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Pipe and Materials Spec Reference

What the standards on a utility plan actually mean: which specification governs which pipe, what SDR and class numbers are measuring, and where the installation practice is written down.

Who it is for. Anybody who has quoted a pipe, had the inspector reject it, and discovered that the plan and the specification were calling for two different things.

What this sheet does and does not do

This tells you which standard a designation refers to and what that standard governs. It does not tell you what to install on your job. The plans, the specification, the local authority and your permit do that.

Where two documents disagree, your contract has an order of precedence clause that says which one wins. Find it. If the specification says SDR 26 and the detail says SDR 35, that is a question in writing before the bid, not a decision you make on the truck.

ASTM and AWWA standards are copyrighted and sold. The links below go to the publisher's page for each one, where you can see the scope and the current edition number without buying it.

Gravity sewer and storm pipe

MATERIAL	GOVERNING STANDARD	WHAT THE STANDARD COVERS
PVC gravity sewer, 4 in. to 15 in.	ASTM D3034	Pipe and fittings in SDR 35, SDR 26 and heavier walls, with joint and stiffness requirements
PVC gravity sewer, 18 in. to 60 in.	ASTM F679	Large diameter PVC gravity sewer pipe and fittings
Corrugated HDPE storm, 12 in. to 60 in.	ASTM F2306	Annular corrugated profile wall polyethylene pipe with an interior liner, for non-pressure gravity storm and subsurface drainage
Reinforced concrete pipe	ASTM C76	Culvert, storm drain and sewer pipe in Classes I through V. The class is a strength rating, not a diameter
Installation of thermoplastic gravity pipe	ASTM D2321	Trench width, foundation, bedding, haunching, initial backfill and compaction. This is the one that gets skipped

Pressure pipe

MATERIAL	GOVERNING STANDARD	WHAT THE STANDARD COVERS
PVC pressure pipe, SDR series	ASTM D2241	Pressure rated PVC pipe by SDR. A different specification from gravity sewer pipe
PVC water main	AWWA C900	Pressure pipe and fittings for water distribution, in pressure classes
Ductile iron water main	AWWA C151	Ductile iron pipe, centrifugally cast

Pressure pipe and gravity pipe are not interchangeable in either direction, and a gravity pipe sitting in a pressure application is a failure waiting for a hot day.

SDR, Schedule and Class are three different systems

SDR is Standard Dimension Ratio: the outside diameter divided by the minimum wall thickness. A lower SDR number means a thicker wall relative to the pipe size, so SDR 26 is heavier than SDR 35. It is a ratio, which is why the same SDR holds across diameters.

Schedule 40 and Schedule 80 come from the old iron pipe size system and describe a wall thickness that changes with diameter. Schedule pipe and SDR pipe are dimensioned on different logic and a Schedule number is not a grade of SDR pipe.

In the field people say schedule 35 and schedule 20 when they mean SDR 35 and the lighter walled sewer pipe. Everybody knows what is meant. Write the ASTM designation on your quote anyway, because at delivery the argument is about what the paperwork said, not what everybody meant.

Testing and acceptance, which is where the money goes

TEST	WHAT IT PROVES	WHERE IT IS SPECIFIED
Low pressure air test	The joints hold	Usually the utility specification, division 33
Mandrel or deflection test	The pipe has not deflected beyond the allowable, normally five percent	Utility specification, tested after the backfill has settled
Video inspection	Line, grade, sags and joint condition	Utility specification and the owner's acceptance requirements
Compaction testing	Backfill meets the specified density	Earthwork specification, division 31
Pressure and disinfection test	Water main holds pressure and is fit to commission	AWWA standards and the local water authority

Find out before you bid who hires the testing lab, who pays for a failed test, and who pays for the retest and the excavation to fix whatever failed. On a bad contract all three are yours.

Bedding and backfill are part of the pipe specification

A flexible pipe gets a large part of its strength from the soil around it. That is why ASTM D2321 spends most of its length on the trench rather than the pipe: foundation, bedding, haunching, initial backfill and the compaction of each.

Haunching is the zone under the springline that almost nobody compacts properly, and it is the single most common cause of deflection failures on plastic pipe. It is also a cost, in material and in time, and it belongs on your bid sheet as its own line rather than hidden inside the pipe price.

Concrete pipe behaves differently: it is a rigid pipe and the class rating, the bedding class and the depth of cover work together. The class specified on the plan assumes a bedding class. Changing the bedding changes what class you need.

Septic and onsite wastewater is its own code, and it is local

Onsite wastewater is governed by state and often county rules rather than by the utility specification, and the setbacks, materials and inspection regime are written into that rule. In Missouri the minimum construction standards are 19 CSR 20-3.060, published by the Secretary of State and free to read.

Where a county health department has adopted stricter local standards, the local ones apply. If you work across county lines, the answer to what is allowed genuinely changes from one job to the next, and the only safe habit is to check the county before you quote rather than after.

Where this comes from

Every code, standard and statute this sheet leans on. Check them.

ASTM D3034, PVC sewer pipe and fittings

<https://store.astm.org/d3034-24.html>

4 in. to 15 in. gravity sewer PVC, the SDR 35 and SDR 26 pipe.

ASTM F679, large diameter PVC gravity sewer pipe

<https://store.astm.org/standards/f679>

18 in. through 60 in.

ASTM F2306, corrugated profile wall polyethylene pipe

https://store.astm.org/f2306_f2306m-21.html

12 in. to 60 in. HDPE storm and subsurface drainage.

ASTM C76, reinforced concrete culvert, storm drain and sewer pipe

<https://store.astm.org/standards/c76>

Classes I through V. The class is a strength rating, not a size.

ASTM D2321, underground installation of thermoplastic pipe

<https://store.astm.org/standards/d2321>

The installation practice: bedding, haunching, backfill and compaction.

ASTM D2241, PVC pressure-rated pipe (SDR series)

<https://store.astm.org/d2241-20.html>

Pressure pipe, a different specification from gravity sewer pipe.

American Water Works Association standards

<https://www.awwa.org/>

C900 PVC and C151 ductile iron are the common water main specifications.

19 CSR 20-3.060, Minimum construction standards for onsite wastewater treatment systems

<https://www.sos.mo.gov/cmsimages/adrules/csr/current/19csr/19c20-3.pdf>

Missouri septic rules, published by the Secretary of State. Setbacks start on page 1 of the rule.

Not tied to one module. Applies at any stage of a job.

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<https://dirtworkbusiness.com/library/pipe-materials-spec-reference>