



Plumbing System Planning: Supply to Vent

Water delivery and drainage are different systems with a shared need for honest fixture demand and a coordinated rough-in.

A plumbing rough-in is not complete when the pipes fit in the wall. It is complete when the supply, drainage, and vent systems each handle their intended demand.

Worked example from the live calculator

At 12 GPM over 100 ft, the live pipe-size calculator recommends 3/4 in copper as the smallest option that holds outlet pressure and velocity in range.

Deliver water with usable pressure

Pipe size and friction loss determine what pressure remains at fixtures. Long runs, restrictive fittings, and simultaneous use can turn a nominally adequate supply into poor performance.

Match water heating to the demand pattern

Water-heater capacity depends on peak draw, recovery, fuel, and household use pattern. Tank gallons alone do not prove a system can carry a busy hour.

Drain and vent as a working pair

Drain sizing, required slope, and venting protect trap seals and waste flow. Do not solve a drainage layout by slope alone.

Key takeaway. Supply pressure, hot-water recovery, drainage capacity, slope, and venting are separate checks that must work as one rough-in.

Assumptions

- Fixture units, pipe material, elevation, and local plumbing code determine the final design.

Sources

- IPC or UPC provisions, verify local adoption

Frequently asked questions

Can bigger supply pipe solve every pressure complaint?

No. Supply pressure, friction, valves, and fixture demand all matter.

Why are vents needed?

They manage air pressure so fixture traps remain protected and drainage can flow.

Does this choose pipe materials?

No. Material choice requires local code, compatibility, and installation review.

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