State of Wisconsin \ Department of Commerce

RULES in FINAL DRAFT FORM

Rule No.:	**Chs. Comm 2 and 81 to 87**
Relating to:	**Fees and Uniform State Plumbing Code**

COM-10544 (N.03/97)

The Wisconsin Department of Commerce proposes an order to:

repeal Comm 2.66(1)(b) 1.; 82.30 (3)(b) 32. a. and (9)(b) Note; and 82.40 (3) (e) 2. c.;

renumber Comm 2.66(1)(b)2.;

amend Comm 2.64 Table 2.64; 2.66 (title); Table 2.66; 81.01 (234) and (269); Table 81.20-4 and Table 81.20-10m, Tables 82.20-1; Table 82.20-2, Table 82.21-1; 82.30-1; 82.32(3)(a)3.; Table 82.38; 82.40 (3) (e) 2. b.; Tables 82.41-1 and Table 82.41-2; 82.41 (2), and (3) (a) 1. and (b) 7.; Table 82.50-1; 82.50 (3) (b) 5.; Table 82.70-1; Table 84.10 (line 9.); Table 84.11; 84.20(5)(p) 1.; Comm 84.30 (5) (c) 8. and Note, and 15; 84.30(6)(h)(intro.), (i) (intro.), and (j)(intro.) and 85.10 (1);

repeal and recreate Comm 82.36; 82.37(1)(c) Note; Table 82.40-9;

create Comm 81.01 (59m), (59s), (62s), (70m), (133s), (136s), (171e), (186s) and (256e); 82.20(1)(b) Note; 82.21 (1) (d) 5. Note; 82.365; 82.37(2)(a); 82.40(4)(a) 2.b. Note; Comm 82.40 (8) (i) 4.; 82.41 (3) (b) 4. d.; 82.51(3)(c) Note; 84.30 (4) (d) 3.; and 84.30(6)(k).

* *

ANALYSIS OF PROPOSED RULES

Statutory authority: Sections 101.19 (1) (a), 101.63 (1), 101.73 (2), 145.02 (2), 160.19, 160.21 (2) and 167, Stats.

Statutes interpreted: Sections 145.02 (2) and (3), and 145.13, Stats., the Department of Commerce has the responsibility of safeguarding public health and the waters of the state relative to the construction, installation and maintenance of plumbing. Additional authority has been granted to allow Commerce to establish fees, set inspection and construction standards and adopt rules to provide for public health, safety and welfare. To fulfill this responsibility the Department has promulgated the state uniform plumbing code, chapters Comm 81 to 87.

The Federal Clean Water Act requires all states to ensure that the nation's waters meet their fishable/swimable designation. In response, Wisconsin's DNR has established performance standards for urban stormwater runoff in chapter NR 151. The proposed revisions to chapter Comm 82 (specifically Comm 82.36 and 82.365) contain options for the designs of plumbing systems so as to aid citizens in their compliance with NR 151. The NR 151 provisions will become effective October 1, 2004.

State stormwater discharge permit rules, under chapter NR 216, have been updated to respond to EPA Phase II stormwater regulations, 40 CFR part 122.26(d). NR 216 also serves as the implementation vehicle for the NR 151 performance standards. Phase II regulates disturbed areas of 1 acre or more. The Federal construction site regulation for such sites requires the creation of a post construction stormwater management plan and implementation of that plan. Revisions to NR 216 require that these post construction stormwater management plans meet or exceed the performance standards set by NR 151.

Most of the commercial construction sites under Commerce authority will be affected by those DNR rules.

A comparison of the four surrounding states found the following. Both Iowa and Michigan have adopted national model codes. Iowa has adopted the Uniform Plumbing Code (UPC) and Michigan has adopted the International Plumbing Code (IPC). Minnesota's code is a state written uniform code and Illinois has a state written uniform plumbing code with exceptions for cities that existed prior to Illinois statehood.

The IPC, UPC and Minnesota's code require that all roofs, paved areas, yards, courts and courtyards drain into a separate storm sewer system, or a combined sewer system, or to an approved place of disposal. The "approved place of disposal" is defined as being approved by the authority having jurisdiction. Because of the flexibility of this requirement, a local authority in Iowa, Michigan, Minnesota or one of the cities adopting a national model plumbing code could allow subsurface infiltration. Illinois' code addresses piping materials for stormwater, not the acceptable discharge points, leaving the place of disposal unregulated at the state level.

The most significant difference in other state's codes and this proposal is the recognition and regulation of subsurface storm infiltration systems as viable means of managing stormwater. The subsurface infiltration requirements proposed for Wisconsin are based, in part on experience with Wisconsin private onsite wastewater treatment plumbing systems and knowledge acquired from other states (Maryland and Oregon) where stormwater infiltration has been an accepted practice.

The proposed revisions include minor changes to chapter Comm 2 related to fees for two products (commercial water vending or dispensing machines, and exterior grease interceptors) to be consistent with chapter Comm 84 product review requirements.

Chapter Comm 81; Revisions to chapter Comm 81 include definitions relating to stormwater and clearwater plumbing systems, and combination water service for fire protection systems. Also, the most current edition of NFPA 13D-2002, standard for the installation of sprinkler systems in one- and two-family dwellings and manufactured homes, is being incorporated by reference.

Chapter Comm 82; A number of additions and revisions are proposed for chapter Comm 82, relating to the design, construction, installation, supervision and inspection of plumbing.

A summary of the significant rule revisions in chapter Comm 82 is as follows:

1. Tables 82.20-1 and 82.20-2 are being amended to include submittals specific to use of the stormwater and reuse of clearwater, and stormwater plumbing conveyance, detention and infiltration systems.

2. Section Comm 82.36 is being repealed and recreated to reflect new options for the design, installation and maintenance of piping, devices and appurtenances in connection with stormwater and clearwater plumbing systems. Proposed changes in this section are as follows:

    - Options are allowed for designers to use tables, equations and computer models to comply with the performance requirements stated in the revisions.
    - Options are permitted for calculating the inputs to the plumbing system.
    - Requirements for calculating runoff volumes are created.
    - Tables Comm 82.36-1 to 82.36-4 have been revised for use with both horizontal and vertical piping and expressed in gallons per minute by pipe material and construction.
    - Detention on parking lots is limited to 6 inches in depth, except where prohibited by local ordinance.
    - The requirement for insulating stormwater piping is clarified so that only stormwater sewers affected by freezing and clearwater sewers require insulation.
    - The addition of language to allow pressurized discharges into stormwater piping under certain circumstances.
    - The addition of requirements for grates on stormwater horizontal piping inlets.
    - Operation and maintenance requirements are proposed for stormwater systems.

3. Section Comm 82.365 is created to address stormwater and clearwater infiltration systems. Proposed requirements are as follows.
    - Requirements for site and soil evaluation are added as a requirement for stormwater and clearwater infiltration systems.
    - Soil treatment volume limits are established by creating a new Table 82.365-1, and hydraulic application rates are assigned by the creation of Table 82.365-2.
    - Requirements are provided for groundwater mounding assessments for infiltration components with a width of more than 15 feet and depth to groundwater of more than 15 feet.
    - A requirement that dry detention systems must be designed to drain within 48 hours of a storm event.

4. Table Comm 82.70-1, plumbing treatment standards, is amended to prohibit the irrigation of food crops with plumbing system reuse water and to create a performance requirement for cyst and oocyst reduction for possible human contact water such as car washing and toilet and urinal flushing.

Chapter Comm 84; Section Comm 84.30 (6) is amended to recognize infiltration components allowed for use in designing stormwater infiltration systems. An additional paragraph recognizes synthetic aggregate for POWTS and stormwater infiltration systems.

Chapter Comm 85; Section Comm 85.10 (1) is amended to clarify that individuals who hold a soil tester credential or a professional soil scientist license may conduct soil evaluations for stormwater infiltration.

The proposed rule revisions were developed with the assistance of the Plumbing Advisory Code Council.

Name	Representing
Thomas Boehnen	American Society of Plumbing;
Rudy Petrowitsch	American Society of Sanitary Engineers
Jack Ellinger/Alex Newirth/Louie Pody	State AFL-CIO
Gary Kowalke	Plumbing contractors
Mark Krowski	City of Milwaukee, Plumbing Inspection
Jeff Kuhn	Plumbing and Mechanical Contractors of SE Wisconsin
Clint McCullough	Madison Contractors Association
Bob Netzler/Art Biesek	League of Wisconsin Municipalities
Joe Zoulek	Wisconsin Association of Plumbing, Heating, and Cooling Contractors, Inc.
Dave Viola	Plumbing Manufacturers Institute
Dale Schlieve	Wisconsin Society of Professional Designers of Engineering Systems, Inc.
Gene Shumann	Plumbing designers

Also assisting Commerce with these rule revisions were technical advisors Jim Davis and Steve Macejkovic (technical college instructors) and members of an *ad hoc* stormwater workgroup, which included the following individuals: Mazen Amer, City of Milwaukee - Engineering; Tom Cottreau, City of Milwaukee- Plumbing Inspection; Willie Gonwa; Tirad Engineering, Inc.; Dan Jensen; Weiser Concrete; Bob Pups, City of Greenfield - Plumbing Inspection; Mary Anne Lowndes, Wisconsin Department of Natural Resources (WDNR); and Jim Wolf, City of Madison - Plumbing Inspection.

SECTION 1. Comm 2.64 Table 2.64-1 (partial) is amended to read:

Table 2.64-1 (partial)

Plan Examination Fees for Plumbing Systems

	Plan Type	Fee
~~5~~*6.	~~Building storm and clear~~ Clearwater drain system ….	$10.00 per inch diameter of each ~~bldg. storm sewer, or for multiple sewer discharge points for a single site the fee may be calculated per sub. (3) (c)~~ clearwater drain system
*~~6~~5.	Car wash interceptor …….	$70.00 per interceptor
18.	~~Storm private interceptor main sewers, determined on the largest diameter of each interceptor main sewer~~ Stormwater systems: …….……..……	~~$10.00 per inch diameter~~
	Less than or equal to one acre drainage area …..	$10.00 per inch of largest diameter storm sewer, or for multiple sewer discharge points for a single site the fee may be calculated per sub. (3)(c)
	> one or equal to 5 acres drainage area……..	$350.00
	> 5 acres to < or equal to 15 acres drainage area..	$400.00
	> 15 acres drainage area……	$500.00
21.	Stormwater and clearwater infiltration systems for public buildings or facilities ……..……..	$100.00 per system **

* ~~Note:~~ For table entries ~~6 to 11~~ 5. to 11., no additional fee would be required if submitted with the ~~sanitary~~ respective drain and vent system.

** ~~Note:~~ This fee is in addition to building ~~storm and clear water~~ stormwater and clearwater plumbing systems.

SECTION 2. Comm 2.66 (title) is amended to read:

Comm 2.66 Product and standard approvals.

SECTION 3. Comm 2.66 Table 2.66 (partial) is amended to read:

Table 2.66 (partial)

Plumbing Product and Alternate Standard Review Fees

Product or Standard	Fee	
	Type of Review	
	New Review	Revision or Renewal
9. Commercial water vending or dispensing machines	$200.00	$100.00
10. Exterior grease interceptors	$200.00	$100.00

SECTION 4. Comm 2.66 (1) (b) 1. is repealed.

SECTION 5. Comm 2.66 (1) (b) 2. is renumbered Comm 2.66 (1) (b).

SECTION 6a. Comm 81.01 (59m), (59s), (62s), (70m), (129s), (133s), (136s), (171e), (186s) and (256e) are created to read:

Comm 81.01 (59m) "Combination private water main" means a private water main that serves a fire protection system and any number of plumbing fixtures.

(59s) "Combination water service" means a water service that serves a fire protection system and any number of plumbing fixtures.

(62s) "Conveyance system" means that portion of a drain system that consists of a series of pipes that transport water from one area to another without providing detention.

(70m) "Detention" means the collection and temporary storage of water for subsequent gradual discharge.

(133s) "Infiltration component" means any device or method that is intended to promote the assimilation of water into in situ soil.

(136s) "Irrigation" means the application of water to the root zone of plants or plantings.

(171e) "Peak flow, stormwater" means the largest anticipated flow from a given storm event.

(186s) "Pre-development" means the condition of the topography of vegetation, including that resulting from human activities that existed prior to land disturbance for construction.

(256e) "Ten-year, 24-hour storm" or "10-year, 24-hour storm" means a discrete rain storm event characterized by a specific duration, temporal distribution, rainfall intensity, return frequency and total depth of rainfall.

Note: The frequency, intensity and duration of rainfall varies considerably during a storm by geographic location. Precipitation frequency atlases, NOAA Atlas 2, have been prepared by the National Oceanic and Atmospheric Administration (NOAA), National Weather Service. In chapter Comm 82, this value may be expressed as a specific "design storm". The calculated volume of rainfall, or stormwater, may be determined from this value and used to calculate peak discharge.

SECTION 6b. Comm 81.01 (234) and (269) are amended to read:

Comm 81.01 (234) "Stack vent" means a vent extending from the top of a drain stack of at least two branch intervals.

(269) "Vent stack" means a vertical vent pipe ~~which extends one or more stories~~ that provides air for a drain stack of two or more branch intervals.

SECTION 6c. Comm 81.20 Table 81.20-4 (partial) and Table 81.20-10m is amended to read:

Table 81.20-4

	ASSE	**American Society of Sanitary Engineering P.O. Box 9712 Bay Village, Ohio 44140**
	Standard Reference Number	**Title**
13.	1013-99	Reduced Pressure Backflow Preventer and Reduced Pressure Detector Fire Protection Principle Backflow ~~Prevention Assemblies~~ Preventers
23.	1047-99	Reduced Pressure Detector ~~Fire Protection~~ Backflow ~~Prevention Assemblies~~ Preventer

Table 81.20-10m

	NFPA	**National Fire Protection Association 11 Tracy Drive Avon, MA 02322-9908**
	Standard Reference Number	**Title**
1.	NFPA 13D-~~1999~~ 2002	Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes
2.	NFPA 24 – 2002	Standard for the Installation of Private Fire Service Mains and Their Appurtenances

SECTION 7. Comm 82.20 (1) (b) 1. Note is created to read:

Comm 82.20 (1) (b) 1. Note: For a listing of agent municipalities, see Appendix A-82.20 (2).

SECTION 8. Comm 82.20 Table 82.20-1 is amended to read:

Table 82.20-1 (partial)
SUBMITTALS TO DEPARTMENT

	Type of Plumbing Installation
8.	~~Subsurface storm water or subsurface clear water dispersal plumbing systems in connection with public buildings~~ Stormwater and clearwater infiltration plumbing systems serving a public building or facility.[d]
9.	Plumbing ~~water treatment systems~~ wastewater reuse systems and stormwater use systems, other than POWTS, designed to treat water for compliance with Table 82.70-1.[c]

[d] Agent municipalities may perform this review when so authorized by the department. For additional information, refer to Appendix.

SECTION 9. Comm 82.20 Table 82.20-2 (partial) is amended to read:

Table 82.20-2 (partial)
SUBMITTALS TO DEPARTMENT OR AGENT MUNICIPALITY

	Type of Plumbing Installation
7.	Piping designed to serve as private interceptor main sewers greater than 4 inches in diameter when sized for gravity flow ~~as specified in Table 82.30-1~~.
9.	Stormwater systems, not including infiltration plumbing systems, serving a public building or facility where the drainage area is one acre or more. [d]

[d] Plan review involving 16 or more plumbing fixtures also applies.

SECTION 9a. Comm 82.21 (1) (d) 5. Note is created to read:

Comm 82.21 (1) (d) 5. **Note:** Standard NFPA 24 for combination water services and combination private water mains may include more stringent requirements for testing.

SECTION 9b. Comm 82.21 Table 82.21-1 (partial) is amended to read:

Table 82.21-1
TESTING AND SUBMITTING REQUIREMENTS FOR CROSS CONNECTION CONTROL DEVICES OR ASSEMBLIES

Industry Common Name of Assembly	ASSE Standard Name and Number	CAN/CSA Standard Name and Number	ASSE Test Standard	Test Results Submitted To Department and Purveyor
RP	Reduced pressure principle backflow ~~preventer~~ preventers and reduced pressure fire protection principle backflow preventers ASSE 1013	Backflow ~~preventer~~ preventers, reduced pressure principle type (RP) CAN/CSA-B64.4-94	5010-1013-1	Yes
RP Detector	Reduced pressure detector fire prevention backflow ~~preventer~~ prevention assemblies ASSE 1047	— —	5010-1047-1	Yes

SECTION 10a. Comm 82.30 (3)(b) 32. a. and (9) (b) Notes are repealed.

SECTION 10b. Comm 82.30 Table 82.30-1 is amended to read:

Table 82.30-1(partial)
DRAINAGE FIXTURE UNIT VALUES BY FIXTURE TYPE

Type of Fixture	Drainage Fixture Unit Value (dfu)	Trap Size Minimum Diameter (inches)
Lavatory …….……..	1	1 ¼
Lavatory, combination per trap ……	1	1 ½
Sinks:[i]		
Bar, residential ……..…	1	1 ¼

SECTION 11. Comm 82.32 (3) (a) 3. is amended to read:

Comm 82.32 (3) (a) 3. Storm drains as provided in s. Comm 82.36 ~~(14) (b)~~ (12) (a).

SECTION 12. Comm 82.36 is repealed and recreated to read:

Comm 82.36 Stormwater and clearwater plumbing systems. (1) SCOPE. The provisions of this section set forth the requirements for the design, installation and maintenance of piping, conveyance, venting, detention and treatment of stormwater and clearwater in plumbing systems.

Note: Refer to ch. NR 151 for stormwater management requirements.

(2) MATERIALS. All stormwater and clearwater plumbing systems shall be constructed of approved materials in accordance with s. Comm 84.30 (3).

(3) DESIGN OF STORMWATER PLUMBING SYSTEMS. (a) Plumbing systems upstream of detention shall be designed, at a minimum, based on the 10-year, 24-hour storm event.

(b) Plumbing detention systems and plumbing systems located downstream of detention shall be designed based on anticipated flows and volumes.

(c) Stormwater and clearwater infiltration systems shall comply with s. Comm 82.365.

Note: For a listing of best management practices (BMPs) refer to Appendix A-82.36 (3)-1.

Note: Where local discharge requirements are more stringent, stormwater plumbing systems may provide detention and treatment to comply with the local stormwater management plan.

(4) DISCHARGE, DISPERSAL, CLEARWATER REUSE OR STORMWATER USE. (a) *Discharge points.* The discharge points for stormwater and clearwater shall be as specified in Table 82.38-1.

(b) *Segregation of wastewater.* 1. Except as provided in subd. 2., stormwater or clearwater piping may not connect to a sanitary drain system.

2. Where a combined sanitary-storm sewer system is available, stormwater, clearwater and sanitary wastewater may be combined in the building sewer.

3. Stormwater gravity drains shall not be combined with clearwater drains prior to discharging to the storm building drain, unless the clearwater drains are protected by a check valve or backwater valve.

Note: See also Table 82.38-1 which limits clearwater discharges to sanitary sewer at 50 gpd.

Note: For the use of stormwater or reuse of clearwater, refer to the appropriate requirements in ss. Comm 82.30, 82.34, 82.40, 82.41, 82.70 and this section.

(5) INPUT CALCULATIONS. (a) *Peak flow.* The peak flow of stormwater influent to a plumbing system shall be calculated using any of the following methods:

1. 'Area method.' For sizing of conveyance piping, when calculating stormwater peak flow based on the tributary area, the area in square feet shall be divided by the following applicable divisors:

a. For roofs the divisor is 26 square feet/gpm.

b. For paved or graveled ground surfaces the divisor is 32.5 square feet/gpm.

c. For lawns, parks and similar land surfaces the divisor is 104 square feet/gpm.

Note: For example, 10,000 square feet of roof area/26 square feet/gpm = 385 gpm or 0.85 cubic feet/second.

2. 'Rational method.' For calculating peak flow, the intensity shall be determined using the time of concentration for the tributary area.

Note: For the equation procedure for runoff coefficients for use with the rational method, refer to Appendix A-82.36 (5)-1.

3. 'Engineering analysis method.' An engineering analysis, acceptable to the department, shall be based on the peak flow calculated in accordance with sub. (3) (a).

Note: A model that calculates peak flow such as SWMM, TR-20, TR-55, P8 or an equivalent methodology may be used.

(b) *Volume.* The volume of stormwater influent to a plumbing system shall be based on an engineering design acceptable to the department and a minimum of a two-year, 24-hour storm event and designed so that no property damage occurs at 100-year, 24-hour storm event with a Type II distribution.

Note: For runoff coefficients and use of other methods or models, refer to Appendix A-82.36 (5)-2 and A-82.36 (5)-3.

Note: The intensity of rainfall varies considerably during a storm as well as geographic regions. To represent various regions of the United States, the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) developed four synthetic 24-hour rainfall distribution types from available National Weather Service (NWS) duration-frequency data (Hershfield 1961; Frederick et al., 1977) or local storm data. Type IA is the least intense and type II is the most intense short duration rainfall. Types I and IA represent the Pacific maritime climate with wet winters and dry summers. Type III represents Gulf of Mexico and Atlantic coastal areas where tropical storms bring large 24-hour rainfall amounts. Type II represents the rest of the country, including Wisconsin. For more information, see the USDA-NRCS webpage: http://www.nrcs.usda.gov/.

(c) *Additional inputs to stormwater systems.* Additional inputs to stormwater systems shall be estimated based on anticipated flows and volumes.

(6) CONVEYANCE AND DETENTION SYSTEMS. (a) *Design.* The design of stormwater and clearwater conveyance systems shall conform to all of the following:

1. Horizontal stormwater conveyance piping shall be sized using either of the following:

a. An engineering analysis, based on full flow capacity, acceptable to the department.

b. Tables 82.36-1 to 82.36-5 based on pipe type, diameter and pitch.

Table 82.36-1

MAXIMUM CAPACITY OF STORMWATER CONVEYANCE PIPING FOR PVC, ASTM D1785, D2665, F891 and ABS, ASTM D1527, D2661, F628

Nominal Pipe Size (in inches)	Maximum Capacities in gallons per minute (gpm)					
	Pitch of Piping Per Foot					
	1/32 inch (0.26% slope)	1/16 inch (0.52% slope)	1/8 inch (1.04% slope)	¼ inch (2.08% slope)	½ inch (4.16% slope)	Vertical
3	30	40	60	80	110	89
4	60	80	120	160	230	183
5	110	150	210	300	420	334
6	170	240	340	480	690	545
8	360	510	710	1,010	1,430	1,133
10	660	930	1,310	1,850	2,620	2,079
12	1,050	1,480	2,090	2,960	4,180	3,316
14	1,350	1,900	2,690	3,810	5,390	4,271
16	1,920	2,720	3,840	5,440	7,690	6,097
18	2,630	3,720	5,270	7,440	10,520	8,348
20	3,520	4,970	7,030	9,956	14,060	11,155
24	5,750	8,140	11,490	16,260	22,990	18,244

Note: To convert to cubic feet per second (cfs) divide gpm by 448.8.

Table 82.36-2

MAXIMUM CAPACITY OF STORMWATER HORIZONTAL CONVEYANCE PIPING FOR PVC, ASTM D3034

Nominal Pipe Size (in inches)	Maximum Capacities in gallons per minute (gpm)				
	Pitch of Piping Per Foot				
	1/32 inch (0.26% slope)	1/16 inch (0.52% slope)	1/8 inch (1.04% slope)	¼ inch (2.08% slope)	½ inch (4.16% slope)
4	60	80	110	160	220
6	160	230	320	450	640
8	350	490	700	990	1,400
10	630	900	1,270	1,790	2,540
12	1,010	1,430	2,020	2,850	4,040
15	1,730	2,450	3,460	4,900	6,920

Note: To convert to cubic feet per second (cfs) divide gpm by 448.8.

Table 82.36-3

MAXIMUM CAPACITY OF STORMWATER CONVEYANCE PIPING FOR CAST IRON, ASTM A74 and ASTM A888

Nominal Pipe Size (in inches)	Maximum Capacities in gallons per minute (gpm)					
	Pitch of Piping Per Foot					
	1/32 inch (0.26% slope)	1/16 inch (0.52% slope)	1/8 inch (1.04% slope)	¼ inch (2.08% slope)	½ inch (4.16% slope)	Vertical
3	20	30	40	60	80	80
4	50	60	90	130	180	173
5	80	120	170	230	330	315
6	140	190	270	380	540	516
8	290	420	590	830	1,170	1,118
10	540	770	1,090	1,540	2,170	2,068
12	870	1,230	1,740	2,490	3,490	3,318
15	1,630	2,310	3,270	4,620	6,530	6,217

Note: To convert to cubic feet per second (cfs) divide gpm by 448.8.

Table 82.36-4

MAXIMUM CAPACITY OF STORMWATER HORIZONTAL CONVEYANCE PIPING FOR CONCRETE, ASTM C76 and ASTM C14

Nominal Pipe Size (in inches)	Maximum Capacities in gallons per minute (gpm)				
	Pitch of Piping Per Foot				
	1/32 inch (0.26% slope)	1/16 inch (0.52% slope)	1/8 inch (1.04% slope)	¼ inch (2.08% slope)	½ inch (4.16% slope)
4	40	60	90	120	170
6	130	180	260	360	510
8	280	390	550	780	1,110
10	500	710	1,000	1,420	2,010
12	820	1,150	1,630	2,310	3,260
15	1,480	2,090	2,960	4,180	5,910
18	2,400	3,400	4,810	6,800	9,620
21	3,630	5,130	7,250	10,260	14,500
24	5,180	7,320	10,350	14,640	20,710
27	7,090	10,020	14,170	20,050	28,350
30	9,390	13,270	18,770	26,550	37,550
33	12,100	17,120	24210	34,230	48,410
36	15,260	21,590	30,530	43,170	61,060
39	18,900	26,720	37,790	53,440	75,580
42	23,020	32,560	46,050	65,120	92,100
48	32,870	46,490	65,740	92,980	131,490
54	45,000	63,640	90,010	127,290	180,010
60	59,600	84,290	119,200	168,580	238,410

Note: To convert to cubic feet per second (cfs) divide gpm by 448.8.

Table 82.36-5
MAXIMUM CAPACITY OF STORMWATER HORIZONTAL CONVEYANCE PIPING FOR ELLIPTICAL REINFORCED CONCRETE PIPE

Pipe Diameters in inches (circular pipe equivalent)	Maximum Capacities in gallons per minute (gpm)			
	Pitch of Piping Per Foot			
	1/16 inch (0.52% slope)	1/8 inch (1.04% slope)	¼ inch (2.08% slope)	½ inch (4.16% slope)
14 X 23 (18)	3,300	4,675	6,700	9,500
19 X 30 (24)	7,200	10,060	14,700	21,000
24 X 38 (30)	13,250	18,740	26,500	37,475
29 X 45 (36)	21,545	30,475	43,095	60,940
34 X 53 (42)	32,500	45,965	65,000	91,925
38 X 60 (48)	46,405	65,625	92,800	131,245
43 X 68 (54)	63,525	89,840	127,050	179,800
48 X 76 (60)	84,135	118,985	168,270	237,965

2. a. A vertical conductor for stormwater may not be smaller than the largest horizontal branch discharging into the conductor.

b. Vertical conductors shall be sized in accordance with Tables 82.36-1 and 82.36-3 or by an engineering analysis acceptable to the department.

Note: For the use of Baird's equation, refer to Appendix A-82.36 (6)-1.

3. Clearwater conveyance systems shall be sized in accordance with s. Comm 82.30 (3) and (4).

4. Underground, gravity-flow storm building sewers shall have a minimum 3-inch inside diameter.

(b) *Velocity in stormwater conveyance system piping.* The pitch of stormwater conveyance system piping shall be designed to create a minimum velocity of one foot per second when flowing full.

(c) *Fittings and connections*. 1. Except as provided in subd. 2., fittings and connections for stormwater and clearwater conveyance systems shall be comply with s. Comm 82.30 (8) and (9).

2. The minimum radius for the first 90º fitting located downstream of a roof drain shall comply with the horizontal to vertical requirements in Table 82.30-4.

(d) *Stack offsets*. Stack offsets for piping of a clearwater conveyance system piping shall comply with s. Comm 82.30 (6).

(e) *Pitch of clearwater gravity conveyance system piping.* 1. The minimum pitch of gravity conveyance system piping having a 2-inch inside diameter or less shall be 1/8 inch per foot.

2. The minimum pitch of clearwater gravity conveyance system piping having at least a 3-inch inside diameter or more shall be 1/16 inch per foot.

(f) *Branch connections near base of stack.* Branch drains from interior clearwater inlets may not connect downstream from the base fitting or fittings of a drain stack within a distance equal to 20 pipe diameters of the building drain.

(g) *Detention systems.* 1. The storage volume of a dry detention system shall be designed and installed with a drain time of 72 hours after a storm event.

2. Paved surfaces or parking lots serving as detention areas shall be limited to a design depth of 6 inches, unless otherwise limited by local ordinance.

3. By design, ground surface ponding shall drain within 24 hours after a storm event.

(7) OTHER DESIGN REQUIREMENTS. (a) *Subsoil drains.* 1. A subsoil drain discharging to a plumbing system shall discharge into an area drain, manhole or storm sewer, trapped receptor or a sump with a pump.

2. Where a foundation drain is subject to backwater, the drain shall be protected by a backwater valve or a sump with a pump.

(b) *Backwater valve.* All backwater valves shall be accessible for maintenance.

(c) *Sewer location.* 1. No storm building sewer or private interceptor main storm sewer may pass through or under a building to serve another building, unless one of the following conditions is met:

a. The storm building sewer or private interceptor main storm sewer serves farm buildings or farm houses, or both, that are located on one property.

b. Where a storm building sewer or private interceptor main storm sewer serves buildings that are located on one property, a document that indicates the piping and distribution arrangement for the property and buildings is recorded with the register of deeds no later than 90 days after installation.

2. The location of storm building drains and building sewers shall comply with ss. Comm 82.30 (11) (d) and 82.40 (8) (b) 7.

(d) *Installation requirements.* 1. The connection of a stormwater leader discharging to a storm building sewer shall be made above the finished grade.

Note: For more information regarding joints and connections, refer to s. Comm 84.40.

2. The elevation of a storm building drain shall comply with s. Comm 82.30 (11) (b) 1.

3. Interior inlets and drains subject to backflow or backwater shall be protected with a check valve or backwater valve.

4. Storm building drains and building sewers shall be installed to comply with s. Comm 82.30 (11) (e).

5. Storm building sewer connections to public sewers shall be in accordance with s. Comm 82.30 (11) (f).

6. Cleanouts for conveyance system piping shall be installed in accordance with s. Comm 82.35.

7. Storm building sewers that receive clearwater and that may be subject to freezing shall be installed in accordance with s. Comm 82.30 (11) (c) 2.

8. Storm building drains, clearwater building drains, and building storm sewers and appurtenances shall be separated from water wells by the applicable separation distances contained in chs. NR 811 and 812 or as otherwise permitted by the department of natural resources.

9. All underground stormwater storage tanks for water reuse shall be separated from sanitary sewers by a minimum of 8 feet.

(8) SUMPS AND PUMPS (a) *Sumps.* 1. 'General.' All storm building subdrains shall discharge into a sump, the contents of which shall be automatically lifted and discharged, dispersed or used in accordance with sub. (4).

2. 'Construction and installation'. a. Except as provided in subd. c. and d., an interior sump shall have a rim extending at least one inch above the floor immediately adjacent to the sump.

b. A sump shall have a removable cover of sufficient strength for anticipated loads.

c. Where a sump is installed in an exterior meter pit or elevator pit, the rim may be level with the floor.

d. When a sump is provided with an airtight, solid cover.

3. 'Location'. All sumps installed for the purpose of receiving clearwater, groundwater or stormwater shall be separated from water wells by the applicable separation distances contained in chs. NR 811 and 812, or as otherwise permitted by the department of natural resources.

Note: See Appendix A-82.30 (11) (d) for material reprinted from s. NR 812.08.

4. 'Size'. Except as recommended by the pump manufacturer, the size of each sump shall be no smaller than 16 inches in diameter at the top, 14 inches in diameter at the bottom, and 22 inches in depth.

(b) *Pumps.* 1. 'Size.' The pump shall be of a capacity appropriate for the anticipated use.

2. 'Discharge piping.' a. Where a pump discharges into a storm drain system, a check valve shall be installed.

b. The minimum diameter discharge piping shall be based on the design flow rate of the pump and a minimum velocity of one foot/second.

(9) INLET REQUIREMENTS. (a) *Interior clearwater drain inlets.* Interior clearwater drain inlets shall terminate at least one inch above the finished floor.

(b) *Exterior stormwater inlets.* 1. 'Construction.' a. All exterior stormwater inlets shall be constructed of material in accordance with s. Comm 84.30.

Note: For additional information on approved materials, refer to s. Comm 84.30 (3) (f).

b. All exterior stormwater inlets subject to vehicular traffic shall be set on a suitable base capable of sustaining the anticipated load.

2. 'Design'. All exterior stormwater inlets shall be designed for the anticipated flow.

Note: For manhole requirements, refer to s. Comm 82.35 (3).

3. 'Inlet grates'. a. General. All inlets shall be provided with a well-fitted, removable grate of a thickness and strength to sustain the anticipated loads.

Note: Sections Comm 62.1101 to 62.1110 specify that for floor or ground surface inlets when placed within an identifiable accessible route, openings in the floor or ground surface shall be of a size that does not permit the passage of a ½-inch sphere. Also, it states that grates having elongated openings be placed so that the longest dimension is perpendicular to the dominant direction of travel.

b. Floor or ground surface inlets. Openings in the floor or ground surface shall be of a size that prohibits the entrapment of wheeled vehicles, wheelchairs or pedestrians within the grate openings.

c. Grates on horizontal pipes. Grates shall be provided on horizontal inlets greater than 6 inches in diameter. The grates shall be placed so that the rods or bars are not more than 3 inches downstream of the inlet. Rods or bars shall be spaced so that the openings do not permit the passage of a 6-inch sphere.

Note: See Appendix A-82.36 (9) for further explanatory material.

(c) *Subsurface areas of 50 square feet or less.* Other than stairwells, all subsurface areas not exceeding 50 square feet and exposed to the weather, shall comply with one of the following:

1. Drain to foundation drains through a minimum 2-inch diameter pipe or a through a continuous layer of washed stone aggregate.

2. Drain to the storm building drain, storm subdrain or storm sewer through a minimum 3-inch diameter pipe.

(d) *Subsurface areas of more than 50 square feet and stairwells.* An area drain shall be provided in subsurface areas greater than 50 square feet and in all stairwells exposed to the weather. The area drain shall comply with all of the following:

1. Drain to the storm building drain, storm subdrain or storm sewer.

2. The fixture drain shall have a minimum 3-inch inside diameter and may not discharge into a subsoil or foundation drain.

(10) ROOF DRAINS. (a) *General roofs.* Roof drains shall be equipped with strainers extending not less than 4 inches above the surface of the roof immediately adjacent to the roof drain. Strainers shall have an available inlet area above the roof of not less than 1.5 times the area of the conductor to which the drain connects.

(b) *Flat decks.* Roof drain strainers used on sun decks, open parking decks and similar areas shall be of the flat surface type, shall be level with the deck and shall have an available inlet area of not less than 2 times the area of the conductor to which the drain connects.

(11) OVERFLOW SYSTEMS. (a) *Prohibited connection.* An overflow roof drain system may not connect to the primary roof drain system.

(b) *Discharge.* All overflow roof drain systems shall discharge in accordance with Table 82.38-1.

(12) TRAPS AND VENTS. (a) *Traps.* 1. Traps are required for interior drain inlets receiving clearwater.

2. Except for exterior loading dock drains, traps are required for exterior drain inlets located within 10 feet of an air inlet, door or openable window.

3. More than one drain inlet may discharge to the same trap.

4. A foundation drain that discharges by gravity to a storm sewer shall be trapped. The trap shall be provided with cleanouts.

(b) *Vents.* 1. A trap receiving clearwater shall be vented in accordance with s. Comm 82.31. Vent piping for a clearwater drain system may not be connected to a vent system serving a sanitary drain system or chemical waste system.

2. a. Vents serving a solid covered sump shall terminate a minimum of one inch above finished floor.

b. Sump vents shall be sized as per Table 82.31-4.

(13) OPERATION AND MAINTENANCE. (a) *Plan.* An operation and maintenance plan shall be implemented for all stormwater plumbing systems for drainage areas of one or more acres that are installed on or after the effective date of this section [Revisor to insert date].

(b) *Plan information.* An operation and maintenance plan as required in par. (a) shall include at least all of the following information, applicable to the system:

1. Accumulated solids or byproduct removal requirements.

2. Identification of safety hazards.

3. Cleaning and inspection schedule.

4. Inspection and maintenance checklist, including at least the following items:

a. Filters.

b. Disinfection units.

c. Sedimentation chambers.

d. Detention devices.

e. Infiltration systems.

5. Start up and shutdown procedures.

6. Vector control requirements.

7. A contingency plan in the event of system failure.

(c) *Plan location.* The operation and maintenance plan shall remain onsite and be available for inspection when requested by the department.

(d) *Record of maintenance*. When requested the owner shall make available for inspection all maintenance records to the department or agent for the life of the system.

SECTION 13. Comm 82.365 is created to read:

Comm 82.365 Stormwater and clearwater subsurface infiltration plumbing systems. (1) SCOPE. The provisions of this section set forth the requirements for the design, installation and maintenance of stormwater and clearwater subsurface infiltration plumbing systems serving building sites.

Note: The department of natural resources has registration requirements for class V injection wells. See Appendix A-82.365 (1) for further explanatory material.

(2) SITE AND SOIL EVALUATION. (a) *Site evaluation.* A site evaluation shall be conducted in accordance with the methods and standards as provided in ch. Comm 85.40 (3) (a).

(b) *Soil evaluation.* 1. A soil evaluation shall be conducted in accordance with the methods and standards as provided in s. Comm 85.30 (1) (c).

2. Individuals qualified to conduct soil evaluation under this subsection shall be an individual that maintains either a registration as provided in s. Comm 5.33 or a license as provided in ch. GHSS 4.

(3) INFILTRATION SYSTEM DESIGN. (a) *Influent quality.* For stormwater and clearwater infiltration plumbing systems, the influent quality shall comply with the requirements in Table 82.70-1 for subsurface infiltration and irrigation.

(b) *In situ soil requirements.* 1. Except as provided in subd. 2., the minimum depth of suitable in situ soil for infiltration systems shall be as specified in Table 82.365-1 to separate the system from the highest groundwater elevation or bedrock. When groundwater mounding calculations affect the depth to seasonal groundwater, the depth of suitable soil shall be measured to the calculated elevation of mounded groundwater.

2. For roof runoff or where treatment has afforded an equivalent level of water quality, the depth of in situ soil shall be no less than one foot of materials finer than coarse sand.

Note: See Appendix for representative water quality levels.

Table 82.365-1
DEPTH OF SUITABLE SOILS BY USDA SOIL TEXTURE AND PERCENT FINES OF THE INFILTRATIVE SURFACE

Soil Texture	Minimum 5 ft. of Suitable Soil Separation and ≥10% but <20% Fines [a]		Minimum 3 ft. of Suitable Soil Separation and ≥20% Fines [a]	
	Texture Suitability	Maximum Rock Fragment Content [b]	Texture Suitability	Maximum Rock Fragment Content [b]
Sands				
COS	NP [c]	--	NP	--
S	NP [c]	--	NP [c]	--
FS	NP [c]	--	NP [c]	--
VFS	X	NP [c] > 60%	X	NP [c] > 20%
Loamy sands				
LCOS	X	NP [c] > 0%	NP [c]	--
LS	X	NP [c] > 0%	NP [c]	--
LFS	X	NP [c] > 0%	NP [c]	--
LVFS	X	NP [c] > 82%	X	NP [c] > 63%
Sandy loams				
COSL	X	NP [c] > 56%	X	NP [c] > 13%
SL	X	NP [c] > 56%	X	NP [c] > 13%
FSL	X	NP [c] > 56%	X	NP [c] > 13%
VFSL	X	NP [c] > 74%	X	NP [c] > 47%
Loam (L)	X	NP [c] > 79%	X	NP [c] > 58%
Silt Loam (SIL)	X	NP [c] > 84%	X	NP [c] > 68%
Silt (SI)	X	NP [c] > 88%	X	NP [c] > 75%
Clay Loams				
SCL	X	NP [c] > 71%	X	NP [c] > 43%
SICL	X	NP [c] > 88%	X	NP [c] > 75%
CL	X	NP [c] > 81%	X	NP [c] > 63%
Clays				
SC	X	NP [c] > 78%	X	NP [c] > 56%
SIC	X	NP [c] > 88%	X	NP [c] > 75%
C	X	NP [c] > 82%	X	NP [c] > 63%

NP = Not permitted.
X = Suitable for use under the specified conditions.
[a] Fines are mineral particles passing a 200 mesh sieve (less than 0.075mm). Content is measured by weight.
[b] Rock fragments are unattached pieces of rock 2 mm in diameter or larger. Content is by measured volume.
[c] Permitted only where laboratory analysis provides evidence of percent fines required.
USDA Soil Texture Abbreviations:

COS = Coarse Sand	S = Sand	LCOS = Loamy Coarse Sand
LS = Loamy Sand	LFS = Loamy Fine Sand	LVFS = Loamy Very Fine Sand
COSL = Coarse Sandy Loam	SL = Sandy Loam	FSL = Fine Sandy Loam
VFSL = Very Fine Sandy Loam	L = Loam	SIL = Silt Loam
SI = Silt	SCL = Sandy Clay Loam	SICL = Silty Clay Loam
CL = Clay Loam	SC = Sandy Clay	SIC = Silty Clay
C = Clay		

(c) *Hydraulic application rates.* The maximum hydraulic application rate for stormwater and clearwater subsurface infiltration plumbing systems shall be in accordance with one of the following methods.

1. The maximum hydraulic application rate shall be determined by soil analysis in accordance with sub. (2)(b) and Table 82.365-2.

2. The maximum hydraulic application rate shall be determined by field measurement using a nationally-accepted method and the correction factor as determined using Table 82.365-3. To determine the maximum hydraulic application rate, the measured infiltration rate at the infiltrative surface shall be divided by the correction factor as listed in Table 82.365-3.

Table 82.365-2
DESIGN INFILTRATION RATES FOR SOIL TEXTURES RECEIVING STORMWATER

Soil Texture [a]	Design Infiltration Rate Without Measurement inches/hour [b]
Coarse sand or coarser	3.60
Loamy coarse sand	3.60
Sand	3.60
Loamy sand	1.63
Sandy loam	0.50
Loam	0.24
Silt loam	0.13
Sandy clay loam	0.11
Clay loam	0.03
Silty Clay loam	0.04 [c]
Sandy clay	0.04
Silty clay	0.07
Clay	0.07

[a] Use sandy loam design infiltration rates for fine sand, loamy fine sand, very fine sand, and loamy fine sand soil textures.

[b] Infiltration rates represent the lowest value for each textural class presented; based on Rawls et al., 1998 [Use of Soil Texture, Bulk Density and Slope of Water Retention Curve to Predict Saturated Hydraulic Conductivity, ASAE, Vol. 41(2), pp. 983-988].

[c] Infiltration rate is an average, based on Rawls et al., 1982 (Estimation of Soil Water Properties, Transactions of the American Society of Agricultural Engineers Vol. 25, No. 5 pp. 1316 –1320 and 1328) and Clapp & Hornberger, 1978 (Empirical equations for some hydraulic properties. Water Resources Research 14:601-604).

Table 82.365-3
TOTAL CORRECTION FACTORS DIVIDED INTO MEASURED INFILTRATION RATES

Ratio of Design Infiltration Rates [a]	Correction Factor
1	2.5
1.1 to 4.0	3.5
4.1 to 8.0	4.5
8.1 to 16.0	6.5
16.1 or greater	8.5

[a] Ratio is determined by dividing the design infiltration rate from Table 82.365-2 for the textural classification at the bottom of the infiltration device by the design infiltration rate from Table 82.365-2 for the textural classification of the least permeable soil horizon. The least permeable soil horizon used for the ratio should be within five feet of the bottom of the device or to the depth of the limiting layer.

(d) *Groundwater mounding.* Groundwater mounding consideration shall be included in the design of any stormwater and clearwater subsurface infiltration plumbing system that has a width that exceeds 15 feet and a depth to the estimated highest groundwater elevation.

Note: An acceptable model is provided by the USGS, webpage: http://water.usgs.gov/ogw/techniques.html.

(e) *Drain down time.* 1. Stormwater and clearwater subsurface infiltration plumbing systems shall be designed to drain within 72 hours after a storm event.

2. By design, ground surface ponding shall drain within 24 hours after a storm event.

(f) *Setbacks*. 1. Stormwater and clearwater subsurface infiltration plumbing systems shall be located as provided in Table 82.365-4, except for irrigation systems.

Table 82.365-4
HORIZONTAL SETBACK PARAMETERS BY PHYSICAL FEATURE

Physical Feature	Setback Parameters in feet
Building	10
Holding tank, stormwater collection tank	10
POWTS dispersal component	5
POWTS holding or treatment component	10
Property line	5
Swimming pool, in ground	15

2. All stormwater and clearwater subsurface infiltration plumbing systems shall be separated from water wells by the applicable separation distances contained in chs. NR 811 and 812 or as otherwise approved by the department of natural resources.

Note: See Appendix A-82.30 (11) (d) for material reprinted from ss. NR 811.16 (4) (d) and 812.08. Section NR 811.16 (4) (d) or 812.08 may have additional setback requirements.

(4) INSTALLATION. (a) *Orientation.* Except for subsurface irrigation systems, all of the following shall apply:

1. The longest dimension of a stormwater or clearwater subsurface infiltration plumbing system consisting in part of in situ soil shall be oriented along the surface contour of the site location, unless otherwise approved by the department.

2. The infiltrative surface of a stormwater or clearwater subsurface infiltration plumbing system consisting in part of in situ soil and located below the surface of the original grade shall be level.

(b) *Other requirements.* 1. A stormwater or clearwater subsurface infiltration plumbing system consisting in part of in situ soil may not be installed if the soil is frozen at the infiltrative surface.

2. Snow cover shall be removed before excavating or installing a stormwater or clearwater system component consisting in part of in situ soil.

3. For a stormwater or clearwater subsurface infiltration plumbing system consisting in part of in situ soil, the soil moisture content shall be evaluated immediately prior to installation of the component. If the soil evaluation at the infiltrative surface results in the sample capable of being rolled into a ¼ –inch wire, the installation may not proceed.

Note: To accomplish a field test for soil wetness, a soil sample the size of one's palm may be rolled to form at least a ¼-inch wire.

4. All vessels and pipes of a stormwater or clearwater subsurface infiltration plumbing system shall be bedded in accordance with a product approval under s. Comm 84.10 or a plan approval under s. Comm 82.20.

(5) OPERATION AND MAINTENANCE. (a) *General.* Operation and maintenance shall be performed in accordance with the operation and maintenance plan submitted with the stormwater and clearwater subsurface infiltration plumbing system design and s. Comm 82.36 (13), where applicable.

(b) *Prohibited substance.* 1. Except as provided in subd. 2., no substance shall be discharged into a stormwater or clearwater subsurface infiltration plumbing system that results in exceeding the enforcement standards and preventive action limits specified in ch. NR 140 Tables 1 and 2 at a point of standards application, pursuant to s. 160.21 (2), Stats.

Note: For groundwater standard limits on various substances, refer to ch. NR 140 Table 1.

2. Pursuant to s. 160.19 (2) (a), Stats., the department has determined that it is not technically or economically feasible to require that a stormwater or clearwater subsurface infiltration plumbing system treat wastewater to comply with the preventive action limit for chloride specified in ch. NR 140 Table 2, as existed on June 1, 1998.

Note: Section 160.19 (2) (a), Stats., reads: "Each regulatory agency shall promulgate rules which define design and management practice criteria for facilities, activities and practices affecting groundwater which are designed, to the extent technically and economically feasible, to minimize the level of substances in groundwater and to maintain compliance by these facilities, activities and practices with preventive action limits, unless compliance with the preventive action limits is not technically and economically feasible."

3. Pursuant to s. 160.21 (2), Stats., the point of standards application relative to the performance of stormwater and clearwater subsurface infiltration plumbing systems is any of the following:

a. Any point of present groundwater use for potable water supply.

b. Any point beyond the boundary of the property on which the facility, practice or activity is located.

(c) *Deleterious substance.* Substances deleterious to a stormwater or clearwater subsurface infiltration plumbing system shall be intercepted, diluted or treated in accordance with s. Comm 82.34 prior to the substance discharging into a stormwater or clearwater infiltration system

SECTION 14. Comm 82.37 (1) (c) Note is repealed and recreated to read:

Comm 82.37 (1) (c) Note: For a listing of agencies acceptable to the department, see Appendix A-84.11.

SECTION 15. Comm 82.37 (2) (a) Note is created to read:

Comm 82.37 (2) (a) Note: See Appendix A-82.37 (2) for further explanatory material.

SECTION 16. Comm 82.38 (3) (a) Table 82.38-1 is amended to read:

Table 82.38 – 1

ALLOWABLE DISCHARGE POINTS BY FIXTURE OR SPECIFIC USES

	Allowable Discharge Points					
Use or Fixture	**POWTS** [a]	**Municipal Sanitary Sewer**	**Municipal Storm Sewer**	**Ground Surface**	**Combined Sanitary-Storm Sewer**	**Subsurface Dispersal** [i]
1. Cross connection control device or assembly [see s. Comm 82.33 (9) (k)]	X	X		X [b, c, e]	X	
2. Domestic wastewater	X	X			X	
3. Condensate from high efficiency furnace or water heater	X	X			X	
4. Drinking fountain	X	X	X	X [b]	X	X [d]
5. Elevator pit drain [see s. Comm 82.33 (9) (f)]			X	X [b]	X	X [d]
6. Enclosed public parking levels	X	X		X [b]	X	X [d]
7. Industrial wastewater [h]	X [f]	X			X	
8. Municipal well pump house floor drain and sink	X	X		X [b]	X	X [d]
9. One- and 2-family garage floor area [see s. Comm 82.34 (4) (b)]	X	X		X [b]	X	
10. Storm water, groundwater and clear water	X	X [g]	X [c]	X [b]	X	X [d]
11. Swimming pool or wading pool-- diatomaceous earth filter backwash	X	X			X	
12. Swimming pool or wading pool-- drain wastewater	X	X [b]	X [b,c]	X [b,c]	X [b]	X [d]
13. Swimming pool or wading pool-- sand filter backwash	X	X [b]	X [b,c]	X [b,c]	X [b]	X [d]
14. Water heater temperature and pressure relief valve [see s. Comm 82.40 (5)]	X	X	X	X [b]	X	X [d]
15. Wastewater from water treatment device	X	X [g]	X [c]	X [b,c]	X	X [d]
16. Whirlpool backwash drain and wastewater	X	X	X [c]	X [b,c]	X	
17. Discharges not specifically listed above	Contact the department					

[a] Allowed when the POWTS is designed to include designated wastewater.

[b] Unless prohibited by local municipality and when no nuisance is created.

[c] A discharge permit may be required by the department of natural resources.

[d] ~~For public buildings or facilities, allowed after receiving plan approval from the department. See also s. Comm 82.20.~~

[e] Allowed for exterior installation and when no sanitary sewer is in the building.

[f] Refer to the department of natural resources for discharge regulations.
[g] Fifty gpd ~~clear water~~ clearwater ~~as specified under s. Comm 82.36 (3) (b)~~.
[h] The department of natural resources may require WPDES permits for industrial discharges and may allow other options.
[i] Subsurface dispersal must comply with s. Comm 82.365.

SECTION 17a. Comm 82.40 (3) (e) 2. b. is amended to read:

Comm 82.40 (3) (e) 2. b. Sections ~~2-3 (b), 2-3 (d), 3-6, 4-1.4.1, 4-1.4.2, 4-4.2 Exception No. 2 (h), 4-6, 5-3.2, 5-4.3 and 5-5~~ 6.2(2), 6.3(5), 7.6, 8.1.3.1, 8.1.3.2, 8.1.3.1.3, 8.1.3.2, 8.1.3.3, 8.4.3.3(10), and 8.6, of NFPA 13D do not apply in Wisconsin.

SECTION 17b. Comm 82.40 (3) (e) 2. c. is repealed.

SECTION 17c. Comm 82.40 (4) (a) 2. b. Note is created to read:

Comm 82.40 (4) (a) 2. b. **Note:** See Appendix A-82.40 (4) for further explanatory material.

SECTION 18. Comm 82.40 Table 82.40-9 is repealed and recreated to read:

Table 82.40-9
MAXIMUM ALLOWABLE LOAD FOR CROSSLINKED POLYETHYLENE (PEX) TUBING, ASTM F876 and F877; (C=150)

Pressure Loss Due to Friction (in lbs. per 100 ft. of Length)	Pipe Diameter (in inches)																				
	1/2"			5/8"			3/4"			1"			1 1/4"			1 1/2"			2"		
		WSFU			WSFU			WSFU			WSFU			WSFU			WSFU			WSFU	
	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT
0.5	0.5	-	0.5	0.5	-	0.5	1.0	-	1.0	2.5	-	2.5	4.0	-	4.0	6.5	-	8.0	13.5	4.5	19.0
1	0.5	-	0.5	1.0	-	1.0	1.5	-	1.5	3.5	-	3.5	6.0	-	7.0	9.5	-	12.5	19.5	6.5	29.0
2	1.0	-	1.0	1.5	-	1.5	2.5	-	2.5	5.0	-	6.0	9.0	-	11.5	14.0	4.5	20.0	28.0	11.0	50.0
3	1.0	-	1.0	2.0	-	2.0	3.0	-	3.0	6.5	-	8.0	11.0	4.0	15.0	17.5	5.5	25.5	36.0	22.0	73.0
4	1.5	-	1.5	2.5	-	2.5	4.0	-	4.0	7.5	-	9.5	13.0	4.5	18.0	20.5	6.5	31.0	42.0	33.0	100
5	1.5	-	1.5	3.0	-	3.0	4.5	-	5.0	8.5	-	10.5	15.0	5.0	21.5	23.0	7.5	37.0	47.0	42.0	116
6	2.0	-	2.0	3.0	-	3.0	5.0	-	6.0	9.5	-	12.5	16.5	5.5	24.0	25.0	8.5	42.0	51.0	53.0	135
7	2.0	-	2.0	3.5	-	3.5	5.5	-	6.5	10.5	4.0	14.0	18.0	6.0	26.5	28.0	11.0	50.0	NP		
8	2.0	-	2.0	3.5	-	3.5	5.5	-	6.5	11.0	4.0	15.0	19.0	6.0	28.0	30.0	13.5	55.0			
9	2.5	-	2.5	4.0	-	4.0	6.0	-	7.0	12.0	4.0	16.5	20.5	6.5	31.0	NP					
10	2.5	-	2.5	4.0	-	4.0	6.5	-	8.0	12.5	4.5	17.5	21.5	7.0	34.0						
11	2.5	-	2.5	4.5	-	5.0	7.0	-	9.0	13.5	4.5	19.0	NP								
12	2.5	-	2.5	4.5	-	5.0	7.0	-	9.0	14.0	4.5	20.0									
13	3.0	-	3.0	5.0	-	6.0	7.5	-	9.5	14.5	4.5	20.5									
14	3.0	-	3.0	5.0	-	6.0	8.0	-	10.0	NP											
15	3.0	-	3.0	5.5	-	6.5	8.0	-	10.0												
16	3.0	-	3.0	5.5	-	6.5	8.5	-	10.5												
17	3.5	-	3.5	5.5	-	6.5	8.5	-	11.0												
18	3.5	-	3.5	6.0	-	7.0	NP														
19	3.5	-	3.5	6.0	-	7.0															
20	3.5	-	3.5	6.0	-	7.5															
21	4.0	-	4.0	NP																	
	NP																				

Note: WSFU means water supply fixture units.
GPM means gallons per minute.
FM means predominately flushometer type water closets or syphon jet urinals.
FT means predominately flush tank type water closets or wash down urinals.
NP means - not permitted, velocities exceed 8 feet per second.
For using this table, round the calculated pressure loss due to friction to the next higher number shown.
Comm 82.40 (7) (f) and (g) specifies minimum sizes for water distribution piping.

SECTION 18a. Comm 82.40 (8) (i) 4. is created to read:

Comm 82.40 (8) (i) 4. New or repaired combination water services or combination private water mains shall be flushed and disinfected prior to use in accordance with NFPA 24.

SECTION 18b. Comm 82.41 Tables 82.41-1 (partial) and Table 82.41-2 (partial) are amended to read:

Table 82.41-1 (partial)
ACCEPTABLE CROSS CONNECTION CONTROL METHODS OR ASSEMBLIES FOR SPECIFIC APPLICATIONS

Methods or Assemblies of Cross Connection Control (Standard)	Situations and Conditions							
	Backpressure				Backsiphonage			
	Low Hazard		High Hazard		Low Hazard		High Hazard	
	Continuous	Noncontinuous	Continuous	Noncontinuous	Continuous	Noncontinuous	Continuous	Noncontinuous
	Pressure		Pressure		Pressure		Pressure	
Reduced Pressure Principle Backflow ~~Preventer~~ Preventers And Reduced Pressure Fire Protection Principle Backflow Preventers (ASSE 1013)	X	X	X	X	X	X	X	X

Table 82.41-2 (partial)
ACCEPTABLE CROSS CONNECTION CONTROL METHODS OR ASSEMBLIES FOR SPECIFIC APPLICATIONS

Methods or Assemblies of Cross Connection Control (Standard)	Types of Application or Use
Reduced Pressure Detector Fire Prevention Backflow ~~Preventer~~ Prevention Assemblies (ASSE 1047)	Automatic fire sprinkler systems

SECTION 18c. Comm 82.41 (2), and (3) (a) 1. and (b) 7. are amended to read:

Comm 82.41 (2) MATERIALS. (a) All devices, assemblies and mechanisms intended to protect ~~potable~~ water supplies relative to cross connection or backflow shall be of a type recognized and approved in accordance with ch. Comm 84 and as described in sub. (4).

(b) All methods including barometric loops and air gaps intended to protect ~~potable~~ water supplies relative to cross connection or backflow shall be constructed of materials suitable for water supply systems in accordance with ch. Comm 84.

(3) (a) *Types of cross connection control.* 1. ~~Potable water~~ Water supply systems shall be protected against contamination due to cross connections or backflow conditions by one of the methods or devices specified in Table 82.41-1 depending upon the situation or Table 82.41-2 depending upon the specific application or use, and the limitations specified in sub. (4).

(b) 7. A cross connection situation shall not be considered to exist ~~for an automatic fire sprinkler system serving~~ when a multipurpose piping system serves a one- or 2- family dwelling provided the sprinkler system is constructed of materials and joints suitable for water distribution systems as specified in ss. Comm 84.30 (4) (e) and 84.40, respectively ~~and the sprinkler system is supplied with only potable water~~.

SECTION 18d. Comm 82.41 (3) (b) 4. d. is created to read:

Comm 82.41 (3) (b) 4. d. A chemical pot-feeder or automatic chemical feeder is installed to serve a boiler, cooling tower or chilled water system.

SECTION 18e. Comm 82.50 Table 82.50-1 (partial) is amended to read:

TABLE 82.50-1 (partial)
SPOUTS AND ACTIONS REQUIRED IN HEALTH CARE AND RELATED FACILITIES

Fixture Location	Type of Spout		Type of Action		
	Standard	Gooseneck or provide a 5-inch clearance	Hand	Wrist	Foot, Knee or Electronic Sensor
DIAGNOSTIC AND TREATMENT					
Lavatory in autopsy shower room		X	X	X	X
Laboratory		X	X	X	X

SECTION 18f. Comm 82.50 (3) (b) 5. is amended to read:

Comm 82.50 (3) (b) 5. Water provided to patient showers, therapeutic equipment and all types of baths shall be installed with control valves which automatically regulate the temperature of the water supply to the fixture fitting outlet within a temperature range of 110°F to 115°F. Such control valves shall automatically reduce flow to ~~0.25~~ 0.5 gpm or less when the water supply to the fitting outlet exceeds 115°F.

SECTION 19. Comm 82.51 (3) (c) Note is created to read:

Comm 82.51 (3) (c) **Note:** See Appendix A-82.51 (3) for further explanatory material.

SECTION 20. Comm 82.70 Table 82.70-1 is amended to read:

Table 82.70-1
PLUMBING TREATMENT STANDARDS

Intended Use	Plumbing Treatment Standards [e]
1. Drinking, cooking, food processing, preparation and cleaning, pharmaceutical processing, and medical uses	NR 811 and 812 approved sources
2. Personal hygiene, bathing, and showering, clothes washing~~, etc.~~	NR 811 and 812 approved sources
3. Automatic fire protection systems	As acceptable by local authority
4. Swimming pool makeup water	NR 811 and 812 approved sources ~~to private water supplies~~
5. Swimming pool fill water	~~Pool fill requirements in accordance with ch.~~ HFS 172 requirements
6. Once through cooling water [b]	pH 6 - 9 ~~[e]~~ [b] ≤ 30 mg/L BOD_5 ≤ 30 mg/L TSS ~~<~~ ≤ 200 fecal coliform cfu/100 mL ≥ 1 mg/L and < 10 mg/L free chlorine residual ~~[e]~~ [b]
7. Subsurface ~~dispersal/~~ infiltration and irrigation, using reuse as the source [b, ~~d, e~~ c]	≤ ~~30~~ 15 mg/L oil and grease ≤ 30 mg/L BOD_5 ≤ ~~150~~ 35 mg/L TSS ~~<~~ ≤ 200 fecal coliform cfu/100 mL [d]
8. Subsurface infiltration and irrigation, using stormwater as the source [c]	< 15 mg/L oil and grease < 60 mg/L TSS
~~8~~ 9. Surface or spray irrigation ~~of any food crop, including crops eaten raw, non-commercial only [a, e]~~ using stormwater and clearwater as the source [c]	~~pH 6 - 9 [e]~~ ≤ 10 mg/L BOD_5 ≤ 5 mg/L TSS ~~no detectable fecal coliform/100 mL~~ ~~≥ 1 mg/L chlorine residual [e]~~
~~9~~ 10. Surface irrigation except food crops, vehicle washing, toilet and urinal flushing, air conditioning, ~~and other urban uses with similar human access or exposure to the water~~ soil compaction, dust control, washing aggregate and making concrete ~~[d, e]~~ [a, c,	pH 6 - 9 ~~[e]~~ [b] ≤ 10 mg/L BOD_5 ≤ 5 mg/L TSS No detectable fecal coliform cfu/100 mL ≥ 1 mg/L and < 10 mg/L free chlorine residual ~~[e]~~ [b]

Table 82.70-1 (continued)
PLUMBING TREATMENT STANDARDS

Intended Use	Plumbing Treatment Standards [f]
~~10. Soil compaction, dust control, washing aggregate and making concrete~~	~~≤ 30 mg/L BOD5~~ ~~≤ 30 mg/L TSS~~ ~~≤ 200 fecal coliform/100 mL~~ ~~≥ 1 mg/L chlorine residual [e]~~
~~11. Irrigation of sod farms, silviculture sites and other areas where human access is prohibited or restricted [e]~~	~~pH 6 – 9 [e]~~ ~~≤ 30 mg/L BOD5~~ ~~≤ 30 mg/L TSS~~ ~~≤ 200 fecal coliform/100 mL~~ ~~≥ 1 mg/L chlorine residual [e]~~
~~12~~11. Uses not specifically listed above	Contact department for ~~approval~~ standards

[a] Refer to the department of agriculture, trade and consumer protection for commercial use.
~~[b] Refer to ch. Comm 83 for domestic wastewater treatment requirements.~~
[e] [b] Applies only to wastewater treatment devices for reuse systems. Other equivalent disinfection methods may be approved by the department.
~~[d] Stormwater collected from parking lots and industrial sites may not be infiltrated prior to pretreatment.~~
[e] [c] These requirements do not apply to the treatment of industrial wastewater or other wastewater discharges that are subject to a WPDES permit issued by the department of natural resources.
[d] A 12-inch minimum separation of medium sand or finer material above high groundwater or bedrock.
[e] Applies to reuse not stormwater use.
[f] For stormwater, the plumbing treatment standards are based on an annual average. Evaluation of research to prove compliance with this table is based on the geometric mean of the data acceptable to the department or an equivalent method.

SECTION 21a. Comm 84.10 Table 84.10 line 9. is repealed.

SECTION 21b. Comm 84.11 Table 84.11 (partial) is amended to read:

Table 84.11
DEVICE LISTINGS

Device	Referenced Standard
Reduced Pressure Detector ~~Assembly~~ Fire Protection, Backflow ~~Preventers~~ Prevention Assemblies	ASSE 1047
Reduced Pressure Principle Backflow ~~Preventer~~ Preventers and Reduced Pressure Fire Protection Principle Backflow Preventers	ASSE 1013

SECTION 22a. Comm 84.20 (5) (p) 1. is amended to read:

Comm 84.20 (5) (p) *Water heaters.* 1. Listed equipment. All water heaters shall bear the label of a listing agency ~~approved by~~ acceptable to the department. ~~Listing agencies approved by the department shall include:~~

~~a. Underwriters Laboratories, Inc.;~~

~~b. American Gas Association;~~

~~c. American Society of Mechanical Engineers; and~~

~~d. ETL Testing Laboratories, Inc.~~

Note: See Appendix A-84.11 for listing agencies acceptable to the department.

SECTION 22b. Comm 84.30 (4) (d) 3. is created to read:

Comm 84.30 (4) (d) 3. Materials for combination water services and combination private water mains shall comply with NFPA 24 and the provisions specified in par. (d).

SECTION 22c. Comm 84.30 (5) (c) 8. and Note, and 15. are amended to read:

Comm 84.30 (5) (c) 8. Reduced pressure ~~principle~~ backflow preventers and reduced pressure ~~detector~~ fire protection principle backflow preventers, or backflow preventers, reduced pressure principle type (RP) shall conform with ASSE 1013 or CAN/CSA B64.4.

Note: Reduced pressure ~~principle~~ backflow preventers and reduced pressure detector fire protection backflow preventers are not permitted for cross connection control.

15. Reduced pressure detector fire protection, backflow ~~preventers~~ prevention assemblies shall conform to ASSE 1047.

SECTION 23. Comm 84.30 (6) (h) (intro.), (i) (intro.) and (j) (intro.) are amended to read:

Comm 84.30 (6) (h) *Leaching chambers.* Leaching chambers for distribution cell components of POWTS or stormwater subsurface infiltration systems shall meet all of the following requirements:

(i) *Stone aggregate.* Stone aggregate which is used as a filtering medium or to create a distribution cell in a treatment or dispersal component of a POWTS or stormwater subsurface infiltration system shall meet all of the following requirements:

(j) *Sand.* Sand which is ~~used~~ placed as a filtering medium in a treatment or distribution cell of a POWTS or stormwater subsurface infiltration system shall conform to ASTM Standard C33 for fine aggregate.

SECTION 24. Comm 84.30 (6) (k) is created to read:

Comm 84.30 (6) (k) *Synthetic aggregate.* Synthetic aggregate that is used as a filtering medium or to create a distribution cell in a treatment or dispersal component of a POWTS or stormwater subsurface infiltration system shall meet all of the following requirements:

1. Be made from inert materials.

2. Be ½ inch to 2½ inches in size.

3. Be made of material that will not contaminate groundwater.

4. Be recognized by the manufacturer for use as a filtering media or a material to create a distribution cell.

SECTION 25. Comm 85.10 (1) is amended to read:

Comm 85.10 Qualifications. (1) SOIL EVALUATION. A soil evaluation for treatment or dispersal of wastewater, treated wastewater, final effluent or nonwater−carried human wastes regulated by chs. Comm 83 and 91 shall be performed by an individual who is a certified soil tester. A soil evaluation for the treatment or dispersal of stormwater regulated under ch. Comm 82 shall be performed by an individual who is either a certified soil tester or one who holds a professional soil scientist license under ch. GHSS 4.

(end)

* *

EFFECTIVE DATE

Pursuant to s. 227.22 (2) (intro.), Stats., these rules shall take effect on the first day of the month following publication in the Wisconsin Administrative Register.

* *