

Chapter H 62

Private document

**DESIGN, CONSTRUCTION, INSTALLATION,
SUPERVISION, AND INSPECTION
OF PLUMBING**

H 62.01	Basic plumbing principles	H 62.15	Materials
H 62.02	Definitions	H 62.16	Joints and connections
H 62.03	Fixture unit design basis	H 62.17	Repairs and reconstruction
H 62.04	Building sewers	H 62.18	Water supply systems
H 62.05	Building drains	H 62.19	Back siphonage and cross connections
H 62.06	Stacks and branches	H 62.20	Sewage treatment and disposal systems
H 62.07	Vents	H 62.21	Inspection and tests
H 62.08	Traps	H 62.22	Sketches
H 62.09	Cleanouts	H 62.23	Approval on experimental basis
H 62.10	Floor drains	H 62.24	Industrial commission regulations
H 62.11	Catch basin, sumps, ejectors		
H 62.12	Fixtures		
H 62.13	Rain water connections		
H 62.14	Special requirements		

H 62.01 Basic plumbing principles. (1) All premises intended for human occupation or occupancy shall be provided with a supply of pure and wholesome water; such supply shall not be cross connected with an unsafe water supply nor with a waste pipe.

(2) Buildings in which water closets and other plumbing fixtures exist shall be provided with a supply of water adequate in volume and pressure for flushing purposes.

(3) The pipes conveying water to water closets shall be of sufficient size to supply the water at a rate required for adequate flushing without unduly reducing the pressure at other fixtures.

(4) Devices for heating water and storing it in "boilers", or hot water tanks, shall be so designed and installed as to prevent all dangers of explosion, and also prevent backflow of hot water through a meter connected with a public water supply.

(5) Every building intended for human habitation or occupancy on premises abutting on a street in which there is a public sewer shall have a connection with the sewer.

(6) In multiple dwellings provided with a house drainage system, there shall be at least one private water closet for each family.

(7) Plumbing fixtures shall be made of smooth nonabsorbent material, shall be free from concealed fouling surfaces, and shall be set free of inclosures.

(8) The entire house drainage system shall be so designed, constructed, and maintained as to conduct the waste water or sewage quickly from the fixture to the place of disposal, with velocities which will prevent clogging, fouling and the depositing of solids.

(9) The drainage pipes shall be so designed and constructed as to be proof for a reasonable life of the building against leakage of water or drain air due to defective materials, imperfect connections, corrosion, settlements or vibrations of the ground or building, temperature changes, freezing or other causes.

(10) The drainage system shall be provided with an adequate number of cleanouts so arranged that in case of stoppage the pipes may be readily accessible.

(11) Each fixture or combination fixture shall be provided with a separate accessible, self scouring reliable water seal trap placed as near to the fixture as practical.

(12) The house drainage system shall be so designed that there will be an adequate circulation of air in all pipes, no danger of siphonage, aspiration, or forcing of trap seals under conditions of ordinary use.

(13) The soil stack shall extend full size, upward through the roof terminal and have a free opening, the roof terminal being so located that there will be no danger of air passing from it to any window and no danger of clogging of the pipe by frost, or by articles being thrown into it, or of roof water draining into it.

(14) The plumbing system shall be subjected to a water or air pressure test, and to a final air pressure test if necessary, to disclose all leaks and imperfections in the work.

(15) No substances which will clog the pipes, produce explosive mixtures, or destroy the pipes or their joints, shall be allowed to enter the house drainage system.

(16) Refrigerators, ice boxes, or receptacles for storing food shall not be connected directly with the drainage system.

(17) No water-closet or urinal shall be located in a room or compartment which is not properly lighted or ventilated to the outer air.

(18) If water-closets or other plumbing fixtures exist in buildings where there is no sewer within a reasonable distance, suitable provision shall be made for disposing of the house sewage by some method of sewage treatment and disposal satisfactory to the health authority having jurisdiction.

(19) Where a house drainage system may be subjected to backflow of sewage, suitable provisions shall be made to prevent its overflow into the building.

(20) Plumbing systems shall be maintained in a sanitary condition.

H 62.02 Definitions. (1) **PLUMBING** means and includes: (a) All piping, fixtures, appliances and appurtenances in connection with the water supply and drainage systems within a building and to a point from 3 to 5 feet outside of the building.

(b) The construction and connection of any drain or waste pipe carrying domestic sewage from a point within 3 to 5 feet outside of the foundation walls of any building with the sewer service lateral at the curb or other disposal terminal, including private domestic sewage treatment and disposal systems and the alteration of any such system, drain or waste pipe, except minor repairs to faucets, valves, pipes, appliances and removing of stoppages.

(c) The water service piping from a point within 3 to 5 feet outside of the foundation walls of any building to the mains in the street, alley or other terminal and the connecting of domestic hot water storage tanks, water softeners, and water heaters with the water supply system.

(d) The water pressure system other than municipal systems as provided in ch. 144.

(e) A plumbing and drainage system so designed and vent piping so installed as to keep the air within the system in free circulation and movement, and to prevent with a margin of safety unequal air

pressures of such force as might blow, siphon or affect trap seals, or retard the discharge from plumbing fixtures, or permit sewer air to escape into the building.

(2) **ALIGNMENT.** Laid to a straight line, either horizontal, vertical or at a given angle.

(3) **APPROVED** means approval by the local plumbing or building supervisor or state board of health or industrial commission in conformance with the respective laws and regulations governing.

(4) **A.S.T.M.** Abbreviation for American Society for Testing Materials.

(5) **BACKFLOW** is a term which denotes the reversal of flow in a drainage system.

(6) **BASEMENT** means a story whose floor line is below grade at any entrance or exit and whose ceiling is not more than 5 feet above grade at any such entrance or exit. The first floor is the floor next above the basement, or the lowest floor if there is no basement. The number of stories of a building includes all stories except the basement.

(7) **BELL OR HUB.** That portion of a pipe which for a short distance is sufficiently enlarged to receive the end of another pipe of the same diameter for the purpose of making a joint.

(8) **BRANCH.** The branch of any system of piping is that part of the system, which extends laterally at a slight grade, with or without other lateral or vertical extensions, from the stack, building drain or building sub-drain to receive fixture outlets.

(9) **BURR.** Roughness or metal protruding from the walls of a pipe, usually as the result of cutting the pipe.

(10) **CATCH BASIN.** A water-tight receptacle built to arrest the sediment of surface subsoil or other waste drainage, and to retain oily or greasy wastes, to prevent their entrance into the house sewer or drain.

(11) **CLEANOUT.** A metallic plug or cover joined by means of a screw thread to an opening in a pipe, which can be removed for the purpose of cleaning or examining the interior of the pipe.

(12) **CODE.** A compilation of minimum rules and regulations governing the installation of plumbing, drainage and water supply.

(13) **CONDUCTORS, ROOF LEADERS, DOWN SPOUTS.** All pipes located in or outside of buildings, conveying storm or rain water from the roofs of buildings or areas to the storm or yard sewer, basin or rain-water cistern.

(14) **DEAD END** is that part or branch of a drainage system which is without a free circulation of air.

(15) **DRAINAGE DISPOSAL FIELD.** A shallow soil absorption system consisting of open jointed or perforated pipe for disposal of effluent or clear waste.

(16) **EFFLUENT.** Liquid flowing from any treatment tank or device.

(17) **EJECTORS.** An ejector is a device operated either electrically, or by water power or other mechanical means so constructed as to

elevate liquids from a lower level to a point of discharge into a public or private sewer or other final means of disposal.

(18) **FERRULE.** A metallic sleeve, used to connect lead or iron waste, or vent pipe, to a soil pipe hub.

(19) A **FITTING** is a device designed to make connections between pipes.

(20) **FIXTURES.** (a) A *fixture* is a receptacle intended to receive and discharge water, liquids, or water carried wastes into a drainage system.

(b) A *lavatory* or wash basin is a fixture designed for the washing of the hands or face.

(c) A *sink* is a shallow fixture ordinarily with a flat bottom, and usually used in a kitchen, or in connection with the preparation of foods.

(d) *Service sink* is a deeper fixture than a kitchen sink and used for the reception of slops.

(e) A *tray* is a fixture used in a laundry for washing; sometimes called a laundry tub.

(21) **FIXTURE UNIT** is any fixture or equivalent that discharges intermittently at the rate of 7.5 gallons per minute (one cubic foot per minute).

(22) **FREE CIRCULATION** of air means a plumbing and drainage system so designed and installed as to keep the air within the system in free circulation and movement, and to prevent with a margin of safety unequal air pressures of such force as might blow, siphon or affect trap seals, or retard the discharge from plumbing fixtures or permit sewer air to escape into the building.

(23) **GARAGES.** A public garage is a building or part of a building having more than 500 square feet in area which accommodates or houses self-propelled land, air or water vehicles.

(24) **HEIGHT OF BUILDING** is measured at the vertical center line of its lowest side from the street grade, or if setting back from street from grade of the ground adjoining the building, to the highest part of a flat roof or to a point two-thirds the height of a gabled or hip roof.

(25) **INDUSTRIAL WASTES.** The liquid wastes resulting from the processes employed in industrial establishments.

(26) **LONG SWEEP $\frac{1}{4}$ BEND.** A bend having the radius of the center line of the bend equal to 7 inches plus one-half the inside diameter of the pipe.

(27) **MANHOLE.** An opening constructed to a sewer or any portion of a plumbing system of sufficient size, to permit a man to gain access thereto.

(28) **PLACE OF EMPLOYMENT.** Every place, whether indoors or out, or underground and the premises appurtenant thereto, where either temporary or permanently any industry, trade or business is carried on, or where any process or operation, directly or indirectly related to any industry, trade or business, is carried on, and where any person

is directly or indirectly employed by another for direct or indirect gain or profit, but shall not include any place where persons are employed in private domestic service or agricultural pursuits, which do not involve the use of mechanical power.

(29) PRIVATE DWELLING is understood in this code to be any building used only for living purposes and occupied by not more than two families.

(30) PRIVY. An outhouse or structure used for the deposition of human excrement.

(31) PRIVY VAULT. A pit beneath a privy in which human excrement collects.

(32) PUBLIC BUILDING. Any structure used in whole or in part as a place of resort, assemblage, lodging, trade, traffic occupancy or use by the public, or by three or more tenants.

(33) REPAIRS AND STOPPAGES. Repairs are defined to consist of fixing leaks and removing of obstructions in soil, waste and supply pipes and to restore defective valves, faucets and similar appliances to an efficient operating condition.

(34) RISER is a water supply pipe which extends vertically one full story or more to convey water to branches or fixtures.

(35) ROUGHING IN is the installation of all soil, waste, vent and water supply pipes within a building.

(36) RURAL OR ISOLATED BUILDINGS are understood in this code to be those situated at such a distance from a public sewer system that their drainage systems cannot become tributary thereto.

(37) SAFING. A pan or other collector placed beneath a pipe or fixture, to prevent leakage from escaping on the floor, ceiling or walls.

(38) SEEPAGE PIT. An underground receptacle with a manhole and cover brought to the surface of the ground for observation and cleaning purposes, so constructed as to insure the disposal of effluent or clear wastes, by soil absorption through its walls and bottom.

(39) SEPTIC TANK is a reservoir or tank which receives crude sewage, and by bacterial action and sedimentation effects a process of clarification and decomposition of solids.

(40) SEWAGE. The water carried wastes created in and to be conducted away from residences, industrial establishments, and public buildings as defined in section 101.01, Wis. Stats., with such surface or ground water as may be present.

(41) SEWERAGE SYSTEM. All structures, conduits and pipe lines by which sewage is collected and disposed of, except plumbing inside and in connection with buildings served, and service pipes from building to street main.

(42) SEWERS. (a) A *combined sewer* is a sewer or drain intended to receive domestic sewage, industrial water-carried wastes, surface, storm and clear water.

(b) *Building or house drain*. The lowest main horizontal piping of a drainage system which receives the discharge of all soil, waste

and other drainage pipes inside any building and conveys the same to the building sewer, 3 to 5 feet outside the foundation wall of such building. The minimum building drain extends from the building sewer to the furthestmost soil stack. 1. Building or house sub-drain. The horizontal portion of a drainage system within a building which cannot flow by gravity to the building or house drain.

(c) *Building or house sewer.* That part of the horizontal piping beginning 3 to 5 feet from the foundation wall to its connection with the main sewer, septic tank, or other disposal terminal.

(d) A *private sewer* is a privately owned sewer.

(e) A *public sewer* is a publicly owned sewer.

(f) A *sanitary sewer* is a sewer or drain constructed to convey organic waste from buildings to a septic or other treatment tank or point of disposal and from which all surface and storm water is excluded.

(g) A *storm drain* is a conduit for carrying off surface, storm and clear waters.

(h) A *subsoil drain* is that part of a drainage system which conveys the ground or seepage water, from the foot of walls or below the cellar floor under buildings to the house or storm drain.

(i) A *yard drain* is that part of a horizontal piping and its branches which convey the surface drainage from areas, courts or yards, outside the walls of a building, to the house drain, house sewer or storm water drain.

(43) **SHALL, SHOULD, AND MAY.** The word "shall" when used in this code is mandatory. "Should" is not mandatory but expresses the recommendation of the board. "May" implies neither compulsion nor recommendation, only permission.

(44) **SIPHONAGE.** (a) *Siphonage* is a suction created by the flow of liquids in pipes.

(b) *Back siphonage* means the formation of a partial vacuum in water supply pipes which cause a sucking back of polluted water or other liquids into the water supply piping.

(45) **SLIP JOINT** is a connection in which one pipe slips into another, the joint of which is made tight with approved gasket or packing.

(46) **SOIL STACK.** Any pipe extending upward which conveys the discharge of water closets with or without other fixtures to the building drain, building sub-drain or underground branch.

(47) **SPECIAL WASTE.** Waste pipes which are not permitted to connect directly to the soil or waste stack, house drain or house sewer.

(48) **SPIGOT** is the end of a pipe or fitting which fits into bell or hub.

(49) **STACK.** The pipe extending upward from the building drain, building sub-drain or underground branch with or without change of direction through the roof or to a connection with another stack.

(50) **SUMP.** A collecting basin installed at the low point of a plumbing system to receive liquid wastes from which they may be ejected or pumped to a gravity sewer or waste pipe.

(51) **TERMINAL** is that part of a drainage or vent system which projects above the roof of the building or at the end of the house drain connecting to the septic tank or house sewer.

(52) **TRAPS.** (a) *Trap* is a fitting constructed to prevent the passage of air or gas through a pipe without materially affecting the flow of sewage or waste water.

(b) The *crown of a trap* is where the trap connects to or becomes a part of the horizontal outlet arm, and any portion of the horizontal outlet arm of the trap which is integral with the trap.

(c) *Deep seal* is a term applied to a trap having a water seal twice the depth of the common trap.

(d) *Depth of trap seal* is indicated by the height of the water column measured between the overflow and the dip separating the inlet and outlet arms of the trap.

(e) A *deep seal resealing trap* of the centrifugal self-scouring type is a trap in which the water motion is both centrifugal and upward at each discharge of the fixture and retains an adequate amount of water to form an efficient trap seal.

(f) A *drum trap* consists of a cylinder with its axis vertical. The cylinder is larger in diameter than the inlet or outlet pipe, it is usually 4 inches in diameter with one and one half or 2 inch inlets and outlets. A trap screw of the same size as the cylinder, accessible for cleaning purposes is provided.

(g) A *sand trap* is a catch basin for the collection of sand or other gritty material.

(53) A **VACUUM** is a pressure less than atmospheric pressure and is referred to sometimes as a suction. It is usually measured by the number of inches of mercury below atmospheric pressure, such as 10 or 20 inches of mercury. A perfect vacuum varies with the barometric pressure but in Wisconsin is equal to about 29 inches of mercury.

(54) **VENTS.** (a) *Vent pipe* is any pipe provided to ventilate a drainage and plumbing system of piping.

(b) *Back vent* is a pipe which connects directly with an individual trap, soil or waste pipe underneath or back of the fixture it serves and connects to the general vent piping system above this fixture with no part of it below the fixture trap.

(c) *Branch vent* is that part of the vent piping which extends horizontal, with or without lateral or vertical extensions, and to which other vent pipes connect.

(d) *Circuit vent* is a connection made by joining a nearly horizontal trap outlet with a soil or waste pipe, and vent pipe in such a manner that a continuous vent is formed.

(e) *Continuous vent* is a vertical vent pipe that is a continuation of the vertical waste pipe to which it connects.

(f) *Loop vent* is similar to a back vent except that part of it extends below the trap it serves before re-connecting to the vent system.

(g) *Main soil or waste vent* is that part of the stack above the highest installed branch or fixture connection.

(h) *Main vent* is a vent pipe extending vertically with or without changes of direction and which acts as a terminal for other vents, and terminates through the roof or connects with the main soil or waste vent at a point 2 feet or more above the highest soil or waste opening, but in no case less than 38 inches above the highest floor on which soil or waste openings are installed.

(i) *Relief vent* is a vent pipe connected close to the stack in a manner to prevent minus and plus pressures in the stack.

(j) *Unit vent* is one which denotes an installation so arranged that one pipe will serve two traps at the same point.

(k) *Wet vent* is that portion of a vent pipe through which liquid wastes flow.

(l) *Yoke vent*. A connection between a vent stack and a soil or waste stack in a manner to prevent minus and plus pressures in the stacks.

(m) *Local or exhaust vent* is a pipe or shaft conveying foul air from plumbing fixtures or rooms to the outside air and not connected to the plumbing system.

(55) **WASTE STACK OR PIPE AND LOCAL WASTE PIPE** is any pipe which receives the discharge of any fixture except water closets. When such pipe does not connect directly with a house drain or soil stack it is called a local waste pipe.

(56) **WATER SUPPLY.** (a) A *private water supply* is a privately owned supply not including any public utility or any water supply serving ten or more premises of mixed ownership.

(b) The *water service pipe* is the pipe from the water main, or private pumping system to the building served.

(c) The *water distribution pipes* are those which convey water from the service pipe to the plumbing fixtures.

(57) **WIPED JOINT** is the fusion of metal with solder, smoothly finished with a wiping cloth, and having a thickness of at least one-fourth inch, at the point where the pipes are joined.

(58) **WORKMANSHIP** is work of such character that will fully secure the results sought in all the sections of this code.

History: 1-2-56; (8), (42) (b) and (c); (46) and (49) am. Register, February, 1957, No. 14, eff. 3-1-57.

H 62.03 Fixture unit design basis. (1) **INTERMITTENT FLOW FIXTURES.** The fixture unit value and the size of traps, vents, and piping shall be as designated in the following table for any fixture named therein. Equivalent value for other intermittent operating fixtures shall be one fixture unit for each 7.5 gallons per minute of flow rate. (See table at top of page 211.)

(2) **CONTINUOUS FLOW FIXTURES.** Fixtures such as pumps, ejectors and compressors from which there is continuous or semi-continuous discharge shall have a fixture value of two for each one gallon per minute of flow.

to
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

62.025
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

to
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

Table referred to in H 62.03 (1):

Type of Fixture	Unit Value	Trap Minimum Size Inches	Soil or Waste Minimum Size Inches	Vent Minimum Size Inches
Bath Tub, all types*	3	1½	1½	1½
Bed Pan Washer	6	2	2	2
Bidet	4	2	2	1½
Cuspidor, fountain or dental	1	1¼	1¼	1¼
Dishwasher, residential	4	1½	1½	1½
Drinking Fountain	½	1¼	1¼	1¼
Floor Drain,				
2 inch	4	2	2	1½
3 inch or larger**	4	3	3	2
Laundry Tray	3	1½	1½	1½
Refrigerator, ice	½	1¼	1¼	1¼
Shower Stall, each head	4	2	2	1½
Sinks,				
combination	4	1½	1½	1½
factory wash-up	4	2	2	1½
fountain or bar	3	1½	1½	1½
glass or silver	3	1½	1½	1½
pack or plaster work	4	2	2	1½
residential	4	1½	1½	1½
restaurant, all types	4	2	2	1½
siphon jet	4	3	3	2
service sink, wall outlet	4	2	2	1½
service sink, floor outlet	4	3	3	2
surgeons wash-up	3	1½	1½	1½
Sterilizer,				
bed pan	4	2	2	1½
instrument or water	1	1¼	1¼	1¼
Urinal	4	2	2	1½
Wash basin	1	1¼	1½	1¼
Water Closet, any type	6	2	3	2

*Includes foot, Sitz and infant baths and regular bath tubs with or without shower.

**Trap and waste pipe sizes to correspond to floor drain when 4 inches or larger.

(3) UNIT CAPACITY AND LENGTH OF SANITARY PIPING. The number of fixture units connected to any stack, branch or vent and the length of piping shall not exceed that shown in the following table for a given diameter of pipe. After maximum length, including vent, for any given pipe size is reached, the diameter of the pipe shall be increased to the next size.

Pipe Diameter (inches)	Fixture Unit Capacity Soil, Waste or Vent Pipe			Maximum Length (in feet)
	On Stack	On Branch	On Vent	
1¼	1	1	1	50
1½	8	4	12	65
2	18	9	24	85
2½	40	20	60	105
3	84*	42	126	212
4	262	126	252	300
5	630	340	680	390
6	1,330	690	1,330	510
8	3,600	1,800	3,600	750
10	7,600	3,800	7,600	
12	12,000	6,000	12,000	

*See H 62.06 (2) on water closet limitations.

H 62.04 Building sewers. (1) PREMISES SERVED. The plumbing system of each new building, or a new plumbing system in an existing building, shall be entirely separate from and independent of that of any other building. Every building shall have an independent connec-

tion with a sanitary street sewer or sanitary main sewer when available. Private sanitary main sewers shall conform to specifications for public sewers and be approved by local authorities before installation.

(2) **MATERIALS.** All building sanitary sewers shall be constructed of cast iron, vitrified clay, concrete, asbestos cement pipe or other materials approved by the board for restricted, tentative or experimental use. See subsections H 62.15 (3) and (4); H 62.16 (1), (2), and (3); sections H 62.23, and H 63.01.

(3) **SLOPE.** Building sanitary sewers shall, where possible, have a slope of one-fourth inch per foot or more. In no case shall the slope of a building sanitary sewer be less than one-eighth inch per foot. Between the lot line and the street sewer, or riser pipe therefrom, the sewer shall be laid at a uniform slope not exceeding one-half inch per foot. Where the main sewer in the street has sufficient depth, or where a lot is 3 feet or more above the established grade line, the building sewer between the lot line and the building may receive greater inclination than one-half inch per foot as may be provided for by local ordinance, or as in the judgment of the authorized supervisor is acceptable.

(4) **SIZE.** (a) *Sanitary sewer.* The size of the building sanitary sewer shall be determined by the total number of fixture units tributary to such building sewer using the following table. The diameter of the building sewer shall be equal to or greater than that of the building drain. The minimum inside diameter of the building sanitary sewer shall be 4 inches.

Diameter of Pipe (inches)	Maximum Number of Fixture Units		
	$\frac{1}{8}$ " per ft. slope	$\frac{1}{4}$ " per ft. slope	$\frac{1}{2}$ " per ft. slope
4	115	160	210
5	270	370	540
6	510	720	1,050
8	1,290	1,860	2,640
10	2,520	3,600	5,250
12	4,390	6,300	9,300

(b) *Storm sewer.* The required size of building storm sewers, other exterior drains and lateral branches should be determined on the basis of the horizontal projection of roofs, yards and other tributary areas. A building storm sewer shall not connect to a building sanitary sewer. The building sanitary sewer and building storm sewer shall be installed separately and connected to the appropriate street or main sewer. In the event an existing adequate building sewer connects to a combined sewer or street sewer it may be continued in use as a common building sewer until such time as separation of storm water is accomplished. The size of interior roof leaders and building storm drains shall be determined on the total horizontal area to be drained thereby. The size of a smooth bore building storm drain or sewer should be at least equal to the size of a single vertical leader that would be required for the entire tributary area. The size of the vertical leader should be determined from the following table or be calculated using a formula which provides equivalent values.

Type of Roof	Allowable Roof Area in Square Feet for Given Size of Inside Leader					
	2½"	3"	4"	5"	6"	8"
Roof covered with gravel, slag or similar material with incline ¼" to 1' or less.....	Up to 1,646	1,646 to 2,120	2,121 to 3,780	3,781 to 5,835	5,836 to 8,490	8,491 to 15,125
Same with incline ½" to 1' or more and sawtoothed roofs.....	Up to 1,220	1,221 to 1,770	1,771 to 3,150	3,151 to 4,905	4,906 to 7,075	7,076 to 12,600
Metal, tile, brick, slate, or similar roofs of any incline.....	Up to 975	976 to 1,415	1,416 to 2,520	2,521 to 3,925	3,926 to 5,660	5,661 to 10,080

(5) ALIGNMENT. All building sanitary sewers shall be laid in alignment between fittings. Any changes in grade or direction shall be made with proper wyes or long radius fittings. Clipping of pipe or fittings is prohibited.

(6) INSTALLATION. (a) *Trenching*. All excavations shall be open trench work unless otherwise permitted by local ordinance or accepted by the local inspector.

Note: See sections Ind 6.06, 6.12 and 6.21 concerning timber requirements for trenches and general safety precautions.

(b) *Stable bottom*. Where the bottom of the trench can be maintained in a stable condition and free of water during time of installation of pipe, the building sanitary sewer, depending on the type of material used, shall be bedded and be initially backfilled as herein-after provided. Grade, as used in this subsection, is defined as the elevation of the bottom of the pipe.

1. Concrete, clay and asbestos-cement pipe. The trench bottom throughout its length shall be excavated to a depth at least 3 inches below the grade elevation and be brought back to grade with a sand, gravel, or crushed stone bedding which is tamped in place. The size of the bedding material shall be such that 100% shall pass a one-half inch sieve. The bedding shall be shaped to accommodate pipe bells or couplings. No planking or blocks shall be used to support the pipe. Initial backfill on the sides of the pipe and to a depth of 12 inches over the pipe for that portion of the building sewer located on private property shall be well tamped sand, gravel, crushed stone or excavated material which is neither corrosive nor organic in nature. The material shall be of such size that 100% shall pass a one-inch sieve. For that portion of the sewer located within the limits of the street, the initial backfill shall be sand, gravel or crushed stone of such size that 100% shall pass a one-inch sieve. Initial backfill shall be placed in increments not exceeding 6 inches in depth and be well tamped for the full length of the sewer.

2. Cast iron soil pipe. Where the trench bottom does not contain stone one inch or larger in size or where bedrock is not encountered, the trench for that portion of the sewer on private property may be

excavated to grade. When stone one inch or larger in size or when bedrock is encountered, the trench on private property shall be excavated to a depth at least three inches below the grade elevation and be brought back to grade with a bedding of sand, gravel, or crushed stone of which 100% shall pass a one-half inch sieve. The bedding material shall be tamped in place. Such three-inch deep bedding shall be used for that portion of the sewer located within the limits of the street. The bedding or trench bottom shall be shaped to accommodate the bells of the pipe. No planking or blocks shall be used to support the pipe. Initial backfill on the sides of the pipe and to a depth of 3 inches over the pipe for that part of the building sewer laid on private property shall be well tamped sand, gravel, crushed stone or excavated material which is neither corrosive nor organic in nature. The material shall be such that 100% shall pass a one-inch sieve. For that portion of the sewer in the street, the initial backfill material to a depth of 12 inches over the pipe shall be sand, gravel or crushed stone of such size that 100% shall pass a one-inch sieve. It shall be placed in increments not exceeding 6 inches and be well tamped.

(c) *Unstable bottom.* Where a mucky or unstable bottom is encountered in the trench, the required dry and stable foundation conditions shall be provided by sheathing driven and left in place to a depth of 48 inches below the trench bottom or to solid foundation at a lesser depth, the removal of wet and yielding material to a depth of 24 inches or to solid material, and replacement of the unstable material with limestone screenings, pea gravel or equivalent material for the bedding under the pipe. The trench bedding shall be shaped to accommodate pipe bells or couplings. In lieu of the foregoing, the required dry and stable foundation conditions may be provided by installation of a longitudinally reinforced concrete cradle at least 3 inches thick under the pipe, or by installation of a longitudinally reinforced concrete slab at least 3 inches thick and bedding material as provided for in subsection H 62.04 (6) (b) 1. Initial backfill material and its placement shall conform to that specified in subsections H 62.04 (6) (b) 1 and 2. All sheathing should be cut off at a depth of 3 feet or more below the ground surface to prevent heaving due to frost action.

(d) *Backfill completion.* Due care shall be exercised in placing the balance of the backfill to prevent breakage of the pipe. Large boulders or rock or concrete slabs, or frozen masses, shall not be used in the backfill nor shall machinery be operated within the trench until a cover of 6 feet over the pipe has been attained.

(e) *Inspection.* The building sewer shall be inspected upon completion of placement of the pipe and before backfilling. Upon request of the plumbing inspector, a tee shall be provided to permit testing the pipe for leakage or infiltration. Such tee, when used, shall be located as near as possible to the point of connection with the street or main sewer.

(7) **CONNECTIONS TO MAIN SEWER.** When a building connection on the street or main sewer is not found within 3 feet of the point designated by the local governing body, or its authorized representative, a "Y" or "T" fitting approved by the board shall be used. The connection shall be set upon or in a carefully cut opening centered in the upper quadrant of the street sewer, and be secured by encasement of

the main sewer pipe and the fitting with concrete at least 3 inches thick so as to assure permanency of connection and adequate backing of the street sewer pipe. In lieu of the use of fittings and in the event that the opening cannot be centered in the upper quadrant of the street sewer, a length of the street sewer pipe shall be removed and a "Y" branch section inserted in its place. The joints at the ends of such section shall be encased in concrete at least 3 inches thick. Such connection or insertion shall be made under the supervision of the authorized representative of the municipality. See subsection H 62.22 (2).

(8) **SEWER ENDS AND CONNECTIONS GUARDED.** The ends of all sanitary sewer pipes not immediately connected shall be securely closed so as to prevent the introduction of sand or earth or drainage from an excavation.

(9) **LIMITATION ON LOCATION.** The following minimum distances shall be maintained between building sewers and water wells:

- (a) Sewers of cast iron pipe—leaded joints—8 feet.
- (b) Sanitary sewers of material other than cast iron—25 feet.
- (c) Rain water drains or other clear water conductors—10 feet.

(10) **LIMITATIONS ON USE.** (a) *Sewers discharging objectionable liquids.* No person shall connect to a public sewer any sewer through which is discharged any substance likely to cause undue corrosion, obstruction, nuisance, explosion or interference with sewage treatment processes. See section H 62.11.

(b) *Storm and clear water connections prohibited.* Roof-leaders, surface drains, ground water drains, foundation footing drains, and refrigerator cooling water drains shall be connected wherever possible with a storm sewer, but they shall not be connected to a building sewer which discharges into a sanitary sewer or private sewage treatment plant. Air conditioning and clear water drains not described herein shall also discharge to storm drains or sewers unless special permission is obtained from the board by the local authority.

History: 1-2-56; am. (10) (b), Register, February, 1957, No. 14, eff. 3-1-57; am. Register, August, 1961, No. 68, eff. 9-1-61.

H 62.05 Building drains. (1) **ELEVATION.** All building drains shall be brought into the building underground, preferably below the level of the basement floor.

(2) **MATERIALS.** All building drains shall be constructed of vitrified clay, type L hard temper copper or cast iron pipe. The use of vitrified clay is permitted only where there is a soil covering of 18 inches or more or where the pipe is covered with 12 inches of soil and a substantial concrete floor. Where a building drain leaves the building at a point above the basement floor, it shall be constructed of cast iron or type L hard temper copper pipe to a point 5 feet from the inside of the building foundation wall or to such additional distance as necessary to reach undisturbed stable ground. See subsection H 62.22 (3).

(3) **SIZE.** The size of building drains and building sub-drains shall be determined by the number of fixture units tributary thereto. The minimum size of a building drain shall be 4 inches. The minimum size

of an underground building sub-drain shall be 3 inches. See subsections H 62.04 (4) (a) and H 62.10 (1).

(4) **BACKFLOW VALVES.** Building drains when subject to backflow or backwater at the time of installation, shall be provided with adequate backwater valves, installed to prevent interference with the flow or discharge of any fixture, and be readily accessible for cleaning. Provisions for a free circulation of air shall be made.

(5) **OTHER REQUIREMENTS.** Installation of building drains shall also conform to subsection H 62.04 (3) as to slope, subsections (5), (6), (8), (9) and (10); sections H 62.15 and H 62.16, insofar as they are applicable and necessary for proper installation.

History: 1-2-56; am. (1), (2) and (3), Register, February, 1957, No. 14, eff. 3-1-57; am. Register, August, 1961, No. 68, eff. 9-1-61.

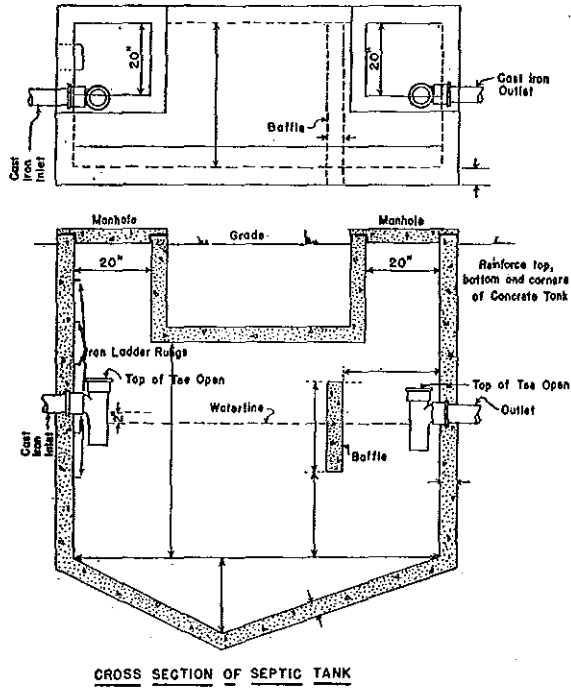
H 62.06 Stacks and branches. (1) **SOIL AND WASTE STACKS.** Every building in which plumbing fixtures are installed shall have a soil, waste or vent stack at least 3 inches in diameter extending through the roof with an increase or frost proof housing. See subsections H 62.07 (12), H 62.22 (4), (5), (6), (7).

(2) **SIZE.** The size of the stacks and branches shall be determined by the number of fixture units connected thereto. If pitch or grade of a soil or waste branch is 45 degrees or more, the same unit capacities as for vertical stacks will be permissible. Any underground branch shall be at least 2 inches in diameter. A water closet may connect to a 3 inch stack through a 4 x 3 inch bend. Not more than two water closets shall be connected to a 3 inch soil stack. Not more than one water closet shall be connected to a 3 inch branch. Two water closets located back to back shall be connected to a 3 inch soil stack with a 3 x 3 inch double wye and one-eighth bends or similar fittings or fitting. A sanitary cross will not be permitted. All waste openings provided for future use shall be properly vented and sealed. See subsections H 62.08 (1), (3).

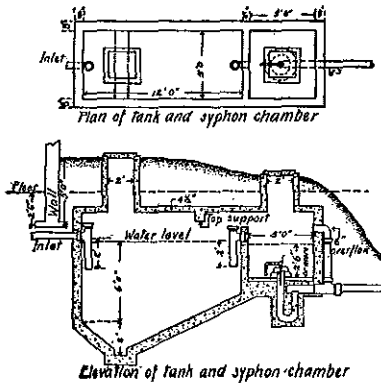
(3) **STACK CONNECTION AT BASE.** A long sweep one-fourth bend, two one-eighth bends, or a "Y" and one-eighth or one-sixth bend or its equivalent shall be used at the base of all soil and waste stacks. When such bend or fittings constitute the connection between a soil or waste stack and an underground house drain or branch of larger size than the soil or waste stack served, the increase shall be made above the floor unless a special approved fitting is used. See subsections H 62.22 (8), (9).

(4) **MULTIPLE BUILDING STACKS.** Where more than one unit in a motel, cabin court or mobile home park are connected to the same sewer or drain, a minimum vent stack of 2 inches may be permitted in each unit when the total number of fixture units does not exceed the capacity of such 2-inch pipe, provided that a full sized 3-inch stack is installed in the uppermost unit or at the upper end of the sewer. In the latter case the stack shall have frost protection. See subsections H 62.07 (12) (a).

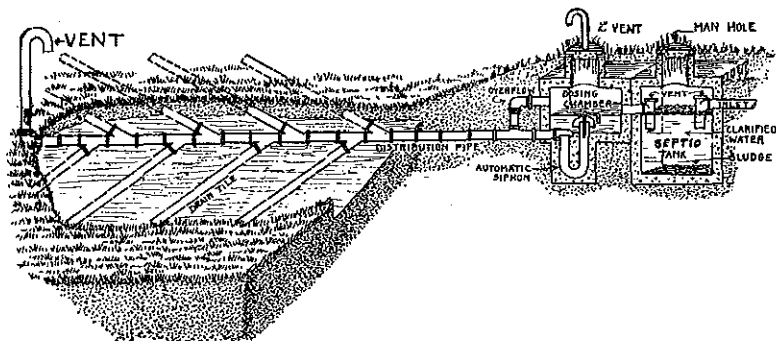
(5) **BRANCHES.** (a) *Soil and waste extensions.* Any branch extending from a soil or waste pipe, running vertically, horizontally, or both, shall be carried full size to fixture connections and shall



(43) Illustrating a large septic tank with hopper bottom and baffle. H 62.20 (1) (e).



(44) Showing a septic tank equipped with automatic siphon. H 62.20 (2) (c).



(45) Illustrating sewage, disposal system consisting of septic tank, dosing chamber, siphon and drainage tile. H 62.20 (2) (c), (3).

See Sec 70.17.2.1780

H 62.23 Approval on experimental basis. The board may approve materials, fixtures and layouts different than those set forth in this chapter for specific installations for experimental or trial purposes.

History: Cr. Register, February, 1957, No. 14, eff. 3-1-57.

H 62.24 Industrial commission regulations. The regulations of the industrial commission of Wisconsin pertaining to plumbing, toilet rooms, and sanitation of public buildings shall be followed wherever they are applicable.

Order IND. 4.420.

Orders IND. 17.2200 to IND. 17.2217, inclusive.

Orders IND. 23.5250 to IND. 23.5264, inclusive.

Orders IND. 23.5400 and IND. 23.5412.

Orders IND. 23.5500, IND. 23.5501, IND. 23.5532, IND. 23.5567, and IND. 23.5568 (7).

Orders IND. 23.5600, IND. 23.5611, IND. 23.5612, and IND. 23.5616.

Orders IND. 23.5700, IND. 23.5713, IND. 23.5714, IND. 23.5715 and IND. 23.5716.

Order IND. 24.5848.

History: 1-2-56; renum. from 62.23, Register, February, 1957, No. 14, eff. 3-1-57.