



## HOW-TO BOOKLET #3015

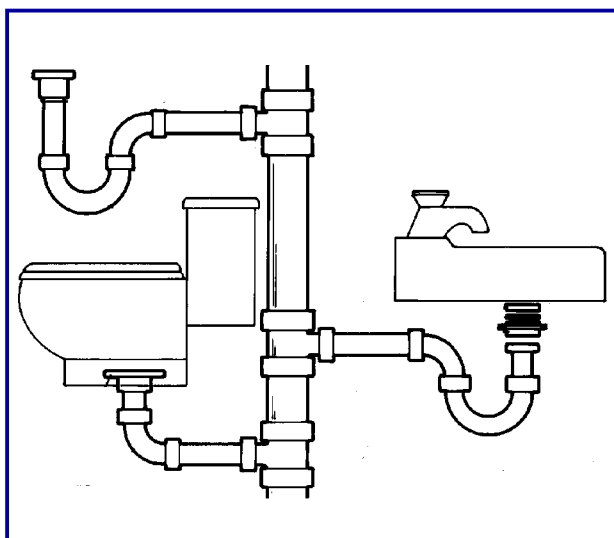
# D-W-V SYSTEMS



### TOOL & MATERIAL CHECKLIST

- |  |   |
|--|---|
| <input type="checkbox"/> Pipe Cleaner  | <input type="checkbox"/> Plastic Drain, Waste, or Vent Pipe |
| <input type="checkbox"/> Pipe Cement   | <input type="checkbox"/> Cement Brush                       |
| <input type="checkbox"/> Tape Measure  | <input type="checkbox"/> Hacksaw/Fine-Tooth Blade           |
| <input type="checkbox"/> Pipe Fittings | <input type="checkbox"/> Miter Box                          |
| <input type="checkbox"/> Sandpaper     | <input type="checkbox"/> China Marker                       |

*Read This Entire How-To Booklet for Specific Tools and Materials Not Noted in The Basics Listed Above.*



The letters DWV in building construction stand for Drain, Waste, Vent. It is that part of a plumbing system that removes waste from a home and vents, at the roof, the odors created by the waste.

Once upon a time, DWV systems were manufactured strictly from cast iron and lead and sometimes copper and brass metals. Today, the products include plastic DWV parts which are especially designed with the do-it-yourselfer in mind. The plastic DWV systems go together as easily as an Erector Set. The products are light-weight, easy to cut and cement, and they are resistant to chemicals and corrosion. The plastic material is also resistant to fungi, bacterial action, and bad soil conditions. In short, plastic DWV systems should be considered when adding any new plumbing to your home that utilizes drain, waste, and vent pipes.

This How-To Booklet deals specifically with the basics of working with plastic DWV materials. These include PVC (polyvinyl chloride), CPVC (chlorinated polyvinyl chloride), and ABS (acrylonitrile-butadiene-styrene). **SPECIAL NOTE:** Plastic pipe and fittings are accepted by most national Plumbing Codes, but some local codes will not accept it. Plumbing codes, sometimes called sanitary codes, are necessary to protect the health of homeowners. The restriction on plastic pipe, if any in your community, probably comes from trade groups— not that the products are inferior. Be sure to check with the Plumbing Department of your community government about these codes before you buy product and start working with it.

## ASSEMBLY PROCEDURES

DWV pipe is easy to assemble fast. Here are the procedures you should follow:

- 1 Measure and estimate the amount and size of pipes and fittings you will need for the project. A chart in this booklet shows what is available.

You will find two types of DWV pipe: Schedule 30 and Schedule 40. Schedule 30 pipe is designed to fit inside a 2x4 stud wall. Schedule 40 is designed to fit inside a 2x6 stud wall. Buy accordingly.

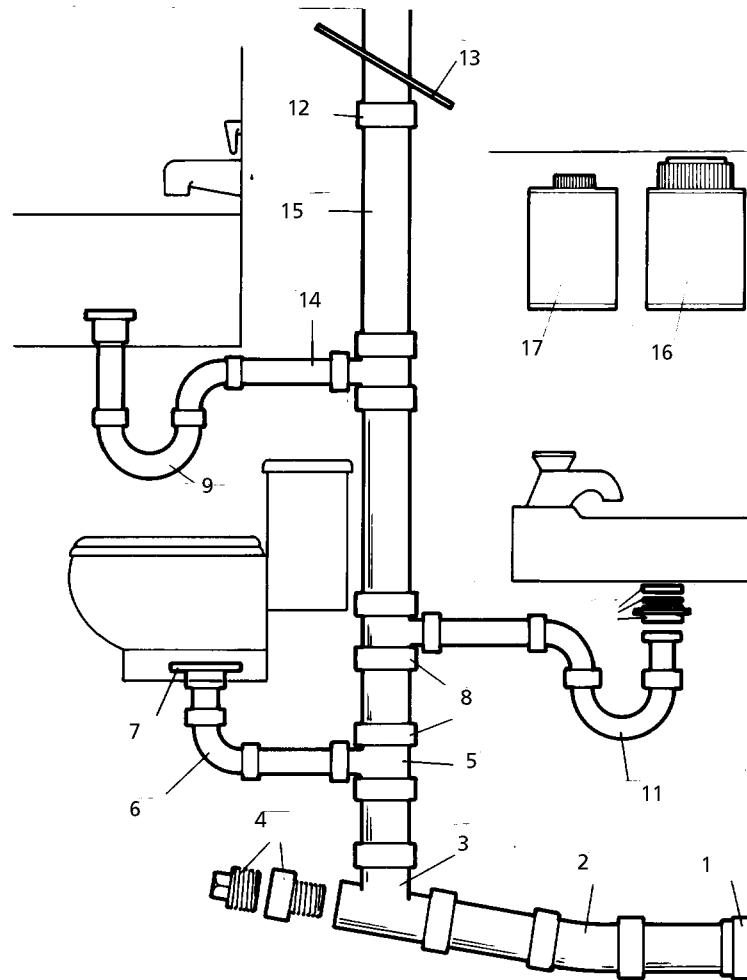
Pipes and fittings are solvent welded. Buy Schedule 30 adhesive for Schedule 30 pipe, or Schedule 40 adhesive for Schedule 40 pipe, or a "universal" cement that may be used for both types.

Because plastic pipe tends to expand and contract with heat and cold, be sure to allow about 1/4-inch clearance in your measurements when running pipe through floors, ceilings, and framing members.

Lengths of larger diameter pipe set horizontally should be supported with hanger straps about every 4 feet or so. Support vertical runs of pipes as needed.

- 2 Measure twice. Cut once. When you are absolutely sure that you have made the right measurements, cut the pipe to size, using a hacksaw with a fine tooth blade set in the saw with the teeth pointing toward the front of the saw frame. The cut should be made on the forward stroke of the saw.

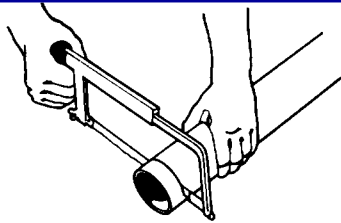
If you have a miter box, use the box to make square cuts. If not, keep the cuts as square as you can.



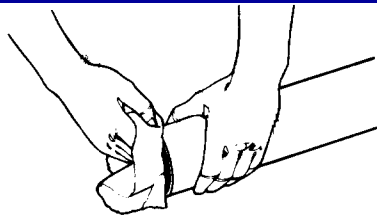
Item No.	Nominal Size	Description
1	3"x4"	Adapter to plastic soil pipe
2	3"	45° Elbow
3	3"x3"x3"	45° Wye (PxPxP)
4	3"	Fitting & Cleanout w/threaded plug
5	3"x3"x3"	Sanitary Tee
6	3"	90° Elbow
7	4"x3"	3" Closet Fitting
8	3"x3"x1 1/2"	Sanitary Tees (Qty. 2)
9	1 1/2"	P Trap w/union (PxSJ)
10	1 1/2"x1 1/4"	Male Trap Adapter
11	1 1/2"	P Trap/90° Elbow
12	3"	Coupling
13	3"	Neoprene Roof Flashing
14	1 1/2"x10'	(ABS or PVC) Pipe
15	3"x10'	PVC Pipe (Qty. 2)
16	1/2 pint	(ABS or PVC) Solvent
17	1/2 pint	PVC Primer

**Parts of a DWV system** are numbered/referenced above. In most installations, you probably will be using 3-inch piping, although the material is manufactured up to 6-inch diameters. At least one manufacturer offers bathroom kits that come complete with all the fittings normally needed for a bathroom DWV installation. Not illustrated here, but readily available, are a variety of fittings for the pipes in a potpourri of styles and sizes to fit almost any design consideration. And, also available, are materials for PVC sewer-septic systems—part of the DWV system.

- 3** Deburr the plastic edges made by the saw cuts. We recommend medium grit abrasive (sandpaper) for this job. We do not recommend a knife or file, both of which can cut into the “good” plastic. The trick is to remove just the burrs; try “buffing” the edges lightly with the abrasive paper.
- 4** Make a “dry” run of the project by assembling the pieces **WITHOUT** adhesive. If the measurement is a tad “long,” you can make cutting adjustments at this point. If the measurement is a tad “short,” you can recut a small length to adjust the run accordingly.
- Also at this time, with a wax China marker, run a short line onto the fittings and the pipe. This mark will be used for aligning the pipe in the fittings when they are assembled with the adhesive.
- When you’re perfectly satisfied that the project fits tightly together, disassemble the pieces.

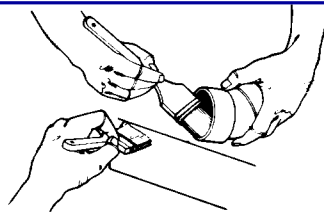


**Cut pipe** to fit after you have measured it twice and marked it accordingly. A hacksaw with fine tooth blade works best. Use miter box, if possible, to make cuts, which should be square.

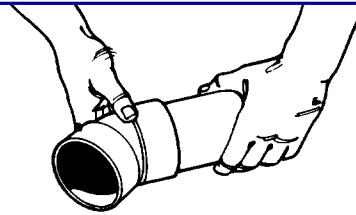


**Clean the pipe**, using plastic pipe cleaner made for the purpose, after cut edges of material are deburred with medium-grit abrasive. Just buff off burrs; don’t dig into the plastic.

- 5** With a fairly narrow clean paintbrush, apply the adhesive to the inside of the fitting and the outside of the pipe. A “medium” coating is plenty. Don’t skimp on adhesive, but don’t slop it on the parts, either.
- 6** Assemble the pipe and fittings, using the China marker lines for alignment. Once the pipe is in the fitting, twist the pipe or fitting slightly—about 1/4-inch, or so to “spread” the adhesive. You can offset the China marker lines slightly when you put the pipe in the fitting and then twist either to align the lines.
- Once the pipe/fittings are together, you can’t pull them apart. That’s why it is so important that your measurements are accurate and the reason for the “dry run.” If you have made a mistake, the only way to correct it is to cut out a piece of the run and recouple it with a straight fitting or add more pipe to two fittings.



**Brush on adhesive**, or “solvent,” with a fairly wide and clean paintbrush. Coat both pipe and inside of the fitting. The pipe fits tight against a shoulder in fitting, unless it’s “straight” coupling.



**Join pipe/fitting** immediately after both have been coated with solvent. Slightly “twist” pipe (or the fitting) together, using a China marker line for right alignment. Once together, the parts are “welded”

If you find yourself in this situation, mark and cut the pipe between the new marks to the measurement of a slip coupling. Slip the coupling onto the pipe, leaving about 2-inches of the pipe ends exposed for the cement. Heavily coat the pipe with adhesive and slip on the coupling. Then slide the coupling into position.

## PROJECT DATA/BACKGROUND

Since we don’t know what DWV project you will undertake, we can’t give you specific DWV design and detail information. However, on the next pages you will find several typical projects involving DWV products. Hopefully, you can use this data to help plan and construct your project.

As background, explore the Plumbing Department of a home center, looking and handling the various DWV products on display. By doing so, we think that you’ll become better acquainted with these products, and, therefore, see how they can be adapted to specific projects that you have planned for your home.

When figuring pipe size remember that pipes too small can’t carry the drainage load. Pipes too large will tend to clog. “Average” drainage pipe sizes are:

**Toilet: 3 inch pipes.**

**Bathtubs: 2 inch pipes.**

**Kitchen sinks: 1 1/2-inch pipes.**

**Lavatory: 1 1/2-inch pipes.**

**Floor drains: 1 1/2-inch pipes.**

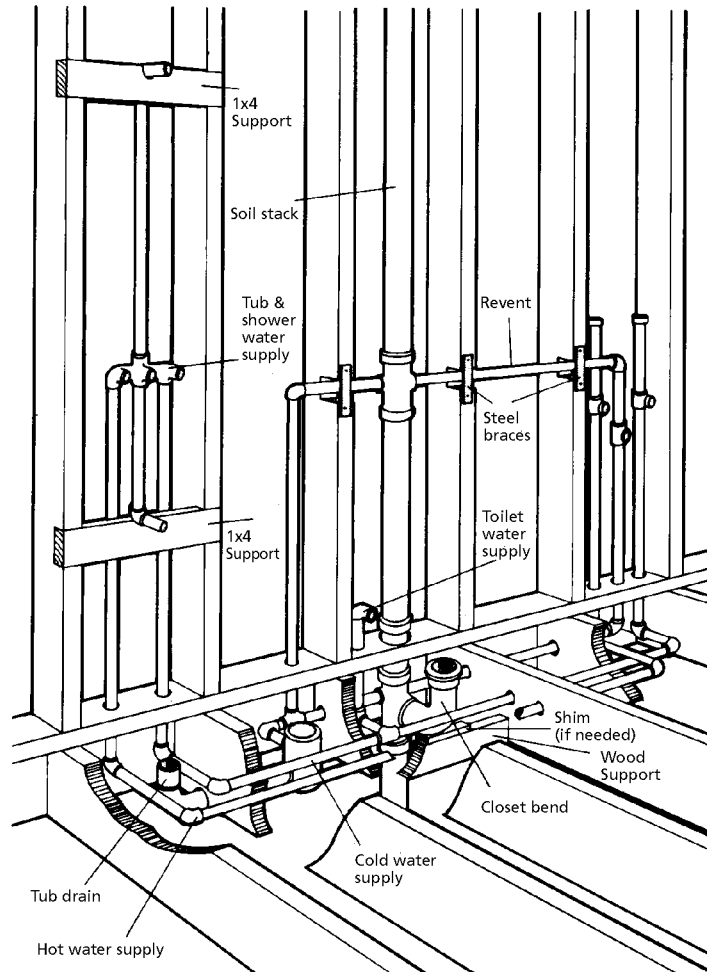
**Laundry drains: 1 1/2-inch pipes.**

**Soil pipe: 3 inch pipes.**

**Sanitary tees: 3 inch pipes.**

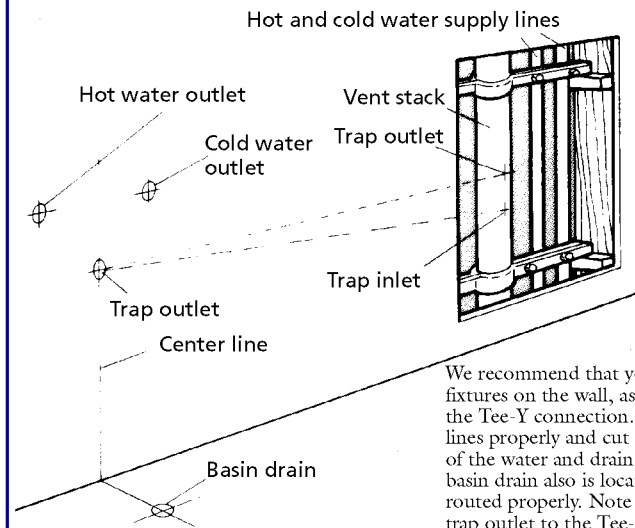
**Vent stacks: 3 inch pipes.**

Be sure to check local plumbing codes concerning sizes. The list above must be considered “average.”



## DWV Rough-In Plumbing For New Bathroom Addition; Tips For Bathroom Redo

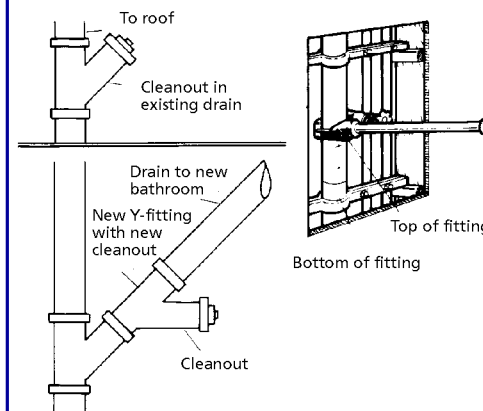
Here is a typical bathroom layout using plastic DWV products. Note that the soil stack, or vent, is hooked to a "revent" system. Venting and reventing allow atmospheric pressure to enter the drain and prevent partial vacuum that could cause slow drainage, or even a backup of one drain into another drain. The big pipes are routed under the floor joists; the water supply system goes through holes bored into the framing members, although these pipes also can go below the framing if you have room. If you are changing existing plumbing, you will have to open up an existing wall(s) to add the larger pipes for the drains. Drains from the bathtub and lavatory can be connected to a main drain below a toilet, rather than running them back to the main house drain. If you will connect to existing plumbing (copper, steel, cast iron) you can buy adapters in plastic to make these connections.



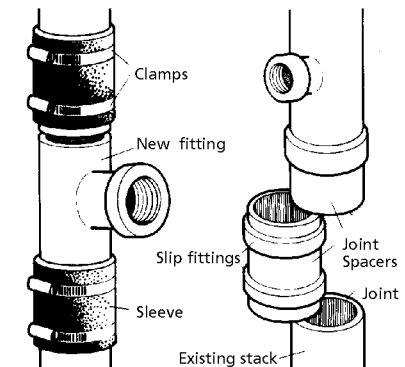
## Routing Plumbing Runs To Hook-Up To Existing DWV Cast Iron Piping

Installing a new lavatory using the existing DWV system is a popular project. Part of the wall through which the DWV system runs has to be opened so the proper connections can be made.

We recommend that you "sketch" out the locations of the fixtures on the wall, as illustrated, which will help you make the Tee-Y connection. The sketch also will help you route all lines properly and cut them to length. First mark the locations of the water and drain lines on the wall. The position of the basin drain also is located on the floor so that piping can be routed properly. Note that the pipe will slope from the new trap outlet to the Tee-Y inlet. Allow 1/4" per foot of horizontal run.



**Fit Y fitting** to permit connection of a new drain where there is a cleanout in main drain in basement or crawl space. A cutter for cast-iron drain line may be rented. For copper, use a large pipe cutter.



**You can remove** a section of cast iron stack. Use rubber sleeves to cover joints at old pipe and new fittings. In a copper or plastic stack, use 2 spacers. Slide fitting from lower spacer on joints.