

IPSDC



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## 2024 GROUP A PROPOSED CHANGES TO THE I-CODES

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# 2024 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL PLUMBING CODE

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Plumbers Local One Trade Education Fund,  
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Assoc.  
VP Regulatory Affairs  
PHCC-National Association  
South Bend, IN

**Staff Secretariat:**  
**Fred Grable, PE**  
Senior Staff Engineer - Plumbing  
International Code Council  
Central Regional Office  
Country Club Hills, IL

# TENTATIVE ORDER OF DISCUSSION 2021 PROPOSED CHANGES TO THE INTERNATIONAL PLUMBING CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some P code change proposals may not be included on this list, as they are being heard by another committee.

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IPSDC: CHAPTER 2, SECTION 202, SECTION 202 (New), CHAPTER 13, SECTION 1301, 1301.1, 1301.2, 1301.3 (New), 1301.4 (New), 1301.5 (New), SECTION 1302 (New), 1302.1 (New), 1302.2 (New), 1302.3 (New), 1302.3.1 (New), 1302.3.2 (New), 1302.3.3 (New), 1302.3.4 (New), 1302.3.4.1 (New), 1302.4 (New), 1302.4.1 (New), 1302.4.2 (New), 1302.4.3 (New), 1302.4.4 (New), 1302.4.5 (New), 1302.4.6 (New), 1302.4.7 (New), 1302.4.8 (New), 1302.4.9 (New), 1302.4.10 (New), 1302.4.11 (New), 1302.4.11.1 (New), 1302.4.11.2 (New), 1302.4.11.3 (New), 1302.4.11.4 (New), 1302.4.11.5 (New), 1302.4.11.6 (New), 1302.4.11.7 (New), 1302.5 (New), 1302.5.1 (New), 1302.5.2 (New), 1302.5.3 (New), 1302.6 (New)

**Proponents:** Mathew Lippincott, University of Michigan, self (mlippin@umich.edu); Martin Hammer, Martin Hammer, Architect (mfhammer@pacbell.net); Pat Lando, Recode (pat@reodenow.org); Ashton Merck, NC State University / STEPS Center, self; Nancy Love, University of Michigan, self; John Lansing, PAE Consulting Engineers (john.lansing@pae-engineers.com); Abraham Noe-Hays, Rich Earth Institute (abe@richearthinstitute.org); Miriam Hacker, Myself; Mark Buehrer, 2020 ENGINEERING, Inc., 2020 ENGINEERING, Inc. (mark@2020engineering.com); Lucas Crane, Arizona State University, self (lccrane1@asu.edu); Hayley Joyell Smith, PHLUSH (Public Hygiene Lets Us Stay Human), PHLUSH, Board Director (hayley@phlush.org); Kim Nace, Brightwater Tools (kim@brightwatertools.com); A P Robertson, self, self (sandyrob51@gmail.com); Treavor Boyer, Arizona State University / STEPS, self (thboyer@asu.edu)

## 2024 International Private Sewage Disposal Code

### CHAPTER 2 DEFINITIONS

## SECTION 202 GENERAL DEFINITIONS

#### Add new definition as follows:

**COMMODOE.** A fixture without connection to a sanitary drainage system used for collecting, containing, or transporting excreta to a compost processor. (also dry toilet, urine diverting dry toilet, vacuum flush toilet, foam flush toilet).

**COMPOST ADDITIVES.** Any material such as sawdust, wood shavings, and other compostable material added to maintain operational conditions within the composting toilet system.

**COMPOSTING TOILET SYSTEM.** A system designed to safely collect and process excreta and compost additives into humus through aerobic decomposition.

**COMPOST PROCESSOR.** The site of aerobic decomposition transforming excreta and compost additives into humus.

**DIVERTED URINE.** Urine that is collected separately from fecal matter.

**EXCRETA.** Includes but is not limited to urine, feces, menses, and other human body emissions, as well as toilet paper and biodegradable cleaning products.

**HUMUS.** The biologically decomposed, soil-like output of the compost processor.

**LEACHATE.** Liquid drained from a compost processor.

**SECONDARY COMPOSTING.** Additional retention and continued decomposition of humus removed from compost processors in order to meet the required retention time.

**URINE DIVERSION.** Collection of diverted urine that occurs at the fixture.

**URINE DIVERTING COMMODOE.** A commode that separates urine from other excreta and directs urine to a urine diversion system that is in accordance with the International Plumbing Code.

#### Revise as follows:

## SECTION 1301 GENERAL

**Revise as follows:**

**1301.1 Scope.**

The provisions of this chapter shall govern ~~nonliquid saturated treatment systems~~ composting toilet systems.

**1301.2 ~~Nonliquid saturated treatment systems~~ Maintenance responsibility.**

~~The regulations for materials, design, construction and performance shall comply with NSF 41.~~ The required maintenance and inspection of *composting toilet systems* shall be the responsibility of the property owner, unless otherwise required by the code official.

**Add new text as follows:**

**1301.3 Operation.** *Composting toilet systems* shall be operated and maintained in a safe and sanitary condition in accordance with the Section 1301.4.

**1301.4 Operation and maintenance manual.** An operation and maintenance manual shall be supplied in hardcopy with all systems. The manual shall be transferred to the new owner or tenant upon transfer of property or tenancy. The manual shall include the following items:

1. Schedule for addition of necessary *compost additives*.
2. Source or provider of necessary *compost additives*. Source may be on-site.
3. Schedule for all regular maintenance tasks.
4. Instructions for all regular maintenance tasks.
5. Expected input of and capacity for *excreta* and *compost additives* to compost toilet system specifying loading of *commode(s)* and *compost processor(s)*.
6. Treatment period and expected schedule for removing *humus* from *composting processors* and *secondary composting*, where used.
7. Plan for container transfer and cleaning where transfer is used.
8. Plan for on-site disposal of *humus* or professional removal.
9. Plan for managing *leachate*.
10. For *composting toilet systems* not tested to NSF 41, a plan for microbial testing in accordance with Section 1302.5.2.

**1301.5 Approved systems.** Composting toilets and *composting toilet systems* shall comply with NSF 41 or shall be in accordance with Section 1302.

## SECTION 1302 COMPOSTING TOILET SYSTEM DESIGN

**1302.1 Approval.** *Composting toilet systems* complying with this section shall be permitted for residential, commercial, and institutional applications.

**1302.2 System records.** The property owner is responsible for retaining test result records in accordance with the Section 1302.5.2 and making such records available to the *code official* upon request. Upon transfer of property or tenancy, all test records shall be transferred

to the owner or tenant, and *humus* shall be re-tested after its first treatment period and a record retained by the property owner.

**1302.3 System materials and components.** All components expected to contact *excreta* or *leachate* shall be constructed of corrosion-resistant material such as stainless steel or durable polymers. Concrete in contact with *excreta* or *leachate* shall meet requirements of Section 1302.3.3.

**1302.3.1 Pipes and fixtures.** Pipe, pipe fittings, traps, fixtures, material, and devices used in *composting toilet systems* that are expected to contact *leachate* or *diverted urine* shall be listed by an approved agency or a third-party certification agency in accordance with Section 505 or the International Plumbing Code, unless otherwise approved by the *code official*. Products and materials shall be identified.

**1302.3.2 Screening.** Where screening is required to prevent the unintentional entry of insects and vermin, screening shall have openings with a maximum size of 3/32 inch (2.5mm). Screening shall be made of materials compatible with the system components in contact with screen materials. Screen materials shall not generate galvanic corrosion of system components.

**1302.3.3 Concrete construction.** Concrete construction shall be reinforced, watertight, and able to withstand loading in compliance with Section 1302.3.3. Where drainage is required, the *compost processor* floor shall be sloped not less than 1/4-inch per foot (20mm per meter), or 2 percent. The flange of each sub-drain shall be set level.

**1302.3.4 Commodes.** *Commodes* shall be designed to support users of a weight not less than 300 pounds (136 kg). *Commodes* shall transport *excreta* into the *compost processor* or contain *excreta* for transfer as designed and in accordance with the operation and maintenance manual.

**1302.3.4.1 Urine diversion.** *Urine diversion* piping shall be connected to a *urine diversion* system in accordance with the International Plumbing Code.

**1302.4 Compost processors.** *Compost processors* shall maintain unsaturated aerobic composting conditions within the compost mass through the drainage, absorption or desiccation of *leachate*; and aeration of the *compost processor*.

**1302.4.1 Openings.** All openings shall be covered and secured to prevent tampering. Openings shall be screened or covered to prevent insect and vermin infiltration and be protected against unauthorized human entry.

**1302.4.2 Transfer.** Where unfinished *excreta* or *diverted urine* is transferred between *compost processors* or from *commode* to *compost processor*, transfer and cleaning of containers and provisions for limiting user exposure shall be in accordance with the operation and maintenance manual.

**1302.4.3 Watertightness.** *Compost processors* shall be constructed of watertight material in accordance with Section 1302.3.

**1302.4.4 Insects and vermin.** *Compost processors* shall be protected to prevent the unintentional entry of insects and vermin. No unsecured opening other than vents, drainage, or *commode* may exceed 1/2 inch (12.7 mm) in the least dimension.

**1302.4.5 Sizing.** *Compost processors* shall be sized to accommodate the maximum daily adult usage as specified by the manufacturer's or designer's published ratings. *Compost processors* shall be sized to hold at least 10 gallons (38L) of material per person per year while allowing for the removal of the *humus*.

**1302.4.6 Treatment period.** The *compost processor* or processors shall be sized to compost *excreta* for a treatment period with a minimum of one year of biologically active conditions. Biologically active conditions shall be maintained at or above a daily average of 42°F (6°C).

**Exception:** Systems with shorter treatment periods shall be permitted where either:



1. Humus from the compost processor has been tested in accordance with Section 1302.5.2 and transferred to secondary composting in accordance with Section 1302.4.7.
2. Humus is removed off site for processing or disposal at an approved facility.

**1302.4.7 Secondary composting.** Humus transferred to secondary composting shall first be tested in accordance with Section 1302.5.2. Secondary composting shall be labeled and protected from human contact in a well maintained compost bin or other facility designated for the exclusive purpose of containing humus removed from the compost processor. Contact with precipitation and surface waters shall be prohibited.

**1302.4.8 Venting.** Negative pressure between the commode and compost processor shall be provided where the compost processor is connected directly to the commode without a trap.

**1302.4.9 Vent terminals.** Vent stacks shall terminate to the exterior of the building in compliance with the requirements of the International Plumbing Code.

**1302.4.10 Leachate.** Leachate shall be collected for removal or recirculation within the compost processor, evaporated or drained to an approved sanitary drainage system or other location approved by the code official.

**1302.4.11 Leachate storage tanks.** Leachate storage tanks shall be constructed of corrosion resistant materials.

**1302.4.11.1 Venting.** Leachate storage tanks shall be vented as required for pressure equalization. When required, vents shall be installed on leachate storage tanks and shall extend from the top of the tank. Storage tank vents shall be permitted to connect to the plumbing venting system at least 6 inches (150mm) above the flood level rim of the highest fixture. Vents extending to the outdoors shall terminate no less than 12 inches (300mm) above grade. The vent terminal shall be directed downward and covered screening to prevent the unintentional entry of insects and vermin.

**1302.4.11.2 Vent size.** Pressure equalization vents that prevent nitrogen loss by the use of restrictions, or of piping or tubing that is less than the minimum pipe diameter required by Section 1302.3.1, shall be approved by the code official.

**1302.4.11.3 Overflow.** Where storage tank overflows are installed, they shall be connected to the sanitary drainage system.

**1302.4.11.4 Backwater prevention.** Storage tank overflows shall be provided with a backwater valve or check valve at any point of connection to a sanitary drainage system or private sewage disposal system subject to backflow. The backwater valve shall be accessible for inspections and maintenance.

**1302.4.11.5 Above grade.** Where subject to freezing conditions, storage tanks shall be provided with an adequate means of freeze protection. Above grade leachate storage tank shall be provided with a high-water sensing device and alarm system. The alarm shall report when 80 percent volume is reached.

**1302.4.11.6 Below grade.** Leachate storage tanks installed below grade shall be structurally designed to withstand all anticipated earth or other loads. Tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft<sup>2</sup>) (150 kg/m<sup>2</sup>) when the tank is designed for underground installation. Below grade leachate tanks installed underground shall be provided with manholes. The manhole opening shall be at least 20 inches (500 mm) in diameter and located at least 4 inches (100 mm) above the surrounding grade. The surrounding grade shall be sloped away from the manhole. Underground tanks shall be ballasted, anchored, or otherwise secured, to prevent the tank from floating out of the ground when empty. The combined hold-down capacity of the tank and hold down system shall meet or exceed the buoyancy force of the tank. Below grade leachate storage tank shall be provided with a high-water sensing device and alarm system.

**1302.4.11.7 Marking.** Where openings are provided to allow a person to enter the tank, the opening shall be marked with the following words: "DANGER—CONFINED SPACE." The letters shall be not less than 0.5 inch (12.7 mm) in height and shall be of a color in contrast

with the background on which they are applied.

**1302.5 Testing.** Prior to permit issuance, *composting toilet systems* shall be tested for watertightness in accordance with Section 1302.5.1. Humus from the first treatment period shall be tested after the first treatment period in accordance with Section 1302.5.2.

**1302.5.1 Compost processors.** *Compost processors* shall be tested for watertightness by filling the system to the maximum designed liquid storage capacity of the unit for a duration of 24 hours.

**1302.5.2 Humus.** The owner or owner's agent of the *composting toilet system* shall verify compliance with the operation and maintenance manual after the first treatment period and before removal of *humus* from the *compost processor*. A sample of the *humus* from the first treatment period shall be submitted to a certified laboratory. Where multiple *compost processors* are used, the *humus* sample shall be removed from the last *compost processor*. The sample shall be tested in accordance with NSF 41. *Humus* shall not have a moisture content exceeding 75 percent by weight, and the most probable number (MPN) fecal coliform assay shall not exceed 200 MPN per gram (dry weight basis).

**1302.5.3 Testing following repairs and alterations.** If the *code official* determines that new tests are required following repairs or alterations, tests shall be conducted at the owner's expense and in accordance with Section 1302.5.

**1302.6 Humus removal.** *Humus* shall be removed in accordance with the operation and maintenance manual. *Humus* from the *compost processor* shall be permitted to be used around ornamental shrubs, flowers, trees, or fruit trees and shall be mixed with soil or mulch and covered with at least 3 inches (76mm) of cover material. Depositing *humus* from any *composting toilet system* around any edible vegetable or vegetation shall be prohibited.

**Reason:** This proposal offers two paths to composting toilet system approval: either following NSF 41 (as currently provided for in Chapter 13), or with a system inspected and tested to requirements or standards that are as strict or stricter than NSF 41 (through this proposal's new provisions). Integration of the provisions of this proposal into the IPSDC will promote time-tested, safe practices by placing clear requirements for each system component directly into the code. Under the path added by this proposal, each system installation is verified for watertightness, mandated to have a 1-year treatment period to ensure pathogen destruction, tested for proper operation, and required to document and preserve operation and maintenance information. System features that NSF 41 leaves to individual manufacturers or jurisdictions, including venting, screening for insects and vermin, leachate management, and disposal of the outputs of compost processors away from human contact, are subject to clear and enforceable requirements under this proposal. This proposal is intended to promote the growth of a domestic component supply industry for composting toilet systems that will enable the design of systems appropriate to the scale of the installation. Because NSF 41 treats composting toilet systems as manufactured products rather than systems assembled from a variety of components, the size of composting chambers is limited. For instance, the Bullitt Center in Seattle required multiple Phoenix composting chambers, and load balancing the various chambers created maintenance headaches that were pivotal to removal of the composting toilet system.<sup>1</sup> Under the requirements of this proposal, larger composting chambers could be assembled on-site and tested for watertightness and treatment efficacy, potentially simplifying system design and long-term maintenance. Such site-built composting chambers have become a common feature of large-scale projects in the Netherlands and elsewhere.<sup>2</sup>

Urine diversion can improve the function and reduce the labor and compost additives needed to control odor in a composting toilet system. The use of urine diversion with composting toilets was a core recommendation of the Bullitt Center team. Urine diversion is connected by this proposal's Section 1302.3.4.1 to the IPC and through a parallel Urine Diversion Systems proposal for the IPC. The language in this proposal is based on the Recode Model Code, which incorporates the latest best practices from around the globe. The Recode Model Code was created in 2015 through a consensus process with a national team of U.S. experts, and was incorporated into IAPMO'S 2017 Water Efficiency and Sanitation Standard (WE Stand), which was revised in 2020 and 2023. The latest Recode Model Code incorporates refinements from the WE Stand process and lessons learned by designers and installers in the interim.

Additionally, a change in the title of Chapter 13 is proposed from "Non-Liquid Saturated Treatment Systems" because that term is not standard in either the industry or its literature, and appears only in NSF 41. The proposed title "Composting Toilet Systems" emphasizes the entire system, rather than a single product, and is a common term used in industry literature and by NSF 41 tested manufacturers such as 'Sun Mar' and 'Advanced Composting Systems'.

(1) [The Bullitt Center Composting Toilet System A White Paper on Lessons Learned](#), Bullitt Foundation, Seattle, WA, 2021.

(2) Lansing, J. *Designing for Source Separation – the Key to a Regenerative Building*. Rich Earth Summit, Brattleboro, VT, 2023.

**Bibliography: 1302.4.6 Treatment period.**

One year is approximately twice as long as the survival time of *Ascaris* (Roundworm) eggs under active composting, per Table 6-2 of *Biosolids Applied to Land*. *Ascaris* are used as an indicator species for long-lived and hard-shelled pathogens.

National Research Council. 2002. *Biosolids Applied to Land*. Washington, DC: The National Academies Press.

<https://doi.org/10.17226/10426>

**1302.5.2 Humus.**

Bacteriological testing requirements are per NSF 41.

**Cost Impact:** The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

- **CT-equipment-cost.pdf**

<https://www.cdpassess.com/proposal/10314/30802/documentation/147968/attachments/download/4627/>

**Justification for no cost impact:**

Composting toilet systems tested to NSF 41 and those not tested to NSF 41 are comparably priced for similar feature sets and capacities. Under this proposal, systems not tested to NSF 41 will also require a fecal coliform test, which will add \$30-60 to those systems; however, the equipment costs will remain comparable.

Composting toilet systems designed for full-time residential use by one to six users and with the most basic dry commode are available in sufficient variety to compare equipment prices of NSF 41 tested systems and those not tested to NSF 41. For NSF 41 tested systems meeting the above criteria, market prices range from \$639 to \$7700. Systems meeting the same criteria that are not tested to NSF 41 range in price from \$1280 to \$4745. Please see the attached table for equipment prices as of January 2024.

For engineered systems built on-site and meeting similar criteria, Nutrient Networks estimates system costs of \$400 to \$6000 before installation.

# PSD2-24

IPSDC: 1101.2, NSF Chapter 14 (New)

**Proponents:** Jeremy Brown, NSF International, NSF International (brown@nsf.org)

## 2024 International Private Sewage Disposal Code

**Revise as follows:**

### 1101.2 Residential wastewater treatment systems.

The regulations for materials, design, construction and performance shall comply with NSF 40 or IAPMO/ISO 30500. Where nitrogen reduction is required, the materials, design, construction and performance shall comply with NSF 245 or IAPMO/ISO 30500.

**Add new standard(s) as follows:**

## NSF

NSF International  
789 N. Dixboro Road  
Ann Arbor, MI 48105

245-2023

Residential Wastewater Treatment Systems - Nitrogen Reduction

**Staff Analysis:** A review of the standard proposed for inclusion in the code, NSF 245-2023 *Residential Wastewater Treatment Systems - Nitrogen Reduction*, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

**Reason:** Nitrogen reduction is required by some AHJ's when treating effluent water quality requirements. Excess nitrogen can cause surface water algae blooms. This code change does not require nitrogen reduction in all installations, but does provide requirements when nitrogen reduction is required. NSF/ANSI 245 is the American National Standard for Nitrogen reduction. There are at least 12 states that require NSF/ANSI 245 in their regulations. There are 179 systems and 17 manufacturers listed by NSF to NSF/ANSI 245. A copy of NSF/ANSI 245 may be obtained for free by emailing brown@nsf.org.

**Cost Impact:** The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

**Justification for no cost impact:**

First, this proposal does not require nitrogen reduction. Where authorities do require nitrogen reduction, it references the ISO and American National Standards. As the majority of products on the market already have certification, this code change is not expected to add additional cost.

PSD2-24

