CSA B805 / ICC 805 Technical Committee on Rainwater Harvesting Systems
Agenda for Technical Committee Meeting No. 11, February 8, 2022
CSA File: B227
V1

CSA B805/ICC 805 Technical Committee on Rainwater Harvesting Systems

Meeting No. 11 - Agenda

February 8, 2022 – 1:00pm to 4:00pm EST

Virtual via WEBEX

A.32.1 Administration

A.32.2 Opening Remarks

A.32.2.1 Welcome

A.32.2.2 Code of Conduct / Conflict of Interest / Anti-trust guidelines

A.32.2.3 Attendance / Roll Call

A.32.2.4 Quorum

A.32.2.5 Vote Tabulation

A.32.3 Adoption of Draft Agenda

A.32.4 Technical Committee Membership

A.32.4.1 Review of Committee Membership

A.32.4.2 Matrix

Technical Agenda

A.32.5 Review of Outstanding Action Items

ref no.	action	due date / status
None		

A.32.6 Standards in Progress

A.32.6.1* CSA B805 /ICC 805 *Rainwater Harvesting Systems

Current edition of standard is coming up due for review on April 12th, 2023. One proposal was submitted for consideration and balloted to the committee.

Amendment proposal and ballot report to be discussed and finalized at the meeting [Refer to attachments #1 and #2].

Project timeline and schedule to also be discussed at the meeting.

A.32.7 Project Ballots

A.32.7.1 Project RH-21-02 – Proposed amendments to 2018 edition.

Proposal Ballot 8199 closed: November 29th, 2021 [Project ballot comments disposition report attached- attachment# 2]

A.32.8 Open Projects

None to report

A.32.9 New Business

Conclusion

A.32.10 Next Meeting Location and Date

A.32.11 Adjournment

Attachments

Attachment #1 – Proposal RH-21-01- Proposed amendments to 2018 edition.

Attachment #2 – Proposal ballot 8199 – Comments Disposition Report.

Attachment #1

Proposal RH-21-01- Proposed amendments to 2018 edition.

Amendment Proposal

RH-21-01
Proposed Amendments to 2018 Edition

Standard **CSA B805-18/ICC 805-2018**
Standard Name **Rainwater Harvesting Systems**

draft no.: **1**

submission date: **October 14th, 2021**

submitted by: **Ken Nentwig**

note: This draft is under development and subject to change. It shall not be used for reference purposes.

Canadian Standards Association
178 Rexdale Boulevard,
Toronto ON M9W 1R3
Canada

International Code Council
4051 Flossmoor Road
Country Club Hills, IL 60478
United States of America

Amendment Proposal

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Proposed Additions and Alterations

3.1 Definitions

Debris excluder - a device or method for removal of debris carried from the collection surface by filtering the rainwater through a screen. The debris excluder is normally the first filter or screen in the rainwater system.

First-flush diverter — a device or method for removal of sediment and suspended contaminants ~~debris~~ from the collection surface by diverting initial rainfall from entry into the storage tank. The first-flush diverter is either preceded by a debris excluder, or is integral to the debris excluder.

Inlet pre-filter — a device installed on the rainwater conveyance pipe prior to the first-flush diverter device or method (if used), and prior to the primary storage vessel on a rainwater system (see *Debris filter)*.
Note: *An inlet pre-filter is intended to mitigate the introduction of, e.g., vermin, leaves, sticks, needles, tree fruit, bark, moss, or any other unwanted debris or roof contaminant that could enter the system.*

Rationale

First-flush diverters are not intended to remove debris from the rainwater, and a debris excluder/inlet pre-filter should precede the first-flush diverter.

THIS COULD BE ELIMINATED BY USING DEBRIS EXCLUDER, although both exist

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Debris excluder is seen in 7.2.7, 7.2.9.2
Inlet pre-filter is seen in 7.2.9.2, D.5.2.f

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Proposed Additions and Alterations

3.1 Definitions

Rainfall abstraction — a measure of the amount of rainfall that is lost from absorption into and wetting of roof surfaces, or the amount of water that is lost due to the operation of pre-storage filtration and first-flush diverters
Note: ~~*First-flush diverters usually collect the first 2 mm (0.08 in) of rainfall and prevent it from reaching the tank.*~~ *Rainfall abstraction is usually expressed in mm or inches.*

Rationale

Continuity of wording with previous definitions, and with Annex C 2.2.2.2 and following sections.

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Proposed Additions and Alterations

3.1 Definitions

Rainwater outlet — the point of entrance at the storage tank into the distribution system, to a pump inlet, to the overflow piping, or to other system components (e.g. slow-release orifice for stormwater management).

Rationale

Outlets from the storage tank can be numerous.

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Proposed Additions and Alterations

3.1 Definitions

Bypass system - piping and devices that direct a secondary water supply to fulfill the end use requirements of a rainwater harvesting system without refilling the storage tank or cistern.

Make-up system - piping and devices that direct a secondary water supply to add water to the storage tank or cistern.

Secondary water supply — an alternative source of water that serves as either make-up system water or as bypass system water for a rainwater harvesting system.

Rationale

The definition could be understood as ‘water for cleaning the rainwater system’ or any number of other interpretations, meanwhile missing the point. Both makeup and bypass water systems are mentioned in 7.3.7.1 and various subsequent sections.

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Proposed Additions and Alterations

3.1 Definitions

Ultraviolet transmittance (UVT) — the measure of the fraction of incident germicidal ultraviolet light remaining after passing through 1 cm (0.39 in) of sample water expressed as a percentage of the transmission through pure water.
Note: *This value is a measurement of the clarity or turbidity of water. For example, water from a metal roof after a 350 micron filter might have a UVT of 90%. As water quality changes, the UVT% of said water also changes.*

Rationale

'Measurement of water' (volume, flow, temperature, depth, etc) is different than measurement of a quality or characteristic of the water. The last sentence in the note emphasizes this point.

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Proposed Additions and Alterations

5.1.3 Continuity of supply

Where rainwater harvesting systems serve as a primary supply for a distribution system, a secondary water supply shall be provided when system demand or continuity of supply may be compromised, or when required by the authority having jurisdiction. The secondary supply shall comply with Clause 7.3.7 and the plumbing code. ~~When a secondary water supply is approved by the authority having jurisdiction, t~~The secondary system shall be sized to meet the maximum demand of the end use.

Rationale

A secondary water supply may be (deemed) necessary even without being required by the AHJ. Sizing of the secondary water system is not solely dependent on approval by the AHJ.

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Proposed Additions and Alterations

5.1.9 Local site conditions

The system design, installation, and materials shall be suitable for local site conditions, including, but not limited to

a) freezing;
b) excessive heat;
c) high wind;
d) seismic activity;
e) extreme rainfall;
f) contaminants;
g) elevation of water table;
h) flooding; ~~and~~
i) sunlight exposure~~.~~, and
j) topography.

Rationale

There are many important aspects of a site, including soil conditions, topography, zoning, public access…. Topography seemed to be the most important one missing.

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5.1.12.2 Construction documents

The following completed or pertinent examples of documents with an application for permit shall be provided as required to the authority having jurisdiction ~~with an application for permit~~:

a) system description and design narrative;
b) list of intended end uses;
c) site plan;
d) system specification and bill of materials;
e) piping diagram;
f) wiring schematics;
g) water safety plan (refer to Annex E); and
h) operations and maintenance manual.

Rationale

Some documents may not be complete at the time of application for permit, since design changes during the construction period or in the contractual arrangements and component availability may take place once the permit is issued. Final inspection and approval, where required, will necessitate more precise documentation. For permit, the documentation will have to be partially complete at least, and the AHJ may have a different set of requirements.

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Proposed Additions and Alterations

6.5 Buried collection and distribution piping

Except for irrigation piping located outside of a building and downstream of a backflow preventer, buried collection and distribution piping shall

a) maintain the separation distances from potable water piping specified by the authority having jurisdiction;

b) be protected from damage and potential sources of contamination in accordance with the plumbing code and

c) be i~~l~~dentified as non-potable in accordance with the plumbing code, where applicable.

Rationale

Consistency in wording

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Proposed Additions and Alterations

6.7.5.1 Alerts

Alerts shall be provided for critical control points identified by the WSP to indicate when the rainwater harvesting system is operating outside design parameters but not causing a hazard to life, health, ~~or~~ safety, or damage to the system or to related or adjacent structures.

6.7.5.2 Alarms

Alarms shall be provided for critical control points identified by the WSP to indicate when the rainwater harvesting system is operating outside the design parameters and potentially causing a hazard to life, health, ~~and~~ safety, or damage to the system or to related or adjacent structures.

Rationale

In common inspection parameters, a ‘full stop’ is required when there is potential danger to life. This added dimension to the wording is important.

Damage to structures such as buildings, services, roadways or even natural systems (e.g. habitats, flooding, erosion, etc) should be included.

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6.7.5.3 Alarm and alert output

Onsite alarms and alerts shall have audible or visible outputs, and ~~. Visual alarms~~ shall continue to operate for the duration of the alarm or alert condition. A remote alarm or alert system using electronic communication may be used to advise the responsible person that the system has failed or that failure is imminent, in addition to the onsite alarm or alert.

Rationale

This wording should perhaps be confirmed first with an alarm expert, and whether there are requirements through the AHJ for different operations.

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Proposed Additions and Alterations

Table 7.1
Collection surfaces per water end use tier for the prescriptive approach

Clarification of…

- the difference(s) between polyethylene membrane and TPO (thermoplastic polyolefin)
- the difference(s) between PVC and TPO
- algal treatments of roof shingles
- fire retardant wood (shingles)
- 'rubber roofing' according to cursory research includes EPDM, TPO, PVC, but what are the differences between these and **butyl** for example?
  (see Rubber/butyl/EPDM in the table)
- composite (shingles) are not listed, but are polymer
- polymer and acrylic are completely different applications: units vs applied liquid - should they be separated into their own categories?

Landscape~~d~~ runoff or, Landscaped area runoff

Rationale

There are many variations between or within the individual categories of surface material, and the vast majority will likely be unsuitable for potable applications without mitigating treatment of the rainwater. It is understood that this list cannot be exhaustive, but there are some question marks. Polymer, for example, is created from recycled

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plastic, and therefore not suitable for potable uses - is there a way to clarify these categories somewhat for the practitioner?

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Proposed Additions and Alterations

7.1.2 Roof runoff versus stormwater runoff

Rainwater that is ~~intercepted by roof material and~~
a) intercepted by roof material and not subject to pedestrian access, except for maintenance purposes, shall be considered roof runoff; and
b) that is subject to pedestrian access, or is from a vegetated roof, or intercepted by ground level surfaces (e.g., ~~vegetative roofs,~~ pedestrian surfaces, porous pavement, landscape runoff, paved parking, and street, freeway and shoulder areas on roadways), shall be considered stormwater runoff.

Rationale

Vegetated roofs are not considered ground level.

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Rationale

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Proposed Additions and Alterations

7.1.5 Equipment and appliances mounted on collection surfaces

Except where potential discharge of equipment and appliances is limited to potable water or clear water waste and the collection surface supplies rainwater harvesting systems utilized exclusively for Tier 1 or 2 applications (excluding evaporative cooling), no roof runoff shall be collected. Equipment and appliances containing toxic fluids or other potentially harmful substances shall not be installed on collection surfaces.

Rationale

The standard is not intended to outline criteria for equipment or appliances.

It is unclear whether 'excluding evaporative cooling' means
- discharge (if any) from evaporative cooling, or
- Tier 1 or 2 but not including collection from roofs with evaporative cooling equipment, or if it means
- collection of rainwater used for evaporative cooling equipment/operations….

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Proposed Additions and Alterations

7.3.4.3.1 General

The design of buried or partially buried tanks shall consider the
a) external loads on the tank including the weight of the backfill together with hydrostatic, overburden, and live loads;
b) soil type at the site and the tank loading when the tank is either full or empty; and
c) manufacturer's installation requirements.

Rationale

Corrected wording

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7.3.5.2 Protection of water from direct sunlight

Water conveyed to storage or contained within storage tanks shall be protected from direct sunlight through the use of opaque, UV-resistant materials, either applied to components as paint or through structures providing cover or shade.

Rationale

This applies to above-ground exterior piping and storage tanks.

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7.3.7.6 ~~Directly connected~~ Bypass water supply systems

Bypass water supply systems ~~Directly connected water supplies~~ shall be directly connected to the distribution system to maintain the water supply and sized to meet the maximum anticipated demand of the end use. Where an automatic directly connected water supply is utilized, an alert shall be provided in accordance with Clause 6.7.5 indicating when the directly connected water supply system is in operation.

Rationale

7.3.7 describes secondary water supply (see 3.1 Definitions as well);

7.3.7.5 ‘Makeup water supply systems’ add water to the tank, ‘Bypass water systems’ ignore the tank and feed directly into the distribution system, as described in 7.3.1.

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9.7 Inspection of vermin and insect protection

Inlets, outlets and vents ~~to~~ of the system shall be inspected to verify each is protected to prevent the entrance of insects and vermin into the storage tank and piping systems in accordance with Clause 5.1.8.

Rationale

Overflow outlet components installed in the tank often include a secondary protection from vermin and insects entering the tank.

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Figure A.1

Particle size spectrum

- source?
- reverse the direction: large-to-small, left-to-right

Rationale

Following some of the protocols of design and flows within systems, left-to-right. A source of the information, unless compiled by CSA Working Group, might be helpful.

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Proposed Additions and Alterations

C.2.1.5 Empirical weather data sourcing

The empirical weather data shall be sourced from a nationally-recognized agency providing weather data over a period of at least the ten most recent years.

C.2.2.1 Annual, monthly, and peak rainwater data

The following data can be utilized to determine the site rainwater yield:

a) average (or minimum/maximum) annual rainfall, mm (in);

b) average (or minimum/maximum) monthly rainfall, mm (in), noting the month and year; and

c) peak rainfall event in the last five years (or minimum/average), measured as total rainfall and rainfall per hour, mm and mm/h (in and in/h).

Note: *~~Monthly p~~Peak~~s~~ rainfall can differ within a small region depending on the site location.*

Rationale

Outdated data may not be the most useful, especially with changes to climate and weather patterns. It may also be pertinent to add a notation regarding climate change projections that can be included or used to aid in planning system longevity. This can get pretty complicated. *The note is moved since all data can vary greatly over short distances, depending on topography, wind pattern differences, etc.*

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C.2.2.2 Annual rainwater yield *(as example: see also C.2.2.3 and C.2.2.4)*

C_{abs} = rainfall abstraction associated with absorption and wetting of surfaces, m (ft)
Note: *Annual C_{abs} can be estimated by multiplying the abstraction [in m (ft)] per event by the number of rainfall events per year. C_{abs} typical values are between 24 and 72 mm (0.96 and 2.88 in) per year*

Rationale

For statements such as these in a national standard:

- this section can be misleading, unless there is source information that can be obtained to support it. How is the abstraction per rainfall determined? And is a long, slow rainfall equivalent to a short, intense rain event?

- source information would be helpful. There are a lot of variables in abstraction: rainfall intensities, duration, and frequency; temperature; material of the collection surface; and estimation of the severity or abundance of contaminants to be removed.

The units (mm and in) do not match the variables (m and ft) of the calculation, a conversion is required.

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mm / 1000 = m; in / 12 = ft This also applies in C.2.2.2, C.2.2.3, and C.2.2.4

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Proposed Additions and Alterations

C.2.2.3 Monthly rainwater yield

$$MRY = (MR - C_{abs} - F_{abs})\,AC_wF$$

F_{abs} = rainfall abstraction associated with pre-storage filtration or first-flush diverter, m (ft)
Note: *Monthly F_{abs} can be estimated by multiplying the abstraction [in m (ft)] by the number of rainfall events per month. F_{abs} typical values are between 4 and 16.5 mm (0.17 and 0.65~~0.4~~ in) per month. Consult the manufacturer or supplier to verify the F_{abs}*

F = efficiency of the pre-storage filter, %
Note: *F is typically 90%; however, the manufacturer or supplier should be consulted*

Rationale

Corrected conversion, using 25.4 mm per inch

Missing variable description for *F*

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C.2.2.2 Annual rainwater yield
ARY = annual rainwater yield, m_3 (ft_3)

C.2.2.3 Monthly rainwater yield
MRY = monthly rainwater yield, m_3 (ft_3)

C.2.2.4 Peak rainfall event yield
PRY = peak rainfall event yield, m_3 (ft_3)

C.2.2.5 Monthly output water demand
MOWD = output water demand, L (gal) per month

Rationale

Rainfall yield is calculated in cubic measure (m_3, ft_3), while demand is calculated in different units (L, gal).

A conversion is necessary to compare or complete the calculations in
C.2.3: Monthly (complex) assessment method

m_3 to L : $m_3 \times 1000 = L$
ft_3 to gal : $ft_3 \times 7.48$ = US gal $ft_3 \times 6.23$ = Imperial gal

Task Group Members

project no. **RH-21-01**
project title: **Proposed Amendments to 2018 Edition**
standard: **Rainwater Harvesting Systems**
submission date: **October 14th, 2021**

note: This proposal identifies deletions as text ~~strike through~~ and text additions as text underline

Standard CSA B805-18/ICC 805-2018
Standard Name Rainwater Harvesting Systems
draft no.: **1**
submission date: **10, 2021**
submitted by: **Ken Nentwig**

Proposed Additions and Alterations

C.2.2.5 Monthly output water demand

$$MOWD = RU + CU + IU + EC + OU$$

MOWD = monthly output water demand ~~storage~~, L (gal) per month

$$CU_{Hotel} = \frac{Water\ demand}{Person} \times \frac{Avg.\ population}{Room} \times Monthly\ room\ rental$$

'Monthly room rental' should be **'Monthly occupancy rate (%)'**

Rationale

- demand is not storage, the two cannot be equated

- terminology is more exact

Task Group Members

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Proposed Additions and Alterations

C.2.3 Monthly (complex) assessment method

C.2.3.1 General

The ~~output~~ water storage volume (available water) shall be determined by assessing rainwater collection and output water use on a monthly basis using the following equation:

1

$OWD_t = OWD_{t-1} + (MRY - MOWD)$ $AW_t = AW_{t-1} + (MRY_1 - (MOWD_1 X conversion))$

~~OWD_t~~ AW_t = monthly water ~~volume of rainwater~~ available in the storage tank ~~to meet output water demand~~ at the end of each month, m_3 (ft_3)

~~OWD_t~~ AW_t = *volume of available* ~~*excess*~~ *rainwater carried over from each calculation* ~~*month*~~*, m_3 (ft_3)*

Rationale

1. OWD (Output water demand) is used in C.2.2.5 as a measure of the demand, and is confusing used here in the context of a measurement of available water.

It is suggested that the calculations use terms consistent with the intent, and that **C.2.3.4 Calculation Method** be revised and/or rewritten for terms and for units.

2. Monthly output water demand (MOWD) is calculated in L (gal) and will not work in this equation without non-listed conversions being required (see a previous page).

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m_3 to L : **m_3 x 1000 = L** ft_3 to gal : **ft_3 x 7.48 = US gal** or **ft_3 x 6.23 = Imperial gal**

Note that **C.2.3.4 Calculation Method** uses only 'L' as the units for calculation.
Water volume in a tank is not normally calculated in ft_3 but in L or gal. It is suggested that the calculations recommended in the standard be consistent in the units being used. (see C.2.2.2 ARY, C,2,2,3 MRY, C.2.2.4 PRY, C.2.3.1, C.2.3.4)

3. EXCESS rainwater is referenced in C.2.3.4 c) as OVERFLOW, and in both C.2.3.1 and C.2.3.4 e) as AVAILABLE/RESIDUAL in the tank. Using AVAILABLE (or RESIDUAL) when referring to the tank volumes, and EXCESS for overflow volumes, makes more sense and provides continuity.

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Proposed Additions and Alterations

C.2.3.4 Calculation method

This method calculates the volume of rainwater available in the storage tank to meet the output water demand on a monthly basis for a period of one year. (AW = available rainwater, (units)
The equation [AW_t ~~OWD_t~~ = AW_{t-1} ~~OWD_{t-1}~~ + (*MRY* – (*MOWD x conv)*)] is repeated for each month to identify whether sufficient rainwater remains in the storage tank, ~~to meet monthly output water demands throughout the year~~ based on the maximum storage capacity available, to meet output water demands (OWD) and monthly rainwater yield (MRY) as follows:

a) For the first month, assume that the volume of rainwater carried over from previous months is 0 (L, (gal), m3, (ft3)) so that $AW_{month\ 1}$ = 0 + (*MRY* - (*MOWD x conv)*). Needs to be clarified first

b) Estimate a storage tank volume as a starting point to meet the output water demand. If the value for AW_t exceeds the estimated storage volume, then the excess is assumed to overflow from the rainwater storage tank.

c) For month two, use the value for $AW_{Month\ 1}$ for AW_{t-1}; therefore, $AW_{Month\ 2}$ = $OWD_{Month\ 1}$ + (*MRY* - (*MOWD x conv)*).

d) Perform the AW_t calculation for all of the months.

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Note: *Values greater than the tank storage volume indicate overflow, while positive values less than the tank storage show that there is available rainwater remaining in the tank at the end of a month, whereas negative values indicate a deficit for the month. The actual AW_t cannot be greater than the tank storage volume or less than zero - use 'zero', 'max', or positive volume values as AW_{t-1} in the next month's calculation.*
NOTE: After each twelve-month run-through, adjust $AW_{month\ 1}$ to equal the $AW_{month\ 12}$ volume (see a)).

e) Repeat these calculations for all months using a different storage volume capacities until AW_t is no longer negative for any month, indicating that there is enough supply each month to meet the demands.

f) If it is not possible to obtain a zero or positive value for AW_t, this indicates that the
- output water demand is too high, or
- the monthly rainwater yield too low, or
- the storage volume too small to capture and hold sufficient water to meet the demands.

g) Adjusting output water demand or storage volume (see e)) or catchment area to meet water demand. Once all available rainwater is harvested, no increase in tank storage size will change the results, and a deficit situation may be inevitable.
Note: *OVERFLOW is the excess water greater than the storage tank volume; DEFICT shows the need for subsidy from an alternative source.*

Rationale

- the use of OWD as the available water is confusing (previously explained)
- awkward wording and simplifications

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C.2.3.4 Calculation method

This method calculates the volume of rainwater available in the storage tank to meet the output water demand on a monthly basis for a period of one year.
The equation [$AW_t = AW_{t-1} + (MRY - (MOWD \times conv))$] is repeated for each month to identify whether sufficient rainwater remains in the storage tank, based on the maximum storage capacity available, to meet output water demands (OWD) and monthly rainwater yield (MRY) as follows:

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a) For the first month, assume that the volume of rainwater carried over from previous months is 0 (L, (gal), m3, (ft3)) so that $AW_{month\ 1} = 0 + (MRY - (MOWD\ x\ conv))$. Needs to be clarified first

b) Estimate a storage tank volume as a starting point to meet the output water demand. If the value for AW_t exceeds the estimated storage tank volume, then the excess is assumed to overflow from the rainwater storage tank.

c) For month two, use the value for $AW_{Month\ 1}$ for AW_{t-1}; therefore,
$AW_{Month\ 2} = AW_{Month\ 1} + (MRY - (MOWD\ x\ conv))$.

d) Perform the AW_t calculation for all of the months.

Note: *Values greater than the tank storage volume indicate overflow, while positive values less than the tank storage show that there is available rainwater remaining in the tank at the end of a month, whereas negative values indicate a deficit for the month. The actual AW_t cannot be greater than the tank storage volume or less than zero - use 'zero', 'max', or positive volume values as AW_{t-1} in the next month's calculation.*

NOTE: After each twelve-month run-through, adjust $AW_{month\ 1}$ to equal the $AW_{month\ 12}$ volume (see a)).

e) Repeat these calculations for all months using a different storage volume capacity until AW_t is no longer negative for any month, indicating that there is enough supply each month to meet the demands.

f) If it is not possible to obtain a zero or positive value for AW_t, this indicates that the
- output water demand is too high, or
- the monthly rainwater yield too low, or
- the storage volume is too small to capture and hold sufficient water to meet the demands.

g) Adjust output water demand or storage volume (see e)) or catchment area to meet water demand. Once all available rainwater is harvested, no increase in tank storage size will change the results, and a deficit situation may be inevitable.

Note: *OVERFLOW is the excess water greater than the storage tank volume; DEFICT shows the need for subsidy from an alternative source.*

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Proposed Additions and Alterations

C.2.4 Computational method (continuous)

Rationale

This relates to a previous item, **C.2.1.4 Computational assessment method,** which references C.2.4.

Differentiating between the item titles yet keeping them comparative.

Task Group Members

Amendment Proposal

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Proposed Additions and Alterations

C.5 Storage loss volume

$$D = (OWD + FR + EI + SWPD)$$ 1

OWD = *output water demand, L (gal)*
FR = *dedicated fire reserve, L (gal)*
EI = *environmental initiative storage, L (gal)*
SW = *stormwater management (detention or retention),* ~~*m^3 (ft^3)*~~ *L (gal)* 2
PD = *dead space, % (typically 5 to 10%)*

Rationale

1. The units used are inconsistent with other variables in the equation - either change or indicate/offer a conversion factor.

2. Type - superscript (incorrect) vs subscript (correct), but a moot point now.

Task Group Members

Attachment #2

Proposal ballot 8199 – Comments Disposition Report.

Ballot Resolution Report - Proposed

CSA Ballot No. 8199

CSA file: B227

CSA B805/ICC 805

Rainwater harvesting systems – Proposed Amendments RH-20-01

CSA Ballot Closed: November 29, 2021

CSA TC Vote Breakdown (required affirmative votes to pass: 9): **Successful**

Affirmative:	9
Negative:	3
No Reply:	5

no.	member	vote	standard reference	comment(s), rationale, & proposed changes	ruling	resolution
1	Judy MacDonald	Negative with Comment	3.1 Definitions, Ultraviolet Transmittance	I disagree with the addition of "the clarity or turbidity of" to the definition for UV transmittance. UVT is a measure of the organics, colloidal solids and other material in the water which absorb or scatter the UV light. This is different from water clarity or turbidity. UVT is an important criterion to ensure adequate and effective UV disinfection. The definition should not be confounded with water clarity or turbidity which are different measures for the reasons given in the rationale for the proposed change. Also, it is important that stakeholders not think they can submit water clarity or turbidity data in the absence of UVT data. I would suggest simply saying is a "measure of water quality" instead of the proposed change. *Ultraviolet transmittance (UVT) — the measure of the fraction of incident germicidal ultraviolet light remaining after passing*		

				through 1 cm (0.39 in) of sample water expressed as a percentage of the transmission through pure water. *Note: This value is a measurement of the ~~clarity or turbidity of~~ water quality. For example, water from a metal roof after a 350-micron filter might have a UVT of 90%. As water quality changes, the UVT% of said water also changes.*		
2	Pieter DeVries	Affirmative with Comment	3.1	The parameters clarity and turbidity have no relationship to the UVT of the water source. UVT degradation in water is mostly due to organic content of the water. Organics often have a color component but can also be visually clear. Turbidity, unless it is extremely high has no effect on a UVT measurement. UVT measurements are a useful to indicate an increase in the organic content of the stored water. Increases in organic content are due to the tannin's produced by decaying vegetative matter in the storage tank over time. The presence of organics has a direct negative influence on the performance of UV disinfection systems.		
3	Chris Despins	Affirmative with Comment	3.1 Definitions	Proposed amendment on page 2 of 32: I don't see why the new term "Debris excluder" is needed. I think inlet pre-filter already covers this definition. Recommend not including the addition of this term. *Debris excluder - a device or method for removal of debris carried from the collection surface by filtering the rainwater through a screen. The debris excluder is normally the first filter or screen in the rainwater system.* Some of the modifications to the inlet pre-filter look good, but I'm not sure what		

				"...or method (if used)" means. Other additions to the inlet pre-filter definition look good other than the text I have highlighted. *Inlet pre-filter — a device installed on the rainwater conveyance pipe prior to the first-flush diverter device ~~or method (if used)~~, and prior to the primary storage vessel on a rainwater system (see Debris filter).* *Note: An inlet pre-filter is intended to mitigate the introduction of, e.g., vermin, leaves, sticks, needles, tree fruit, bark, moss, or any other unwanted debris or roof contaminant that could enter the system.* Proposed amendment on page 4 of 32: I don't see the need of identifying where the outlets go. Recommend not including this proposed amendment. *Rainwater outlet — the point of entrance at the storage tank into the distribution system, ~~to a pump inlet, to the overflow piping, or to other system components (e.g. slow-release orifice for storm water management).~~*		
4	Mike Warren	Negative with Comment	3.1 Definitions	Definitions - "Rainwater Outlet" - this needs to be re-written. the definition starts with the word "entrance" when trying to define an outlet. Definitions - "UVT - correct wording for describing what UVT is ..... the value is a measurement of "how well UV light moves through the given water sample" It does not measure the turbidity or clarity of water. Technically turbidity and clarity can/may have an effect on UVT but not always.		
5	Penh Tov	Affirmative with Comment	3.1	Rainfall Abstraction * reject addition of “and wetting of” * Okay with addition of “pre-storage filtration and” * Reject deletion of “first flush diverters usually collect the first 2mm (0.08in) of		

				rainfall and prevent it from reaching the tank." *Rainfall abstraction — a measure of the amount of rainfall that is lost from absorption into ~~and wetting of~~ roof surfaces, or the amount of water that is lost due to the operation of pre-storage filtration and first-flush diverters* *Note: First-flush diverters usually collect the first 2 mm (0.08 in) of rainfall and prevent it from reaching the tank~~.~~ Rainfall abstraction is usually expressed in mm or inches.*		
6	Mike Warren	Negative with Comment	5.1.12.2	5.1.12.2 Construction Documents - We would not want the standard to promote the use of example documents or example drawings for construction documents. *The following completed or pertinent examples of documents with an application for permit shall be provided as required to the authority having jurisdiction ~~with an application for permit~~:*		
7	Joe Rogers	Affirmative with Comment	6.7.5.1	I would strikeout the OR in front of damage to the system. *Alerts shall be provided for critical control points identified by the WSP to indicate when the rainwater harvesting system is operating outside design parameters but not causing a hazard to life, health, ~~and~~ safety, ~~or~~ damage to the system or to related or adjacent structures*		
8	Chris Despins	Affirmative with Comment	6.7.5.1 Alerts	Proposed amendment on page 11 of 32: I'm not sure why alarms should be extended to adjacent structures. That seems outside the scope of this standard. Recommend not including this proposed amendment. *Alerts shall be provided for critical control points identified by the WSP to indicate when*		

				the rainwater harvesting system is operating outside design parameters but not causing a hazard to life, health, ~~and~~ safety, ~~or~~ damage to the system or ~~to related or adjacent structures~~		
9	Mike Warren	Negative with Comment	6.7.5.1 Alerts	6.7.5.1 Alerts - I do not accept the wording "or to related or adjacent structures" Leave this wording out as there is no sensor or device or method of measurement for a piece of machinery to make a decision on whether or not damage to structures may occur. It is too far out of scope for the standard. *Alerts shall be provided for critical control points identified by the WSP to indicate when the rainwater harvesting system is operating outside design parameters but not causing a hazard to life, health, ~~or~~ safety, ~~or~~ damage to the system or ~~to related or adjacent structures~~*		
10	Mike Warren	Negative with Comment	6.7.5.2 Alarms	6.7.5.2 Alarms - I do not accept the wording "or to related or adjacent structures" Leave this wording out as there is no sensor or device or method of measurement for a piece of machinery to make a decision on whether or not damage to structures may occur. It is too far out of scope for the standard. *Alarms shall be provided for critical control points identified by the WSP to indicate when the rainwater harvesting system is operating outside the design parameters and potentially causing a hazard to life, health, ~~and~~ safety, or damage to the system or ~~to related or adjacent structures.~~*		
11	Ken Nentwig	Affirmative with Comment	Table 7.1	The proposal actually asks for more clarification for the roof materials - some terms are general, some are lumped with potentially different materials or applications, some seem incomplete. How discussion on this type of proposed		

				amendment takes place is unclear, and applies to several more areas (separate comments).		
12	Chris Despins	Affirmative with Comment	Table 7.1	Questions raised on Page 13 of 32: This is outside of my area of expertise, I have no opinion on whether any amendments are required based on the questions posed on this page.		
13	Penh Tov	Affirmative with Comment	Table 7.1	Committee may want to clarify the differences between material.		
14	Penh Tov	Affirmative with Comment	7.1.2	Reject “that is” insertion Okay with the rest. *b) ~~that is~~ subject to pedestrian access, or is from a vegetated roof, or intercepted by ground level surfaces (e.g., ~~vegetative roofs~~, pedestrian surfaces, porous pavement, landscape runoff, paved parking, and street, freeway and shoulder areas on roadways), shall be considered stormwater runoff.*		
15	Justin DeWitt	Affirmative with Comment	7.1.2	Redundant addition highlighted in yellow *Rainwater that is ~~intercepted by roof material and~~ a) intercepted by roof material and not subject to pedestrian access, except for maintenance purposes, shall be considered roof runoff; and b) that is subject to pedestrian access, or is from a vegetated roof, or intercepted by ground level surfaces (e.g., ~~vegetative roofs,~~ pedestrian surfaces, porous pavement, landscape runoff, paved parking, and street, freeway and shoulder areas on roadways), shall be considered stormwater runoff.*		
16	Ken Nentwig	Affirmative with Comment	7.1.5	Further discussion and clarification on the 'except evaporative cooling' phrase, as outlined.		

17	Penh Tov	Affirmative with Comment	7.1.5	Reject deletion of “equipment and appliances mounted…..rainwater harvesting system” and insertion of roof runoff shall be collected. Reason: there could be other equipment on the roof which is allowed so long as contaminates associated with that equipment does not discharge/drip onto the roof. For clarification from committee needed about what “excluding evaporative cooling” means.		
18	Ken Nentwig	Affirmative with Comment	Figure A.1	The format and flow of information of the table, and source(s) of the information, could be discussed.		
19	Justin DeWitt	Affirmative with Comment	Figure A.1	What is being proposed here?		
20	Penh Tov	Affirmative with Comment	Figure A.1	Reject suggestion. Source is from Technical Committee. Based on other particle size distribution charts, the direction is small to large (left to right) not large to small.		
21	Chris Despins	Affirmative with Comment	C.2.2.2 Annual rainwater yield	Questions raised on Page 22 of 32: I helped to write this section and can help track down the source(s) for this information. I recommend that further discussion be held on this item prior to amending the standard.		
22	Penh Tov	Affirmative with Comment	C.2.2.2	Response to comment: The note in question is providing a simplified example where intensity and duration is irrelevant as you are looking at the annual rainfall data. Chris Despin to provide source on 24 and		

				72mm. These may be based on typical Stormwater analysis/observations. Industry standard for referring to rainfall depth is mm and in not m and ft. To do calculation, user need to do their own conversion unless it standard to provide this level of detail in a standard. CSA to advise.		
23	Penh Tov	Affirmative with Comment	C.2.2.5	Reject insertion of “monthly” as it is already defined with in the definition. Revise to “MOWD = output water <u>storage</u> demand ~~storage~~, L (gal) per month Accept replacement of “monthly room rental” to “monthly occupancy rate (%)”		
24	Penh Tov	Affirmative with Comment	C.2.2.2 to C.2.2.4	Response to comment: Stormwater analysis in industry calculate rainfall yield as m3 (ft3), and demand as volume in L (gal). To do calculation, user need to do their own conversion unless it standard to provide this level of detail in a standard.		
25	Chris Despins	Affirmative with Comment	C.2.3. Monthly (complex) assessment method	Proposed amendments on Page 26, 27, 28 29, 30 of 32: I am supportive of the proposals put forward in this section to improve clarity of this methodology. It is a bit difficult to review the 'clean' version as presented as it does not follow the strike through and underline convention for the marked-up text. I would like to review the clean version separately to review this proposal before fully accepting the proposed amendment		
26	Penh Tov	Affirmative with Comment	C.2.3.1	Reject formula change. Reason: terminology is specify to stormwater industry.		

				Reject adding conversion to the formula. Users should do their conversions accordingly unless it is standard to provide this level of detail in a standard. CSA to advise. Response to comment on Water volume: calculations is in ft3 because this is typically how is calculated due to precipitation units provided by weather stations and is an industry standard. User can convert to L (gal) accordingly. The formula in C.2.3.1 already define MOWD in m3 (ft3) which does mean the user has to do their own conversion.		
27	Penh Tov	Affirmative with Comment	C.2.3.4	Reject change. The proposed modifications changes the intent of the section and terms for equation. Conversion not necessary as the units are already defined for the equation. User needs to make their own conversion.		
28	Penh Tov	Affirmative with Comment	C.2.4	Reject insertion of “continuous” to the section name. Reason: computational method is already defined as and known to be a continuous process. The term is commonly referred in industry as computation method and not computational method (continuous). Computational assessment method is talking about the method in which it is assessed, ie. computational method.		
29	Ken Nentwig	Affirmative with Comment	C.2.2.2 to C.2.2.5	The calculations in these sections, and sub sequesnt sections, do not carry the same information, units, or acronyms		

				throughout. Some are confusing acronyms, and many calculations mix units of measure. This also applies to C.4 Stormwater management (detention) volume, although no specific proposals have been listed in the original submission of proposed amendments or changes.		
30	Doug Pushard	Affirmative with Comment	General	Would like to align this standard and the graywater standard in the next round. Both are alternative water sources. Both can be used for irrigation and toilets. I would imagine by the next standard round for graywater it's indoor water use will increase. We will then have two standards for alternative water sources, but very different approaches to water use.		
31	Troy Vassos	Negative with Comments	General	Many of the proposed changes are editorial in nature and do not materially change the standard in terms of correcting an error or adding materially to clarification. Others are not appropriate (e.g. C.2.2.2 stating a unit conversion is required "mm / 1000 = m; in /12 = ft"). Many changes are not appropriate at all. To consider the propose amendments would at least require a sub-committee review. Too many changes have been proposed for a ballot process to be time-effective for committee members to address.		

Notes:

1. CSA Rulings are: **P** = persuasive, **NP** = non-persuasive, **NG** = non-germane and **WD** = comment withdrawn
2. Deletions are marked as text ~~strike through~~ and additions as text underline