MEMORANDUM

TO: Board of Building Appeals Members

FROM: William J. Heniff, AICP, Community Development Director

DATE: September 9, 2015

SUBJECT: **BUILDING CODE AMENDMENTS – CHAPTER 150 OF THE VILLAGE CODE (PLUMBING)**

Earlier this year, Community Development and Fire completed a review of selected sections of the Village of Lombard's Building Code, Chapter 150 of the Village Code. With completion and adoption of these amendments, staff is now proceeding with the attached amendments to the local plumbing provisions set forth with the Village Code.

Local Amendment Code Changes - IDPH

The proposed amendments are to address observational issues, changes in the plumbing industry and to address interpretations set forth by the Illinois Department of Public Health (IDPH) as it pertains to the State Plumbing Code. The state issued an opinion last year that only the State, through the IDPH, can promulgate rules pertaining to plumbing and that municipalities cannot adopt any provisions that are either more or less restrictive than their regulations. If amendments are sought, they must be approved by the IDPH and they would only be approved based upon documentation and evidence that states that the provisions are of general applicability and not for specific municipalities. IDPH has sent notifications to licensed plumbers that municipalities do not have the authority to enact any such regulations beyond the IDPH and if they are, to contact the state. They have subsequently amended their position to allow for modifications to permitted material type, subject to their review and approval.

While there are concerns pertaining to the actual promulgation of such codes by the state in the past, staff has also looked at the overall state provisions to determine the significant issues and differences between the state code and local codes. As discussed at the last BOBA meeting, staff is advancing code amendments to providing a level of standardization and uniformity with accepted practices. National trends in plumbing regulations also suggest that the Village may want to move away from our local code provisions to a large extent. Staff finds that most architects, design teams and contractors work in multiple municipalities. Having our code reflect standard accepted practices adopted through the State Plumbing Code and elsewhere, we anticipate the review and approval processes to be simpler and will benefit the inspection approval process. This effort also is intended to remove elements that are desired, but not required, to ensure proper installation and/or utilization of the plumbing system.

As part of the plumbing code review, staff had experts in PEX tubing and CPVC give demonstrations regarding their products to demonstrate that inclusion of the material will not adversely affect performance. The end result is that staff supports adopting the state code essentially as-is, with incorporation of other items that are not covered within the State Plumbing Code within our general building code regulations.

There are three items staff requests that should remain within the local code that are not adequately addressed by the State Plumbing Code. This includes a requirement for K copper for water services, establishment and requirements for suds zones, and water meter reader information. In order for these to be approved, the Village will forward these amendments to the state for their consideration and approval prior to formal adoption by the Village Board.

An added new section includes areas not covered by the State, including stormwater roof drainage provisions. This will be incorporated into a new Section 150.055 accordingly. Staff has also modified Section 150.053 pertaining to water saving plumbing fixtures, which was a mandate set forward by the Illinois Department of Natural Resources and which has been previously reviewed by the Public Works Committee, as noted in the attached memorandum and correspondence.

ACTION REQUESTED

Staff seeks the input regarding the proposed amendments at the scheduled BOBA meeting and recommends approval of the amendments to Chapter 150 as it pertaining to the plumbing code provisions.

MEMORANDUM

To: Chairperson and Public Works Committee Members

Through: Carl S. Goldsmith, Director of Public Works

From: Brian M. Jack, Utilities Superintendent

Date: July 1, 2015

Subject: **UPDATE of Ordinance** § 51.25 - Restrictions on water use; meters and water saving plumbing fixtures

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Background

The Village receives finished potable water from Lake Michigan via the City of Chicago and the DuPage Water Commission. The Illinois Department of Natural Resources (IDNR) regulates the amount of water each Lake Michigan user consumes based on an average daily flow as part of the Lake Michigan Water Allocation Program. This program was developed to manage Illinois' diversion of water from Lake Michigan in response to a 1967 Supreme Court Decree in order to protect Lake Michigan in regards to water quality and lake levels for ship navigation.

All water allocation permittees are required to perform annual water use audits and submit an annual water audit form (LMO-2) to the IDNR. The annual water audit details the amount of water used, sold, and lost (water main leakage, meter inaccuracies, or unaccounted for flows) by the permittee. The audit allows for a maximum of an 8% loss of water or unaccounted for flow as mandated by the IDNR. This percentage represents the water accounted for via residential, commercial, industrial, and municipal water meters (Village authorized consumption) to unaccounted for flows. Historically, the Village of Lombard has averaged a 6% water loss since 1992.

The Village is also required by the Lake Michigan Water Allocation Rules and Regulations Section 3730.307, to have a language in a Village Ordinance regarding water conservation practices. This section has been amended, became final and effective on November 28, 2104 to modify two provisions regarding water conservation. Thus, the Village of Lombard is now required to amend and update its ordinances. The following is the current ordinance language with the added required language to meet the new Lake Michigan Water Allocation Rules and Regultions. Paragraph (F) will be reviewed by the Board of Building Appeals.

§ 51.25 - Restrictions on water use; meters and water saving plumbing fixtures.

(A) No person shall use water from the water distribution system of the village **on consecutive days nor for a six hour period in the middle of the day between 10:00 am and 4:00 pm when evapotranspiration is at its highest** for the sprinkling, watering, or irrigation of shrubbery, trees, lawns, grass, ground cover, plants, vines, gardens, flowers, or other vegetation except that persons at odd-numbered street addresses may do so only on odd-numbered dates and persons at even-numbered street addresses may do so only on even-numbered dates and except that persons whose property has been newly sodded or newly seeded may use water from the water distribution system of the village on an unrestricted basis, subject to emergency regulations as defined in subsection (B) of this section, for watering that property for a 30 day period immediately following such sodding or seeding, after which time the restrictions of this section shall apply. **All new/replacement irrigation sprinkler systems shall be equipped with a WaterSense labeled irrigation controller and shall be in compliance with Section 2.5(g) of the Illinois Plumbing License Law [225 ILCS 320].**

(F) ~~The following~~ **W**ater saving plumbing fixtures shall be required **and labeled as a WaterSense product for new and replacement fixtures**. **Plumbing fixtures shall follow Village of Lombard Code ARTICLE VI. - ILLINOIS STATE PLUMBING CODE; § 150.050 - Adoption by reference; amendments.** ~~In all new construction and in all repairs and replacement of fixtures or trim, only fixtures and trim not exceeding the following flow rates or water usage shall be installed (ratings are based on a pressure at the fixture of 40 to 50 pounds per square inch):~~

~~Water closets, tank type~~	~~3.5 gal. per flush~~
~~Water closets, flushometer type~~	~~3.0 gal. per flush~~
~~Urinals, tank type~~	~~3.0 gal. per flush~~
~~Urinals, flushometer type~~	~~3.0 gal. per flush~~
~~Shower heads~~	~~3.0 gal. per minute~~
~~Lavatory, sink faucets~~	~~3.0 gal. per minute~~

Paragraph (4) of Village Enclosed with this memo is the notification from the Illinois Department of Natural Resources stating the requirement and guidelines for this amendment to the Village of Lombard Ordinances.

Recommendation

Staff recommends that the Public Works Committee approves this amendment to Village of Lombard Ordinance: § 51.25 - Restrictions on water use; meters and water saving plumbing fixtures. Once approved, staff will present the proposed amendment to the Board of Trustees for adoption at their July 14, 2015 meeting.

04-03-15A08:56 RCVD

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Illinois Department of
Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
www.dnr.illinois.gov

Bruce Rauner, Governor
Wayne A. Rosenthal, Director

March 31, 2015

To: Lake Michigan Water Allocation Permittees

From: Daniel Injerd, Chief, Lake Michigan Management

Subject: Updating Local Ordinances to be Consistent with the New Water Allocation Rules

The amendments to the Lake Michigan Water Allocation Rules and Regulations became final and effective on November 18, 2014. They have been posted to our website: http://www.dnr.illinois.gov/WaterResources/Pages/LakeMichiganWaterAllocation.aspx and can be viewed or downloaded as a pdf file so that you can print a copy for your use.

Throughout the rather long and contemplative process to update the Department's administrative rules governing the Lake Michigan water allocation program, our goal has been to have these rules support our collective efforts to manage and conserve our Lake Michigan water resource.

The updated Lake Michigan Water Allocation Rules and Regulations made several changes to Section 3730.307 Conservation Practices and Other Permit Conditions. Section 3730.307(c) contains the list of conservation practices that domestic permittees must adopt in an ordinance/building code as evidence of compliance. The updated rules modified two provisions, subparts 4 and 8, that will require domestic permittees to update their ordinances/building codes to be consistent with the new language. These provisions read as follows:

> 4) The adoption of ordinances requiring that new and replacement plumbing fixtures be a labeled WaterSense product, as specified by USEPA.
>
> 8) The adoption of ordinances that restrict non-essential outside water uses to prevent excessive, wasteful use. These shall provide that unrestricted lawn sprinkling will not be allowed from May 15 through September 15 of each year by requiring, as a minimum, that lawn sprinkling shall not occur on consecutive days nor shall any lawn sprinkling occur during at least a 6 hour period in the middle of the day

(i.e., 10 a.m. through 4 p.m., noon to 6 p.m.) when evapotranspiration is at its highest. New lawns (less than 3 months old) may be exempted from this provision. In addition, new/replacement sprinkler systems shall be equipped with a WaterSense labeled irrigation controller and shall be in compliance with Section 2.5(g) of the Illinois Plumbing License Law [225 ILCS 320].

The new language in Subpart 4 replaces flow limits on specific plumbing fixtures. WaterSense labeled plumbing products are readily available at all hardware/plumbing supply outlets, and have become the accepted standard nationwide.

The new language of Subpart 8 provides additional guidance for permittees to include in a lawn sprinkling ordinance.

All Lake Michigan water allocation permittees that are units of local government will need to submit their revised ordinances to the Department to demonstrate compliance with these two revised subparts. Revised ordinances should be submitted to the Department by September 30, 2015. If you have any questions please feel free to contact Cara Adkins. Revised ordinances can be submitted either electronically or as hard copy to:

Ms. Cara Noel Adkins

Illinois Department of Natural Resources

160 N. LaSalle St., Suite S-703

Chicago, IL 60601

312|814.8579

Cara.N.Adkins@illinois.gov

ILLINOIS STATE PLUMBING CODE

§ 150.050 ADOPTION BY REFERENCE; AMENDMENTS.

(A) The Illinois State Plumbing Code. There is hereby adopted a certain code known as the "Illinois State Plumbing Code, latest edition ad adopted by the Illinois Department of Health, for the purpose of prescribing regulations for plumbing fixtures, materials, and design and installation methods as minimum standards for plumbing in the Village of Lombard. Said "Illinois State Plumbing Code, latest edition" is hereby adopted by reference in its entirety, subject to those sections not adopted or amended pursuant to the provisions herein stated below of the Lombard Municipal Code.

(B) Amendments to the Illinois State Plumbing Code.

~~Page E-1, Section 890.510 (a)(5)~~
~~Grease Interceptors Required: Amend paragraph as follows: It is required that interceptors be located outside the building and be accessible for maintenance purposes except when expressly permitted to be installed in an alternative location by the authority having jurisdiction. Grease interceptors/traps shall be designed as to type and size in accordance with the Illinois Plumbing Code.~~

~~Page E-2 Section 890.510(C) add the following: All fixtures shall be trapped and vented before discharging into a grease interceptor.~~

~~Page E-2, Section 890.520~~
~~(a) Gasoline Oil and Flammable Liquids, Interceptors/Separators Required: Amend the first sentence by adding, Commercial vehicle storage or repair garages and gasoline stations with grease racks or pits, interior depressed truck docks and all facilities that have flammable waste…~~

~~Page E-2 Section 890.520(a)(1) Add the following: All fiberglass interceptors shall have a cast iron hum or an approved equal.~~

~~Page E-5, Section 890.550~~
~~Backwater Valves Sanitary System and Storm System: Add the following: It is recommended that all building drains shall have no openings for fixture drains below the outside grade of the building, such fixture drains where installed, shall drain into an ejector or sump with an automatic mechanical pump. Also see Section 890.1360, Page J-6.~~

~~Page E1-2 Appendix E Illustration B Provide a cleanout outside of catch basin.~~

~~Page F-9, Section 890.710~~
~~Food Waste Grinders, Subsection (b) Commercial: Amend subsection as follows: Food Waste Grinders are not permitted in commercial occupancies.~~

~~Page F-12 Section 890.800~~

~~Special equipment~~

~~All commercial car, automobile or truck washing equipment shall conform to the Federal requirements for water conservation. Also see Section 890.520(d).~~

~~Page I-1 Section 890.1130 add the following line: See the Lombard cross connection control ordinance.~~

~~Page I-11 Section 890.1150 add sub section (d)~~

~~Potable water supply pipe for commercial buildings shall be connected to the main outside the building with its own control valve in the public right of way. Also see Section 890.1130(a).~~

~~Page I-15 890.1200(a) Change the minimum water service from ¾ inch to 1 inch.~~

~~Page J-4, Section 890.1340~~
~~Determination of Sizes for Drainage System, (b) Minimum Size of Building Drain, Horizontal Branch (4) Amend to read as follows: No portion of the drainage system installed underground shall be less than four (4) inches in diameter, except 2" horizontal branch waste lines, maximum 5' 0" in length from lavatories and showers, can be installed and connected to 4" waste lines.~~

~~Appendix A Table A.~~
~~Plumbing Materials, Use Restriction and Applicable Standards to be changed as follows: All structure requiring a construction permit: Plumbing Equipment/Material shall include ferrous pipe, fittings and valves and non-metallic/PVC schedule 40 pipe and fittings permitted for interior drain, waste and vent: six (6) inch minimum PVC SDR 26 for exterior underground (building sewer).~~

~~Page 3 Appendix A Table A (Waste and Vent)~~
~~Eliminate all material except: P.V.C. sch .40 A.S.T.M. 2665 A.S.T.M. 1785~~
~~Cast Iron (no hub or pour joint), or~~
~~M, L, types copper~~

~~Exception: Industrial or Process piping.~~

~~Page 5 Appendix A Table A (Sewer)~~
~~Eliminate all material except: P.V.C. sch. .40 or greater. A.S.T.M. 2665 A.S.T.M. 1785~~
~~Cast Iron~~
~~S.D.R. 26~~

Page 7 Appendix A Table A (Water Service)
Eliminate all material except: Type K copper
Ductile Iron

~~Page 9 Appendix A Table A (Water Distribution)~~
~~Eliminate all material except: Types L, M, or K type copper.~~

~~Exception: Reverse osmosis water~~

~~Page B-2 Section 890.230 All safe pans are to drain into a trapped and vented p-trap.~~

Page J 2 Section 890.1320 A 12' "suds zone" shall be installed at all commercial/multi-family buildings where a laundry stack is present. Suds zone shall tie in a minimum of 12' from closest fixture.

~~Page J-4 Section 890.1320 Change existing ordinance from 4" to 3" and insert exception all water closets and floor drains, hub drains and floor sinks are to be 4".~~

~~Page J-8 890.1370 Eliminate trap priming device.~~

~~Page J-3 890.1320 Insert: Eliminate the use of crosses for water closets, eliminate use of crosses for lavatory sinks unless sink has an accessible cleanout directly above or below crow.~~

~~Page I-14 890.1190 B Insert: All water meters shall have a full port ball valve directly before the meter. A ½ inch boiler drain shall be installed after meter and a second full port ball valve after drain down valve. All boiler drains shall have a vacuum release installed.~~

Page I-14 890.1190 B Insert: Remote reader to be installed by contractor at time of rough inspection. The remote reader wires to be installed in a pipe conduit flush to the outside wall and within one foot of the water meter.

~~Page I-18 890.1220 Insert: No water heater larger than 15 gallons shall be placed in a ceiling, or overhead unless it is on a landing and accessible by code approved stairs.~~

~~Page I-16 890.1210 Insert: A six gallon water heater shall service one sink only.~~

~~Page J-7 890.1370 Insert: All new construction buildings having a laundry room or rooms, shall have an accessible floor drain. All single family/multi family buildings where there has been alteration to the plumbing system in the laundry rooms, shall install an accessible floor drain where one is not already present and accessible.~~
~~(Ord. 6602, passed 4/7/11)~~

~~*INTERNATIONAL PLUMBING CODE—2009 EDITION*~~

~~§ 150.070 ADOPTION BY REFERENCE; AMENDMENTS.~~

~~(A) There is hereby adopted by the Village a~~
~~Certain code known as "The International Plumbing Code, 2009 Edition developed by International Code of Council is hereby adopted by reference. The terms and conditions of the 2009 Edition are hereby to be in full force and effect as adopted by the Village in its entirety and subject to any amendments made thereto. This is in addition to the current State adopted Plumbing Code, most restrictive to apply.~~

~~(B) The International Plumbing Code, 2009~~
~~Edition, adopted pursuant to division (A) above, is amended as follows:~~

~~101.1 Insert: The Village of Lombard~~

~~103.1 Delete: "Department of Plumbing Inspection" and insert "Building Division"~~

~~106.5.2 Insert: See the Village of Lombard Ordinances, Section 150.141. Permit Fees.~~

~~106.5.3 Fee Refunds: Delete entire Section and insert: See section 150.142 Division (B) for fees.~~

~~108.4 Insert: misdemeanor, $750.00, and 0 days.~~

~~108.5 Insert: $50.00 and $750.00.~~

~~109.0 Means or Appeal: Delete this Section entirely.~~

~~(Ord. 6710, passed 4/19/12)~~

150.053 The following water saving plumbing fixtures shall be required and labeled as a WaterSense product. In all new construction and in all repairs and replacement of fixtures or trim, only fixtures and trim not exceeding the following flow rates or water usage shall be installed (ratings are based on a pressure at the fixture of 40 to 50 pounds per square inch:

Water closets, tank type	1.28 gal. per flush
Water closets, flushometer type	1.5 gal. per flush
Urinals, tank type	1.0 gal. per flush
Urinals, flushometer type	0.5 gal. per flush
Shower heads	2.0 gal. per minute
Lavatory, sink faucets	1.5 gal. per minute

150.055 STORM WATER DRAINAGE FOR BUILDINGS

1101.1 Scope.
The provisions of this chapter shall govern the materials, design, construction and installation of storm drainage.

1101.2 Where required.
All roofs, paved areas, yards, courts and courtyards shall drain into a separate storm sewer system, or a combined sewer system, or to an approved place of disposal. For one- and two-family dwellings, and where approved, storm water is permitted to discharge onto flat areas, such as streets or lawns, provided that the storm water flows away from the building.

1101.3 Prohibited drainage.
Storm water shall not be drained into sewers intended for sewage only.
1101.4 Tests.
The conductors and the building storm drain shall be tested in accordance with Section 312 of the 2012 International Plumbing Code.

1101.5 Change in size.
The size of a drainage pipe shall not be reduced in the direction of flow.

1101.6 Fittings and connections.
All connections and changes in direction of the storm drainage system shall be made with approved drainage-type fittings in accordance with Table 706.3 of the International Plumbing Code. The fittings shall not obstruct or retard flow in the system.

1101.7 Roof design.
Roofs shall be designed for the maximum possible depth of water that will pond thereon as determined by the relative levels of roof deck and overflow weirs, scuppers, edges or serviceable drains in combination with the deflected structural elements. In determining the maximum possible depth of water, all primary roof drainage means shall be assumed to be blocked.

1101.8 Cleanouts required.
Cleanouts shall be installed in the storm drainage system and shall comply with the provisions of this code for sanitary drainage pipe cleanouts.

Exception: Subsurface drainage system.

1101.9 Backwater valves.
Storm drainage systems shall be provided with backwater valves as required for sanitary drainage systems in accordance with Section 715 of the 2012 International Plumbing Code.

1102 MATERIALS

1102.1 General.
The materials and methods utilized for the construction and installation of storm drainage systems shall comply with this section and the applicable provisions of Chapter 7 of the International Plumbing Code.

1102.2 Inside storm drainage conductors.
Inside storm drainage conductors installed above ground shall conform to one of the standards listed in Table 702.1 of the 2012 International Plumbing Code.

1102.3 Underground building storm drain pipe.

Underground building storm drain pipe shall conform to one of the standards listed in Table 702.2 of the 2012 International Plumbing Code.

1102.4 Building storm sewer pipe.

Building storm sewer pipe shall conform to one of the standards listed in Table 1102.4 of the 2012 International Plumbing Code.

TABLE 1102.4 BUILDING STORM SEWER PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D 2661; ASTM D 2751; ASTM F 628; CSA B181.1; CSA B182.1
Asbestos-cement pipe	ASTM C 428
Cast-iron pipe	ASTM A 74; ASTM A 888; CISPI 301
Concrete pipe	ASTM C 14; ASTM C 76; CSA A257.1M; CSA A257.2M
Copper or copper-alloy tubing (Type K, L, M or DWV)	ASTM B 75; ASTM B 88; ASTM B 251; ASTM B 306
Polyethylene (PE) plastic pipe	ASTM F 2306/F 2306M
Polyvinyl chloride (PVC) plastic pipe (Type DWV, SDR26, SDR35, SDR41, PS50 or PS100)	ASTM D 2665; ASTM D 3034; ASTM F 891; CSA B182.4; CSA B181.2; CSA B182.2
Vitrified clay pipe	ASTM C 4; ASTM C 700
Stainless steel drainage systems, Type 316L	ASME A112.3.1

1102.5 Subsoil drain pipe.

Subsoil drains shall be open-jointed, horizontally split or perforated pipe conforming to one of the standards listed in Table 1102.5 of the 2012 International Plumbing Code.

TABLE 1102.5 SUBSOIL DRAIN PIPE

MATERIAL	STANDARD
Asbestos-cement pipe	ASTM C 508
Cast-iron pipe	ASTM A 74; ASTM A 888; CISPI 301
Polyethylene (PE) plastic pipe	ASTM F 405; CSA B182.1; CSA B182.6; CSA B182.8
Polyvinyl chloride (PVC) Plastic pipe (type sewer pipe, PS25, PS50 or PS100)	ASTM D 2729; ASTM F 891; CSA B182.2; CSA B182.4

Stainless steel drainage systems, Type 316L	ASME A 112.3.1
Vitrified clay pipe	ASTM C 4; ASTM C 700

1102.6 Roof Drains.
Roof drains shall conform to ASME A112.6.4 or ASME A112.3.1.

1102.7 Fittings.
Pipe fittings shall be approved for installation with the piping material installed, and shall conform to the respective pipe standards or one of the standards listed in Table 1102.7. The fittings shall not have ledges, shoulders or reductions capable of retarding or obstructing flow in the piping. Threaded drainage pipe fittings shall be of the recessed drainage type.

TABLE 1102.7 PIPE FITTING

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D 2661; ASTM D 3311; CSA B181.1
Cast-iron	ASME B16.4; ASME B16.12; ASTM A 888; CISPI 301; ASTM A 74
Coextruded composite ABS and drain DR-PS in PS35, PS50, PS100, PS140, PS200	ASTM D 2751
Coextruded composite ABS DWV Schedule 40 IPS pipe (solid or cellular core)	ASTM D 2661; ASTM D 3311; ASTM F 628
Coextruded composite PVC DWV Schedule 40 IPS-DR, PS140, PS200 (solid or cellular core)	ASTM D 2665; ASTM D 3311; ASTM F 891
Coextruded composite PVC sewer and drain DR-PS in PS35, PS50, PS100, PS140, PS200	ASTM D 3034
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29
Gray iron and ductile iron	AWWA C110/A21.10
Malleable iron	ASME B16.3
Plastic, general	ASTM F 409
Polyethylene (PE) plastic pipe	ASTM F 2306/F 2306M
Polyvinyl chloride (PVC)	ASTM D 2665; ASTM D 3311;

plastic	ASTM F 1866
Steel	ASME B16.9; ASME B16.11; ASME B16.28
Stainless steel drainage systems, Type 316L	ASME A112.3.1

1103 TRAPS

1103.1 Main trap.
Leaders and storm drains connected to a combined sewer shall be trapped. Individual storm water traps shall be installed on the storm water drain branch serving each conductor, or a single trap shall be installed in the main storm drain just before its connection with the combined building sewer or the public sewer.

1103.2 Material.
Storm water traps shall be of the same material as the piping system to which they are attached.

1103.3 Size.
Traps for individual conductors shall be the same size as the horizontal drain to which they are connected.

1103.4 Cleanout.
An accessible cleanout shall be installed on the building side of the trap.
1104 CONDUCTORS AND CONNECTIONS

1104.1 Prohibited use.
Conductor pipes shall not be used as soil, waste or vent pipes, and soil, waste or vent pipes shall not be used as conductors.
1104.2 Combining storm with sanitary drainage.
The sanitary and storm drainage systems of a structure shall be entirely separate except where combined sewer systems are utilized. Where a combined sewer is utilized, the building storm drain shall be connected in the same horizontal plane through a single-wye fitting to the combined sewer not less than 10 feet (3048 mm) downstream from any soil stack.

1104.3 Floor drains.
Floor drains shall not be connected to a storm drain.
1105 ROOF DRAINS

1105.1 General.
Roof drains shall be installed in accordance with the manufacturer's instructions. The inside opening for the roof drain shall not be obstructed by the roofing membrane material.

1105.2 Roof drain flashings.
The connection between roofs and roof drains which pass through the roof and into the interior of the building shall be made water-tight by the use of approved flashing material.
1106 SIZE OF CONDUCTORS, LEADERS AND STORM DRAINS

1106.1 General.
The size of the vertical conductors and leaders, building storm drains, building storm sewers, and any horizontal branches of such drains or sewers shall be based on the 100-year hourly rainfall rate indicated in Figure 1106.1 (3" in one hour for Lombard) or on other rainfall rates determined from approved local weather data.

1106.2 Vertical conductors and leaders.

Vertical conductors and leaders shall be sized for the maximum projected roof area, in accordance with Table 1106.2(1) and Table 1106.2(2).

TABLE 1106.2(1) SIZE OF CIRCULAR VERTICAL CONDUCTORS AND LEADERS

DIAMETER OF LEADER (inches)[a]	HORIZONTALLY PROJECTED ROOF AREA (square feet)											
	Rainfall rate (inches per hour)											
	1	2	3	4	5	6	7	8	9	10	11	12
2	2,880	1,440	960	720	575	480	410	360	320	290	260	240
3	8,800	4,400	2,930	2,200	1,760	1,470	1,260	1,100	980	880	800	730
4	18,400	9,200	6,130	4,600	3,680	3,070	2,630	2,300	2,045	1,840	1,675	1,530
5	34,600	17,300	11,530	8,650	6,920	5,765	4,945	4,325	3,845	3,460	3,145	2,880
6	54,000	27,000	17,995	13,500	10,800	9,000	7,715	6,750	6,000	5,400	4,910	4,500
8	116,000	58,000	38,660	29,000	23,200	19,315	16,570	14,500	12,890	11,600	10,545	9,600

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m2.

a. Sizes indicated are the diameter of circular piping. This table is applicable to piping of other shapes, provided the cross-sectional shape fully encloses a circle of the diameter indicated in this table. For rectangular leaders, see Table 1106.2(2). Interpolation is permitted for pipe sizes that fall between those listed in this table.

TABLE 1106.2(2) SIZE OF RECTANGULAR VERTICAL CONDUCTORS AND LEADERS

DIMENSIONS OF COMMON LEADER SIZES width x length (inches)[a, b]	HORIZONTALLY PROJECTED ROOF AREA (square feet)											
	Rainfall rate (inches per hour)											
	1	2	3	4	5	6	7	8	9	10	11	12
$1\frac{3}{4} \times 2\frac{1}{2}$	3,410	1,700	1,130	850	680	560	480	420	370	340	310	280
2 × 3	5,540	2,770	1,840	1,380	1,100	920	790	690	610	550	500	460
$2\frac{3}{4} \times 4\frac{1}{4}$	12,830	6,410	4,270	3,200	2,560	2,130	1,830	1,600	1,420	1,280	1,160	1,060
3 × 4	13,210	6,600	4,400	3,300	2,640	2,200	1,880	1,650	1,460	1,320	1,200	1,100
$3\frac{1}{2} \times 4$	15,900	7,950	5,300	3,970	3,180	2,650	2,270	1,980	1,760	1,590	1,440	1,320
$3\frac{1}{2} \times 5$	21,310	10,650	7,100	5,320	4,260	3,550	3,040	2,660	2,360	2,130	1,930	1,770
$3\frac{3}{4} \times 4\frac{3}{4}$	21,960	10,98	7,320	5,490	4,390	3,660	3,130	2,740	2,440	2,190	1,99	1,83

		0									0	0
$3^3/_4 \times 5^1/_4$	25,520	12,760	8,500	6,380	5,100	4,250	3,640	3,190	2,830	2,550	2,320	2,120
$3^1/_2 \times 6$	27,790	13,890	9,260	6,940	5,550	4,630	3,970	3,470	3,080	2,770	2,520	2,310
4×6	32,980	16,490	10,990	8,240	6,590	5,490	4,710	4,120	3,660	3,290	2,990	2,740
$5^1/_2 \times 5^1/_2$	44,300	22,150	14,760	11,070	8,860	7,380	6,320	5,530	4,920	4,430	4,020	3,690
$7^1/_2 \times 7^1/_2$	100,500	50,250	33,500	25,120	20,100	16,750	14,350	12,560	11,160	10,050	9,130	8,370

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m2.
a. Sizes indicated are nominal width × length of the opening for rectangular piping.
b. For shapes not included in this table, Equation 11-1 shall be used to determine the equivalent circular diameter, De, of rectangular piping for use in interpolation using the data from Table 1106.2(1).

De = [width × length]1/2 (Equation 11-1)

where:
De = equivalent circular diameter and De, width and length are in inches.

1106.3 Building storm drains and sewers.
The size of the building storm drain, building storm sewer and their horizontal branches having a slope of one-half unit or less vertical in 12 units horizontal (4-percent slope) shall be based on the maximum projected roof area in accordance with Table 1106.3. The slope of horizontal branches shall be not less than one-eighth unit vertical in 12 units horizontal (1-percent slope) unless otherwise approved.

TABLE 1106.3 SIZE OF HORIZONTAL STORM DRAINGE PIPING

SIZE OF HORIZONTAL PIPING (inches)	HORIZONTALLY PROJECTED ROOF AREA (square feet)					
	Rainfall rate (inches per hour)					
	1	2	3	4	5	6
1/8 unit vertical in 12 units horizontal (1-percent slope)						
3	3,288	1,644	1,096	822	657	548
4	7,520	3,760	2,506	1,800	1,504	1,253
5	13,360	6,680	4,453	3,340	2,672	2,227
6	21,400	10,700	7,133	5,350	4,280	3,566
8	46,000	23,000	15,330	11,500	9,200	7,600
10	82,800	41,400	27,600	20,700	16,580	13,800
12	133,200	66,600	44,400	33,300	26,650	22,200
15	218,000	109,000	72,800	59,500	47,600	39,650
1/4 unit vertical in 12 units horizontal (2-percent slope)						
3	4,640	2,320	1,546	1,160	928	773
4	10,600	5,300	3,533	2,650	2,120	1,766
5	18,880	9,440	6,293	4,720	3,776	3,146
6	30,200	15,100	10,066	7,550	6,040	5,033
8	65,200	32,600	21,733	16,300	13,040	10,866
10	116,800	58,400	38,950	29,200	23,350	19,450
12	188,000	94,000	62,600	47,000	37,600	31,350
15	336,000	168,000	112,000	84,000	67,250	56,000
1/2 unit vertical in 12 units horizontal (4-percent slope)						
3	6,576	3,288	2,295	1,644	1,310	1,096
4	15,040	7,520	5,010	3,760	3,010	2,500
5	26,720	13,360	8,900	6,680	5,320	4,450
6	42,800	21,400	13,700	10,700	8,580	7,140
8	92,000	46,000	30,650	23,000	18,400	15,320
10	171,600	85,800	55,200	41,400	33,150	27,600
12	266,400	133,200	88,800	66,600	53,200	44,400
15	476,000	238,000	158,800	119,000	95,300	79,250

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m^2.

1106.4 Vertical walls.
In sizing roof drains and storm drainage piping, one-half of the area of any vertical wall that diverts rainwater to the roof shall be added to the projected roof area for inclusion in calculating the required size of vertical conductors, leaders and horizontal storm drainage piping.

1106.5 Parapet wall scupper location.
Parapet wall roof drainage scupper and overflow scupper location shall comply with the requirements of Section 1503.4 of the International Building Code.

1106.6 Size of roof gutters.
The size of semicircular gutters shall be based on the maximum projected roof area in accordance with Table 1106.6.

TABLE 1106.6 SIZE OF SEMICIRCULAR ROOF GUTTERS

DIAMETER OF GUTTERS (inches)	HORIZONTALLY PROJECTED ROOF AREA (square feet) Rainfall rate (inches per hour)					
	1	2	3	4	5	6
1/16 unit vertical in 12 units horizontal (0.5-percent slope)						
3	680	340	226	170	136	113
4	1,440	720	480	360	288	240
5	2,500	1,250	834	625	500	416
6	3,840	1,920	1,280	960	768	640
7	5,520	2,760	1,840	1,380	1,100	918
8	7,960	3,980	2,655	1,990	1,590	1,325
10	14,400	7,200	4,800	3,600	2,880	2,400
1/8 unit vertical 12 units horizontal (1-percent slope)						
3	960	480	320	240	192	160
4	2,040	1,020	681	510	408	340
5	3,520	1,760	1,172	880	704	587
6	5,440	2,720	1,815	1,360	1,085	905
7	7,800	3,900	2,600	1,950	1,560	1,300
8	11,200	5,600	3,740	2,800	2,240	1,870
10	20,400	10,200	6,800	5,100	4,080	3,400
1/4 unit vertical in 12 units horizontal (2-percent slope)						
3	1,360	680	454	340	272	226
4	2,880	1,440	960	720	576	480
5	5,000	2,500	1,668	1,250	1,000	834
6	7,680	3,840	2,560	1,920	1,536	1,280
7	11,040	5,520	3,860	2,760	2,205	1,840
8	15,920	7,960	5,310	3,980	3,180	2,655
10	28,800	14,400	9,600	7,200	5,750	4,800
1/2 unit vertical in 12 units horizontal (4-percent slope)						
3	1,920	960	640	480	384	320
4	4,080	2,040	1,360	1,020	816	680
5	7,080	3,540	2,360	1,770	1,415	1,180
6	11,080	5,540	3,695	2,770	2,220	1,850
7	15,600	7,800	5,200	3,900	3,120	2,600
8	22,400	11,200	7,460	5,600	4,480	3,730
10	40,000	20,000	13,330	10,000	8,000	6,660

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m^2.

1107 SIPHONIC ROOF DRAINAGE SYSTEMS

1107.1 General.
Siphonic roof drains and drainage systems shall be designed in accordance with ASME A112.6.9 and ASPE 45.
1108 SECONDARY (EMERGENCY) ROOF DRAINS

1108.1 Secondary (emergency overflow) drains or scuppers.
Where roof drains are required, secondary (emergency overflow) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason.

1108.2 Separate systems required.
Secondary roof drain systems shall have the end point of discharge separate from the primary system. Discharge shall be above grade, in a location that would normally be observed by the building occupants or maintenance personnel.

1108.3 Sizing of secondary drains.
Secondary (emergency) roof drain systems shall be sized in accordance with Section 1106 based on the rainfall rate for which the primary system is sized in Tables 1106.2(1), 1106.2(2), 1106.3 and 1106.6. Scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by Section 1101.7. Scuppers shall have an opening dimension of not less than 4 inches (102 mm). The flow through the primary system shall not be considered when sizing the secondary roof drain system.
1109 COMBINED SANITARY AND STORM SYSTEM

1109.1 Size of combined drains and sewers.
The size of a combination sanitary and storm drain or sewer shall be computed in accordance with the method in Section 1106.3. The fixture units shall be converted into an equivalent projected roof or paved area. Where the total fixture load on the combined drain is less than or equal to 256 fixture units, the equivalent drainage area in horizontal projection shall be taken as 4,000 square feet (372 m2). Where the total fixture load exceeds 256 fixture units, each additional fixture unit shall be considered the equivalent of 15.6 square feet (1.5 m2) of drainage area. These values are based on a rainfall rate of 1 inch (25 mm) per hour.
1110 VALUES FOR CONTINUOUS FLOW

1110.1 Equivalent roof area.
Where there is a continuous or semicontinuous discharge into the building storm drain or building storm sewer, such as from a pump, ejector, air conditioning plant or similar device, each gallon per minute (L/m) of such discharge shall be computed as being equivalent to 96 square feet (9 m2) of roof area, based on a rainfall rate of 1 inch (25.4 mm) per hour.
1111 CONTROLLED FLOW ROOF DRAIN SYSTEMS

1111.1 General.
The roof of a structure shall be designed for the storage of water where the storm drainage system is engineered for controlled flow. The controlled flow roof drain system shall be an engineered system in accordance with this section and the design, submittal, approval, inspection and testing requirements of Section 105.4. The controlled flow system shall be designed based on the required rainfall rate in accordance with Section 1106.1.

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1111.2 Control devices.

The control devices shall be installed so that the rate of discharge of water per minute shall not exceed the values for continuous flow as indicated in Section 1109.1.

1111.3 Installation.
Runoff control shall be by control devices. Control devices shall be protected by strainers.

1111.4 Minimum number of roof drains.
Not less than two roof drains shall be installed in roof areas 10,000 square feet (929 m2) or less and not less than four roof drains shall be installed in roofs over 10,000 square feet (929 m2) in area.

1112 SUBSOIL DRAINS

1113 BUILDING SUBDRAINS

1113.1 Building subdrains.
Building subdrains located below the public sewer level shall discharge into a sump or receiving tank, the contents of which shall be automatically lifted and discharged into the drainage system as required for building sumps. The sump and pumping equipment shall comply with Section 1114.1.
1114 SUMPS AND PUMPING SYSTEMS

1114.1 Pumping system.
The sump pump, pit and discharge piping shall conform to Sections 1114.1.1 through 1114.1.4.

1114.1.1 Pump capacity and head.
The sump pump shall be of a capacity and head appropriate to anticipated use requirements.
1114.1.2 Sump pit.
The sump pit shall not be less than 18 inches (457 mm) in diameter and not less than 24 inches (610 mm) in depth, unless otherwise approved. The pit shall be accessible and located such that all drainage flows into the pit by gravity. The sump pit shall be constructed of tile, steel, plastic, cast-iron, concrete or other approved material, with a removable cover adequate to support anticipated loads in the area of use. The pit floor shall be solid and provide permanent support for the pump.
1114.1.3 Electrical.
Electrical service outlets, when required, shall meet the requirements of NFPA 70.
1114.1.4 Piping.
Discharge piping shall meet the requirements of Section 1102.2, 1102.3 or 1102.4 and shall include a gate valve and a full flow check valve. Pipe and fittings shall be the same size as, or larger than, pump discharge tapping.

Exception: In one- and two-family dwellings, only a check valve shall be required, located on the discharge piping from the pump or ejector.