

8 Prevent Sewage Backflow

I. Summary

Issue:

During floods, sewage can backflow into buildings.

Recommendation:

Require valves on building sewage lines to prevent sewage from entering the building.

II. Proposed Legislation, Rule or Study

Amendments to the New York City Plumbing Code:

1. Add a new Subsection 715.1.1 as follows:

715.1.1 – Building drains serving buildings located in Special Flood Hazard Areas shall be provided with a backwater valve at its point of exit from the building and downstream from the building trap.

2. Add a new Subsection 1002.6.1 as follows:

1002.6.1 – Backwater valves shall be provided on the building storm drainage system in accordance with PC 715 for all buildings located in Special Flood Hazard Areas.

III. Supporting Information

Expanded Issue and Benefits:

The use of backwater valves can help minimize damage to below-grade levels during a flood event. Floodwater from either coastal or surface flooding will be prevented from entering the building through the sewer, bringing potentially toxic and hazardous materials inside.

Backwater valves do not prevent building discharges from exiting the building, as they are only in the “closed” position when the sewers are full and threaten to backflow into the building. These periods are generally brief and, in any case, no building sewage can be discharged into the sewers when the sewers are full, regardless of the presence of backwater valves.

Cost:

The cost associated with this proposal includes installation of backwater valves on each storm point of entry. Backwater valves are already required by the Plumbing Code for buildings subject to overflow from the public sewers. As a result, in most cases this proposal merely clarifies the location of the valve and does not represent an additional cost.

There may be additional maintenance requirements associated with backwater valves. Backwater valves of the hinged flap type can become hung up and not work when needed, a problem increased in the absence of proper maintenance. As a result, the NYC School Construction Authority specifies the use of floodgate valves to avoid this issue.

This provision should be easy to implement, as the technology and means are readily available and well understood.

Turner Construction Company prepared cost estimates based upon several standardized building typologies. Due to the innate variances in construction costs between projects, the complexity of the Task Force proposals, and the wide range of buildings to which the proposals may apply, these cost estimations should only be used as rough order-of-magnitude guides. The cost analysis is presented at the end of this proposal; more information about the cost methodology is given at the end of the full report.

Sources:

1. NYCPC Chapters 7, 10, & 11.

8 PREVENT SEWAGE BACKFLOW

NEW CONSTRUCTION												
	Commercial High Rise			Commercial Low Rise			Residential High Rise			Residential Low Rise		
	Quantity	Unit	Total Unit Cost	Quantity	Unit	Total Unit Cost	Quantity	Unit	Total Unit Cost	Quantity	Unit	Total Unit Cost
8 Prevent Sewage Backflow												
Architectural revisions			\$0			\$0						\$0
Furnish and install backwater valve	1	ALW	\$10,000.00	1	ALW	\$5,000.00	1	ALW	\$10,000.00	1	ALW	\$5,000.00
Relocate pipe and fresh air intake above the design flood elevation	100	LF	\$150,000	100	LF	\$150,000	100	LF	\$150,000	100	LF	\$150,000
Wire mesh screen and fresh air intake	1	ALW	\$1,500.00	1	ALW	\$1,500.00	1	ALW	\$1,500.00	1	ALW	\$1,500.00
Demolition			Not Required			Not Required			Not Required			Not Required
			\$0			\$0			\$0			\$0
SUBTOTAL DIRECT WORK			\$26,500			\$21,500			\$26,500			\$21,500
Contingency						\$2,650						\$2,150
SUBTOTAL			\$29,150			\$23,650			\$29,150			\$23,650
GC Mark-ups						\$5,830						\$4,730
TOTAL	620,000	GSF	\$0.06	4,000	GSF	\$7.10	231,000	GSF	\$0.15	15,000	GSF	\$1.89
			\$34,980			\$28,380			\$34,980			\$28,380

EXISTING BUILDINGS												
	Commercial High Rise			Commercial Low Rise			Residential High Rise			Residential Low Rise		
	Quantity	Unit	Total Unit Cost	Quantity	Unit	Total Unit Cost	Quantity	Unit	Total Unit Cost	Quantity	Unit	Total Unit Cost
8 Prevent Sewage Backflow												
Architectural revisions			\$0			\$0						\$0
Furnish and install backwater valve	1	EA	\$10,000.00	1	ALW	\$5,000.00	1	EA	\$10,000.00	1	ALW	\$5,000.00
Relocate pipe and fresh air intake above the design flood elevation	100	LF	\$150,000	100	LF	\$150,000	100	LF	\$150,000	100	LF	\$150,000
Wire mesh screen on fresh air intake	1	ALW	\$1,500	1	ALW	\$1,500	1	ALW	\$1,500	1	ALW	\$1,500
Demolition of existing conditions	1	ALW	\$7,200.00	1	ALW	\$3,000.00	1	ALW	\$7,200.00	1	ALW	\$3,000.00
			\$0			\$0			\$0			\$0
SUBTOTAL DIRECT WORK			\$33,700			\$24,500			\$33,700			\$24,500
Contingency						\$2,450						\$2,450
SUBTOTAL			\$37,070			\$26,950			\$37,070			\$26,950
GC Mark-ups						\$7,414						\$5,390
Individual Proposal Total	620,000	GSF	\$0.07	4,000	GSF	\$8.09	231,000	GSF	\$0.19	15,000	GSF	\$2.16
			\$44,484			\$32,340			\$44,484			\$32,340