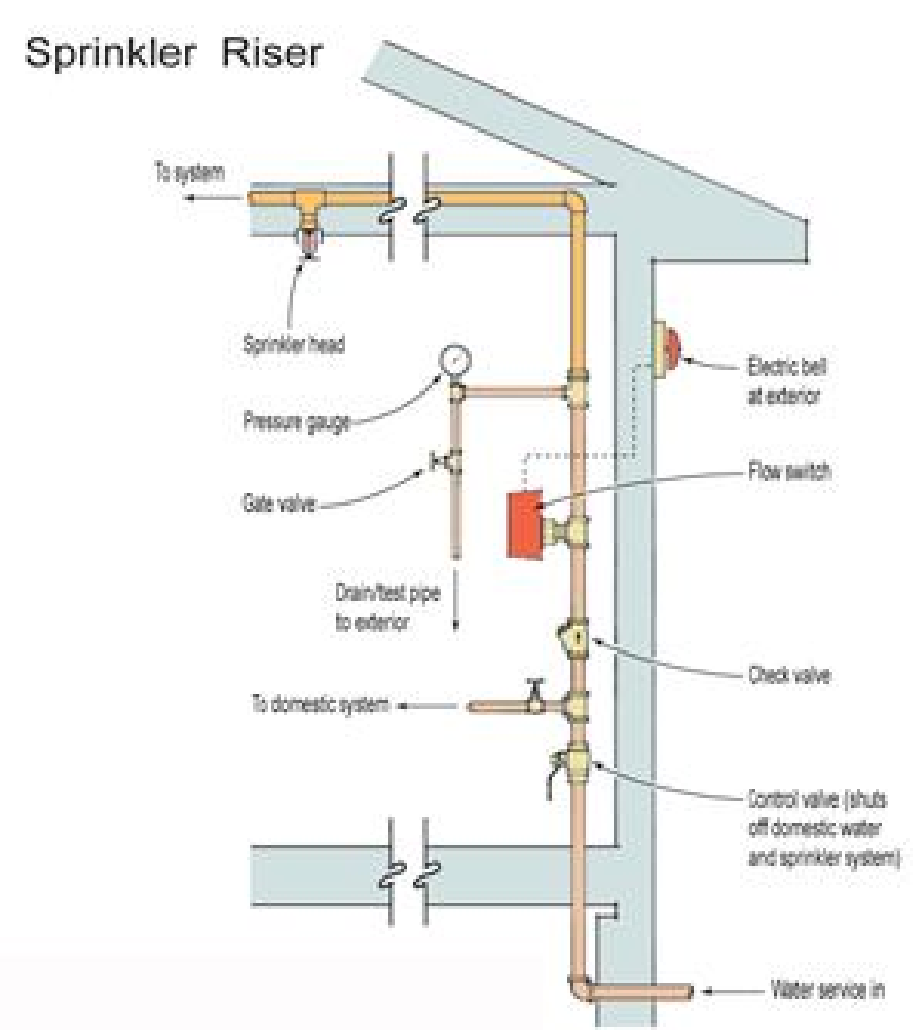




What are you doing, Bob?



Sprinkler riser example



Domestic water

- Water system must transition to material approved for inside a structure BEFORE it enters the wall or foundation of the structure.
- In addition, water systems installed in the structure that are damaged by sunlight cannot exit the wall of the structure to connect to the main water supply, use appropriate transition fittings.
- Pex main service lines must be sleeved in another piping type if buried. (California specific language)

Gas Piping

- See Gas Piping Inspection training for everything you need for this phase. Today were focused on building entrance and testing.
- Best place to bond is at the building entrance or at the water heater.
  - Unless you have grounded equipment

Fire Protection

- Sprinkler heads required if garage is attached to the residence
- All electrical outlet boxes must extend beyond the stud face for install of sheetrock and cover plate
- Plumbing penetrations must be metal fittings.
- Garage door must be non-combustible (WUI). If not installed, will be checked at final.

Equipment platforms

- 18” above the garage floor.
- Cannot be used as a plenum
- If in the path of the garage door, must provided with crash protection (3” concrete-filled bollard)
- Flue-vent penetrations above platform must be fire-caulked, tight-fitting, or be provided with metal collars.
- Ducts penetrating garage wall or ceiling must be 26 gauge metal.

Equipment Inspection at Frame

- HVAC
  - Condenser not required
  - Line set required
- Fireplace
- Water heater

HVAC – what we look for

- Conductor sizing and install based on nameplate rating:
- Condensate and overflow correctly installed.
- Unit secured
- Overflow pan as required (for water, not gas!)
- Correct duct installation
- Adequate combustion air and proper venting.

Fireplace

- Unit secured
- All clearances from unit to combustible construction per manufacturers instructions
- Not combustible debris on unit or in enclosure.
- Gas pipe and electrical correctly terminated.
- Chimney size, clearances, and support.

Water Heater

- Not required to be installed at frame! However, there's a few things you need to be aware of now:
  - Combustion air
  - Door size for water heater closets
  - Vent location and termination
  - Method of securing unit

Basement install of propane appliances

- Cannot be installed in any basement that cannot be provided with adequate ventilation at the lowest area of the under floor space.
- Overflow pans not allowed for catching propane leaks! Only for water.

Don’t forget the attic!

- Everything we check within the walls is also checked in the attic. In addition:
- Location of attic access
- If equipment is in the attic
  - Light, switch, and maintenance outlet
- Truss plates are sharp! Watch for:
  - Romex on gang plates
  - Tears in ductwork
  - Water pipe on gang-plates

When the inspection is not ready:

- Weather protection is not complete
- More than 5 items found in garage or first room inspected
- More than ten items in first floor of multi-story inspection
- One or more trades not installed
- To many serious correction items from shear inspection not complete
- Permit, Plans, and specs not on site

Questions?