

CAST IRON SOVENT® DESIGN MANUAL #802 KWIK-REFERENCE GUIDE

BASIC WRITTEN RULES



As published by

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Welcome to the Kwik-Reference electronic version of the Cast Iron Sovent® Design Manual #802 basic written rules for design, installation and inspection. The information presented herein correlates directly with the complete printed volume catalog currently distributed by our office. For illustrated interpretation of these rules please consult the complete version of this manual. Contact our office with any questions regarding this reference guide.

TABLE OF CONTENTS

AERATOR AND STACK RULES	Page 2
DE-AERATOR AND BUILDING DRAIN RULES.....	Page 3
BRANCH RULES.....	Page 4

CAST IRON SOVENT® DESIGN MANUAL #802 – Version E802.04

SOVENT® AERATOR AND STACK RULES

- (A) The stack size shall be in accordance with Table B based on the total fixture unit load determined by Table A or A-1.
- (B) The stack shall not telescope or decrease in size and must be continued full size through the roof.
(Drawing No. 1)
- (C) An Aerator fitting is required at each level where the following horizontal branches enter the stack:
 - (1) Any soil branch
 - (2) A waste branch the same size as the stack size
 - (3) A waste branch one pipe size smaller than the stack size(Drawing No. 2)
- (D) The Aerator fitting shall be placed in a vertical plane. Tilting the Aerator to offset the Sovent® stack is not permitted.
- (E) At any level where an Aerator is not required, an “in-line” offset consisting of two one-eighth bends and one quarter bend may be used. The vertical distance between Aerators or “in-line” offsets shall not exceed twenty feet (20'-0”). No more than two consecutive “in-line” offsets are permitted.
(Drawing No. 3)
- (F) Waste branches two pipe sizes smaller than the stack size may connect directly to the stack through a sanitary fitting.
(Drawing No. 4)
- (G) Horizontal stack offsets exceeding sixty degrees (60°) from vertical require a De-aerator fitting and Pressure Relief Line (PRL). The Pressure Relief Line (PRL) shall connect to the vertical portion of the stack downstream of the offset. Soil and waste branches may connect to the horizontal portion of the offset. These connections shall be made BETWEEN the two vertical portions of the stack at a minimum distance of ten pipe diameters (based on stack size) downstream of the higher vertical stack. Branch connections to a horizontal stack offset less than ten pipe diameters in length shall be made as far downstream on the horizontal as possible. Soil and waste branches shall not connect where the offset makes a horizontal change of direction. Waste branches may connect to the horizontal portion of the Pressure Relief Line (PRL), except on office building battery type installations. Waste branches shall be at least one pipe size smaller than the PRL. Waste branch connections shall not be made into any vertical portion of the PRL. Clothes washers shall not connect to the PRL. Horizontal stack offsets shall be sized per Table C based on the total fixture unit load of all fixtures connecting to the offset and fixtures upstream. The entire stack size shall be no smaller than the largest horizontal offset size.
(Drawing No. 5)
- (H) Sovent® stacks may be combined before entry into the main sewer drain. The stacks shall combine downstream of each Pressure Relief Line (PRL) termination point. The total fixture unit load of the combined stacks determines collection drain line sizing.
(Drawing No. 6)
- (I) Stack vent headers above the highest fixture may offset prior to the vent thru roof penetration (VTR). The horizontal vent header and VTR shall be increased one pipe size when exceeding twenty feet (20'-0”) in horizontal length.
(Drawing No. 7)
- (J) Stack vent headers above the highest fixture may be combined prior to the vent thru roof penetration (VTR) with one vertical stack extending through the roof. The one combined vertical stack shall be one pipe size larger than the largest of the combined stacks. If the distance between any stack and the VTR exceeds twenty feet (20'-0”), the horizontal offset shall be increased one (1) pipe size larger than the downstream stack.
(Drawing No. 7)

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SOVENT® DE-AERATOR AND BUILDING DRAIN RULES

- (A) A De-aerator fitting is required at the base of each stack. The De-aerator fitting shall be installed in the vertical portion of the stack. The distance between the De-aerator fitting and the Sovent® building drain shall not exceed five feet (5'-0"). The Sovent® building drain size shall be in accordance with Table C based on the total fixture unit load determined by Table A or A-1. The transition to a larger Sovent® building drain size shall be made in the vertical stack below the De-aerator fitting, except as noted in paragraph "I".
(Drawing No. 8)
- (B) The De-aerator fitting uses a Pressure Relief Line (PRL). The Pressure Relief Line (PRL) connects to the Sovent® building drain a MINIMUM distance of ten pipe diameters (based on stack size) downstream from the centerline of the stack. The PRL connects to the Sovent® building drain above the centerline of the drain. The PRL may be rolled to the side providing the bottom of the PRL is above the centerline of the Sovent® building drain.
(Drawing No. 9)
- (C) The installed slope for the Sovent® building drain and PRL is recommended to be one-quarter inch per foot (2%). Installed slopes of one-eighth inch per foot (1%) are permitted however pipe capacity is reduced by a factor of 0.8 as shown in Table C. Installed slopes less than one-eighth inch per foot (1%) are strictly prohibited.
- (D) Soil and waste branches may connect to the Sovent® building drain BETWEEN the centerline of the stack and the termination point of the Pressure Relief Line (PRL). All connections shall be made a MINIMUM distance of ten pipe diameters (based on stack size) downstream from the centerline of the stack. Soil and waste branches shall not connect where the Sovent® building drain makes a horizontal change of direction.
(Drawing No. 10)
- (E) Waste branches may connect to the horizontal portion of the Pressure Relief Line (PRL), except on battery type installations. Waste branches shall be at least one pipe size smaller than the PRL. Waste branch connections shall not be made into any vertical portion of the PRL. Clothes washers shall not connect to the PRL.
(Drawing No. 11)
- (F) Soil and waste branches may connect downstream of the PRL termination point providing conventional plumbing rules are applied. The vent header from these fixtures may connect to the vertical portion of a Sovent® stack below an Aerator fitting through a sanitary tee installed with the flow radius down. The vent load of these fixtures shall be added to the fixture unit load on the Sovent® stack.
(Drawing No. 13)
- (G) Soil and waste branches may connect to the vertical stack below the De-aerator fitting. These connections shall be made through a wye-type fitting or through an Aerator fitting. Entry to the Sovent® building drain from the stack shall be made using a short sweep, long sweep, two one-eighth bends, or a combination wye & one-eighth bend fitting.
(Drawing No. 14)
- (H) Fixtures considered too remote from the Sovent stack may be plumbed by conventional methods. This waste and vent area shall be sized in accordance with local prevailing ordinances.
(Drawings No. 12 & No. 15)
- (I) Office building battery type installations and Sovent® stacks serving clothes washers shall use a De-aerator fitting equal in size to the Sovent® building drain serving that stack. A four-inch (4") De-aerator fitting will be required on three-inch (3") Sovent® stacks.

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SOVENT® BRANCH RULES

- (A) The maximum developed length of a three-inch (3") soil branch shall not exceed twelve feet (12'-0"). The maximum developed length of a four-inch (4") soil branch shall not exceed twenty-seven feet (27'-0"). Developed lengths are measured along the centerline of all horizontal branch piping located in ceiling and wall areas. Vertical drops from trap arms or fixtures are not included in the developed length calculations.
(Drawing No. 16)
- (B) The maximum developed length of a two-inch (2") waste branch shall not exceed fifteen feet (15'-0"). The maximum developed length of a three-inch (3") waste branch shall not exceed fifteen feet (15'-0"). Developed lengths are measured along the centerline of all horizontal branch piping located in ceiling and wall areas. Vertical drops from trap arms or fixtures are not included in the developed length calculations. Waste branches two pipe sizes smaller than the stack size may connect directly to the stack through a sanitary fitting.
(Drawing No. 17)
- (C) Branch sizing shall be in accordance with Table D based on the total fixture unit load determined by Table A or A-1. The installed slope for horizontal branches is recommended to be one-quarter inch per foot (2%). Installed slopes of one-eighth inch per foot (1%) are permitted however pipe capacity is reduced by a factor of 0.8 as shown in Table D. Installed slopes less than one-eighth inch per foot (1%) are strictly prohibited.
- (D) Branches having three ninety degree (90°) horizontal changes of direction shall be increased one pipe size at the third ninety degree (90°) change of direction nearest the stack. This increase is not required if one of the directional changes can be made with two one-eighth bends or a short sweep radius bend.
(Drawing No. 18)
- (E) The transition from a horizontal or vertical branch to another horizontal branch must be made with a wye-type fitting.
(Drawing No. 18)
- (F) Horizontal branch piping at the base of a vertical drop exceeding forty inches (40") in height shall be increased one pipe size. This increase is not required when the lower portion of the drop is made at forty-five degrees (45°) and the upper vertical portion is less than forty inches (40").
(Drawing No. 19)
- (G) Branch piping with vertical drops exceeding ten feet (10'-0") shall be increased one pipe size.
(Drawing No. 19)
- (H) A three-inch (3") soil branch shall be increased one pipe size at the connection point of other fixtures. This increase is not required when computing fixture unit loads from Table A-1.
- (I) Two fixtures using 1-1/4" tailpiece/trap sizes may combine into a single two-inch (2") vertical drop. Fixtures using 1-1/2" tailpiece/trap sizes and larger require separate vertical drops from each trap arm or may combine into a single vertical drop that is increased one pipe size. This increase is not required if the change in elevation is made at forty-five degrees (45°). The fixture trap arm shall be one pipe size larger than the fixture tailpiece and this increase may be made at the wall.
(Drawing No. 20)
- (J) Clothes washer branches shall be three-inch (3") in size. Clothes washer branches with no vertical drops and developed lengths five feet (5'-0") or less may be two-inch (2") in size.
(Drawing No. 20)
- (K) Pressure Equalizing Lines may be used as an alternate to the rules concerning increased branch sizes. Pressure Equalizing Lines shall rise vertically above the branch and connect to the Sovent stack above the flood rim of the fixtures they serve. Pressure Equalizing Lines may be led directly through the roof.

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