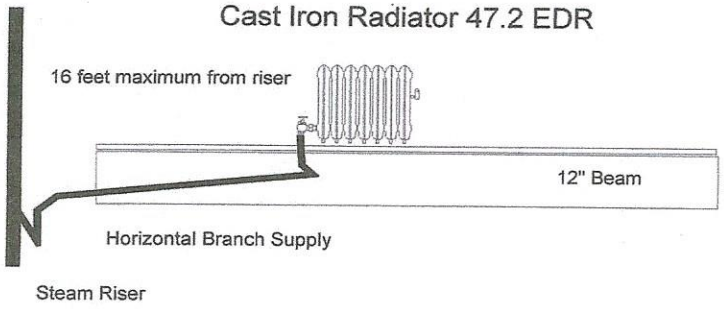
Drawing # 1 shows a cast-iron radiator installation with 1¼-inch pipe

Cast Iron Radiator with total legnth of run of pipe including frictional losses.

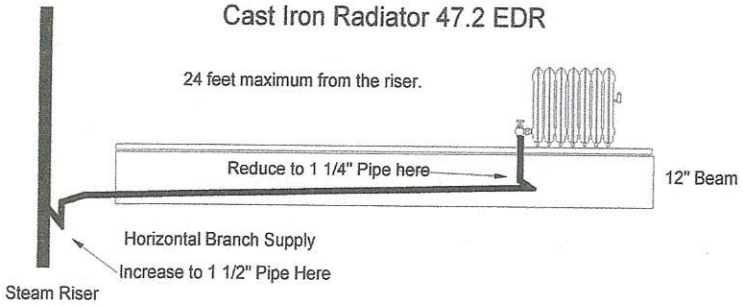


Pitch of the horizontal run of pipe is limited by the height of the beam.

1. One 1/1/4" elbow is equal to 3 feet of pipe. 5 elbows = 15 feet of pipe.
2. 15 feet of pipe at 1/4" pitch need nearly 4" of of pitch.
3. The pipe and fittings use up 4" of the vertical space of the beam.
4. 5 elbows = 15 feet of pipe and use 4" of space for pitch. The pipe and fittings use up another 2" availible space for pitch. With a 12 " beam only 4" is left for pipe pitch. The remaining space is needed for pipe movement.
5. At a 1/4" pitch 4" of additional slope allows 16 feet of pipe to be installed.
6. The maximum legnth of pipe to be installed is 16 feet.

Drawing # 2 shows a cast-iron radiator installed with 1½-inch pipe

Cast Iron Radiator with total legnth of run of pipe including frictional losses.



Pitch of the horizontal run of pipe is limited by the height of the beam.

1. One 1 1/2" elbow is equal to 3.5 of feet of pipe. 5 elbows = 16.5 feet of pipe.
2. 16.5 feet of pipe at 1/4" pitch needs nearly 4.25" of of pitch.
3. The pipe and fittings use up 3.5" of the vertical space of the beam.
4. 5 elbows = 16.5 feet of pipe and use 4.5" of space for pitch. The pipe and fittings use up another 3.5" availible space for pitch. With a 12 Beam only 3 1/4" is left for pipe pitch.
   The Remaining Space is Needed for Pipe Movement . Threfore if 1 1/2" pipe was used to supply 79 EDR, the legnth of pipe drops to 13 feet.
5. At a 1/4" per foot pitch an 1 1/2 pipe can carry 79 EDR. The 1 1/4" pipe carries 47.2 EDR steam.
6. The 1 1/2" pipe is nearly double the capacity of the 1 1/4" pipe based on the capacity it would be safe to run the 1 1/2" pipe 1 1/2 times the permisible distance.
7. Therefore the maximum distance of the 1 1/2" pipe is 24 feet.

Based on the charts and calculations and what is shown in the drawings, increasing the pipe size of lateral runs to a radiator will permit the radiator to be moved further away from the riser.

TABLE 5

STEAM PIPE CAPACITIES FOR LOW PRESSURE SYSTEMS

(For Use on One-Pipe Systems or Two-Pipe Systems in which Condensate Flows Against the Steam Flow)

NOMINAL	CAPACITY IN SQUARE FEET EDR				
	TWO-PIPE SYSTEMS		ONE-PIPE SYSTEMS		
	Condensate Flowing Against Steam		Supply Risers Up-feed	Radiator Valves & Vertical Connections	Radiator and Riser Horizontal Runouts
	VERTICAL	HORIZONTAL			
A	B	Cc	Db	E	Fc
¾	32	28	24	....	28
1	56	56	44	28	28
1¼	124	108	80	64	64
1½	192	168	152	92	64
2	388	362	288	168	92
2½	636	528	464	....	168
3	1128	800	800	....	260
3½	1548	1152	1144	....	476
4	2044	1700	1520	....	744
5	4200	3152	....	....	1112
6	7200	5600	....	....	2180
8	15000	12000	....	....	....
10	28000	22800	....	....	....
12	46000	38000	....	....	....

NOTES:

a—Do not use Col. B for pressure drops of less than 1 oz./100 ft. of equivalent length of run. Use Table 3 instead.

b—Do not use Col. D for pressure drops less than ⅔ oz./100 ft. of equivalent length of run except for pipe size 3" and over. Use Table 3 instead.

c—Pitch of horizontal runouts to risers and radiators should not be less than ½ inch per ft. Where this pitch cannot be obtained, for runouts 8 ft. in length or over, increase one pipe size larger than shown in this table.

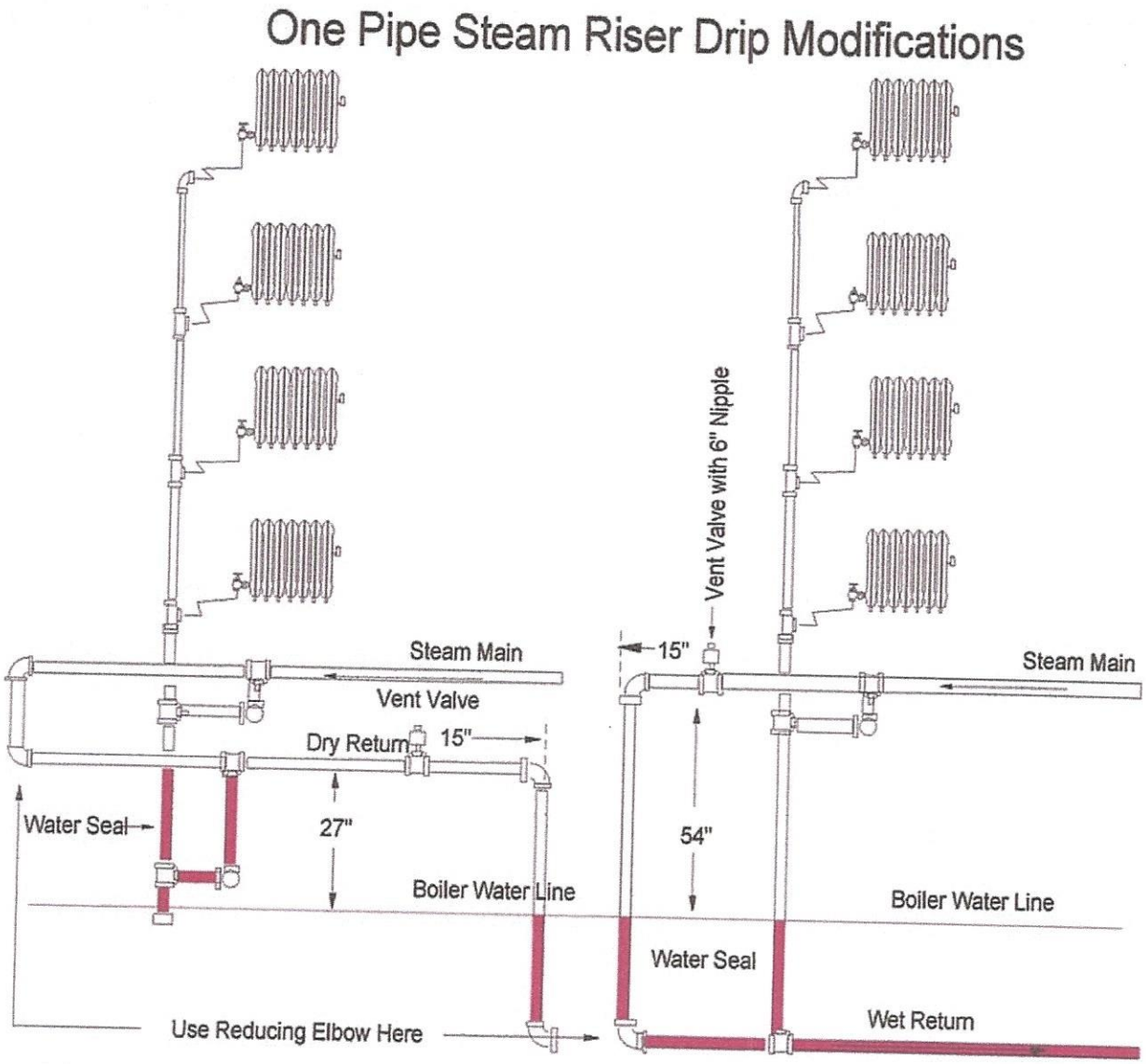
Charts and tables are used to determine steam capacity for piping. Problems can occur when we use a chart that is inappropriate or when we interpret the data for an application. This is the reality. Table 5 gives EDR carry capacities for pipe sizes ¾ through 12 inches. Look at Column F, Radiator and Horizontal Run-outs.

Look at Note C: The pitch of the pipe, for horizontal run-outs, should not be less than ½ inch per foot. Where this pitch cannot be obtained for run-outs, 8 feet in length or more, increase the horizontal pipe one-pipe size larger than what is shown on this table.

Our dilemma is how far a radiator can be installed from the riser. Note C: A 47.2 EDR radiator, if installed more than 8 feet from the riser, needs a 1½-inch supply run-out. As stated before, the

1½-inch pipe is nearly double the capacity of the 1¼-inch pipe, so we can safely extend the distance to 12 feet. When using the proper tables, correcting problems associated with horizontal run-out extensions to radiators or moving radiators are less problematic.

All piping layouts, solutions and correction of problems that occur due to a dropped steam riser, adding new radiators to a building extension, or installing a new boiler require a proper dimension "A."



Two radiator risers are shown in the drawing above. Each riser is equipped with relief drip piping. One riser is connected to a dry return and the other a wet return. At the left riser, the riser's relief drip connects to the dry return via a water seal. The water seal separates the riser from the dry return and allows the condensate from the radiators to drain and bypass the steam main. Condensate drains directly into the dry return, and the water seal prevents steam in the dry return from entering the return riser and interfering with condensate drainage. The other riser drip is connected to a wet return.