	Friday, January 12		
	Dunes I-II	Sandpiper I	Sandpiper II
9:00 AM	Codes & Standards 9:00 - 10:00 Collins		
9:15 AM			
9:30 AM			
9:45 AM			
10:00 AM	Code Development 10:00 - 11:00 Hickman		
10:15 AM		TDP-1 (Peel Test) 10:15 - 11:00 Childs	
10:30 AM			Resiliency 10:30 - 11:15 Ibanez
10:45 AM			
11:00 AM	DORA™ Listing 11:15 - 11:45 Collins	RD-1 11:00 - 11:45 Donovan	
11:15 AM			
11:30 AM		VR-1 Review 11:30-12:00 Darsch	
11:45 AM			
12:00 PM	Lunch		
12:15 PM			
12:30 PM			
12:45 PM			
1:00 PM	DORA™ Fire 1:00 - 1:45 Collins	ADT-1 Collins/Eschhofen 1:00-1:30	
1:15 PM			
1:30 PM		Education 1:30 - 2:00 Chamberlain	
1:45 PM	DORA™ Edge 1:45 - 2:30 LeClare		
2:00 PM		Digital Content & Communications 2:00 - 2:30 Montoya	
2:15 PM			
2:30 PM	PVC Environmental 2:30 - 3:30 Stanley	RP-14 2:30 - 3:00 Mader	PRO Guide 2:30 - 3:00 Collins
2:45 PM			
3:00 PM		Standards Library Template 3:00 - 3:30 Mader	
3:15 PM			
3:30 PM	Technical Committee 3:30-4:15 Childs		
3:45 PM			
4:00 PM			
4:15 PM			
4:30 PM			
4:45 PM			
5:00 PM			

SPRI
ADT-1
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
1:00 p.m.

AGENDA

I.	Call to Order	N. Eschhofen and C. Griswold
II.	Roll Call & sign in	
III.	Reading of SPRI Antitrust Statement	
IV.	Discuss feedback received on draft	
V.	Discuss feedback on ballot	
VI.	Adjournment	

Task Force Objective:
– Nick Eschhofen, TruFast, Colin Griswold, OMG
start date 04/2023 budget: $0

This Task Force will develop a consensus standard /for a 6x6 adhesive delamination tests.

Ballot Name:	Precanvass Interest Survey
Open Date:	09/05/2023 at 01:00:00 AM EDT
Close Date:	10/05/2023 at 11:59:59 PM EDT
Note:	This ballot is closed.

Item #1 - Will you participate in the review and approval of the proposed SPRI/FM ADT-1 document as an ANSI Standard?

ITEM No.	SENT	RETURNED	%RETURNED
1	22	16	72.73%

Producer	Other Producer	User	General Interest	I do not wish to participate.
7	4	2	3	0
43.75%	25.00%	12.50%	18.75%	0.00%

Voter Email	Voter Name	Voter Role	Answer	Section	Company
chadwick@tksebastian.com	Chadwick Collins	Official Voter	General Interest		SPRI
davelee@ix.netcom.com	David Roodvoets	Official Voter	General Interest		DLR Consulting
todd.burroughs@intertek.com	Todd Burroughs	Official Voter	General Interest		Intertek
mikeg@flexmembranes.com	Michael Giangiacomo	Official Voter	Other Producer		Flex Membrane International
darsch.michael@us.sika.com	Mike Darsch	Official Voter	Other Producer		Sika Sarnafil Inc.
stephanie.kiriazes@holcim.com	Stephanie Kiriazes	Official Voter	Other Producer		Holcim
stephen.childs@gaf.com	Stephen Childs	Official Voter	Other Producer		GAF
cmader@blueridgefiberboard.com	Christopher Mader	Official Voter	Producer		Blue Ridge Fiberboard
ajanni@duro-last.com	Al Janni	Official Voter	Producer		Duro-Last
neschhofen@trufast.com	Nick Eschhofen	Official Voter	Producer		TruFast
smoskowitz@atlasroofing.com	Steven Moskowitz	Official Voter	Producer		Atlas Roofing Corporation
brian.chamberlain@carlisleccm.com	Brian Chamberlain	Official Voter	Producer		Carisle Construction
cgriswold@omginc.com	Colin Griswold	Official Voter	Producer		OMG
tim.mcquillen@jm.com	Tim McQuillen	Official Voter	Producer		Johns Manville
stancconsult@comcast.net	Stan Choiniere	Official Voter	User		StanCConsulting
drhawn@drhroofsolutions.com	David Hawn	Official Voter	User		Dedicated Roof & Hydro-Solutions
david.alves@fmapprovals.com	David Alves*	Official Voter	User		FM Approvals
flonja.shyti@nrc-cnrc.gc.ca	Flonja Shyti	Official Voter			National Research Council of Canada
info@spri.org	Linda King	Administrator			SPRI
cmeyer@seamancorp.com	Chris Meyer	Official Voter			Seaman Corp
m.ennis@mac.com	Mike Ennis	Official Voter			SPRI
luisc@nemoetc.com	Luis Cadena	Pending			Nemo
areynolds@benchmark-inc.com	Andrew Reynolds	Official Voter			Benchmark
joel.king@ibroof.com	Joel King	Official Voter			
zpriest@pricmt.com	Zach Priest	Official Voter			

*added 10/10/2023 - FM invited to participate

SPRI
Code Development
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
10:00 a.m.

AGENDA

I.	Call to Order	A. Hickman
II.	Roll Call & Reading of SPRI Antitrust Statement	
III.	Review Code Development Task Force Objectives	
IV.	ICC Code Development Process Update (Proposals and Strategy for 2027 edition)	
V.	ICC Code Commentary (2024 edition)	
VI.	IAPMO/UMC	
VII.	2024/2027 IECC Update	
VIII.	ASHRAE update (90.1 and 189.1)	
IX.	Florida Code Development update	
X.	Code Trends	
XI.	Adjournment	

Task Force Objective:
– Amanda Hickman, SPRI
start date 10/2010 budget: $0

The objective of the Code Development Task Force is to develop and advocate for safe, technically correct, and easily enforced code language while also promoting the goals of the SPRI's membership.

SPRI
Codes & Standards
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
9:00 a.m.

AGENDA

I. Call to Order — C. Collins

II. Roll Call & Reading of SPRI Antitrust Statement

III. Review Objectives of Task Force

IV. Reports & Updates
- a). Industry Association Report
- b.) Industry initiatives Report
- c.) Code updates
- d.) Standards Updates

V. Unfinished Business
- a.) Puget Sound update

VI. New Business, open to the floor

VII. Adjournment

Task Force Objective:
– Chadwick Collins, SPRI
The objectives of the Codes & Standards Task Force (CSTF) are to provide timely and pertinent information on codes & standards that may affect the sale and use of sheet membrane roofing systems and the components used in those systems. The CSTF will respond promptly to issues relating to codes & standards based on the consensus of the SPRI membership.

SPRI
Digital Content & Communications
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
2:00 p.m.

AGENDA

I.	Call to Order	R. Montoya
II.	Roll Call & Reading of SPRI Antitrust Statement	
III.	Blog Update and Review	
IV.	Update blog list and implement a blog calendar and assignment	
V.	Website update – discussion	
VI.	Adjournment	

Task Force Objective:
– Rick Montoya, Acme Cone Company

The objective for this task force is to build SPRI's digital presence through the regular posting of blogs to the SPRI website, post and share digital content through LinkedIn and Facebook, soliciting blog content.

Title	Posted	Writer
Making Roofing Santa Safe	12/21/2023	Chadwick & Brad
Wind Design Seminar: Unlocking the Secrets of Building Resilience	9/25/2023	Michelle Jones
MPO Standard	9/7/2023	Michelle Jones
EPDs	7/31/2023	Sam Everett
VF-1	6/23/2023	Michelle Jones
A conversation with Chadwick Collins	5/24/2023	Sam Everett
Protecting the Roof From Human Impact	3/6/2023	Brian Randall
NRCC Announces New Governance Model for Harmonized Construction of Code Development System	2/23/2023	Michelle Jones
SPRI 2023 Annual Business Conference: "Push It Up!"	2/1/2023	Michelle Jones
Single Ply Industry Resilience and Future Sustainability	1/4/2023	Sam Everett

SPRI
DORA Edge Securement
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
1:45 p.m.

AGENDA

I. Call to Order — B. LeClare

II. Roll call and reading of SPRI antitrust statement

III. Review of Objective Statement

IV. Recap of previous meetings and findings:
   a) October 17th Task Force Meeting in Chicago
   b) November 11th Teams meeting
   c) Findings on non-SPRI member participation

V. Review of possible modifications to DORA Program Guidelines (see attached)
   a) Can guidelines written for Roof Assemblies incorporate Roof Edge?
   b) Should it be broadened to incorporate other tested roof products or systems

VI. Discussion of how to document, describe and charge for field roll formed products
   a) Does a product from each roll former need to be tested?
   b) Is testing applicable to all roll formers using dies sets equal to those used to produce the tested product.

VII. Adjournment

Task Force Objective:
– Bob LeClare, ATLAS International, Inc.
start date 06/2023 objectives approved 11/09/2022 budget: $0

The objective of this Task Force is to add edge securement requirements to the DORA® Listing program.

Return to Schedule

Directory of Roof Assemblies (DORA)

Program Guidelines

Approved April 23, 2021

Proposed Modifications

Table of Contents

1.0 General

1.1 The purpose of the Directory of Roof Assemblies (DORA) Program ("Program") is to provide designers, code officials, roof consultants, contractors, and other interested parties with a database of roofing systems tested in accordance with standards referenced as part of Chapter 15 of the International Building Code (IBC).

1.2 The Program is wholly owned by SPRI. SPRI is responsible for the establishment of the policies of the Program including an independent third-party management of the Program including its overall direction, control, and implementation. To do this, SPRI will create and utilize, as it deems necessary and otherwise helpful: (1) committees including, but not limited to, a Listing Oversight Committee and a Dispute Resolution Committee; and (2) retain outside professionals and other service providers.

1.3 SPRI has elected to engage a Program Manager to function as the Program's third-party administrator. As part of its administrative duties, the Program Manager is responsible for developing, populating and maintaining the DORA Database ("Database").

1.4 In order to provide a credible listing service to the roofing industry, these Program Guidelines ("Guidelines") govern the requirements for roofing system submittals and supporting documentation; submittal validation; listing maintenance; and listing challenges and appeals. The Guidelines are part of an independent third-party listing program, and these Guidelines constitute part of the agreements entered into by SPRI, the Program Participants, and the Program Manager.

1.5 The current scope of the Guidelines covers wind uplift, external fire and impact performance only specified within Chapter 15 of the IBC 2018 and 2021. The requirements in these Guidelines have been developed through a consensus-based approach.

2.0 Definitions

- End User – Individuals such as consultants, architects, and authorities having jurisdiction utilizing the Database for searching and identifying roofing system performance.

- Data Extension – The use of comparative test data to allow alternate roofing system components to be included in a Listing without conducting testing in accordance with Section 3.7.

- Dispute Resolution Committee – A neutral party, established by SPRI, providing arbitration on appeals, and operating under their defined procedures and rules, as determined by SPRI.

- Listing Owner – Entity submitting roofing systems for listing in the Database and providing the supporting documentation for the system's performance.

- SPRI Listing Oversight Committee – The Committee, established by SPRI that oversees the guidelines, operations and activities of the Program and Database, as determined by SPRI.

- Program Manager - The administrator of the Program and Database.

- Recognized Component Manufacturer (RCM) - A company that manufactures components that are utilized in roofing systems that are listed in the Database.

- Roofing Systems – An integrated group of components that are tested for performance, which includes, but is not limited to, roof assemblies, perimeter edge systems, and external gutter systems.

- Listing - A listing is a system of recognized components that meet the performance ratings addressed by the Listing Program.

- Validation – The technical review of the testing data and supporting documentation for establishing a listing. Validation must be conducted by a Validator, as set forth in the Program.

- Validator - ISO 17065-accredited Certification Body or a Licensed Professional Engineer, with the applicable expertise in the products and performance criteria being evaluated, conducting the technical engineering review of the listing submittal.

3.0 General

3.1 Overview

3.1.1 The Program provides a publicly accessible and searchable web-based database of roofing systems. Four distinct groups will utilize the DORA Program database: Listing Owners; Recognized Component Manufacturers (RCMs), the Program Manager; and the End Users. Each of the four groups requires unique settings, accessibility, and safeguards.

3.1.2 Listing Owners and RCMs shall enter into an agreement with the Program Manager for the participation in the Program in accordance with these Guidelines and requirements.

3.1.3 A listed roof assembly consists of all the components in the roof assembly including, but not limited to, the deck, insulation, covering and securements. In general, components of an assembly must be manufactured by an RCM, as set forth in Section 3.6.

3.1.3.1 The use of generic components, such as, but not limited to, asphalt and polyethylene sheeting, will be identified as generic in the database, and not subject to the RCM requirements.

3.1.4 A listed perimeter edge system consists of all the components in a fascia or coping system including, but not limited to, cleats, clips, fasteners and covers.

3.1.5 A listed external gutter system consists of all the components in a gutter system including, but not limited to, straps, brackets, gutter trough, and fasteners.

3.1.6 To add a roofing system to the Database, a Listing Owner submits a roofing system referencing supporting documentation (listing record) to the Program Manager in accordance with the system submittal requirements. The system supporting documentation may be in the form of qualified test reports or qualified existing listings. During this period the listing submittal is pending in the Database while under review.

3.1.7 During review, the listing submittal's supporting documentation and RCM quality control requirements are verified by the Program Manager in accordance with the governing submittal requirements. Following a successful verification, the listing submittal is granted approval and is published by the Program Manager on the Database. The listed system is accessible to the public through parametric searches and applicable category selections.

3.1.8 The Listing Owner maintains its listing by payment of applicable fees and periodic verification that there have been no changes that adversely affects the performance of the listed system. The Program Manager maintains the active listing in the Database.

3.2 Eligibility

3.2.1 Eligible Listing Owners must have ownership or legal release of the listed systems supporting documentation and performance data.

3.2.2 Each RCM that supplies components of a listed roofing system must provide proof of satisfactory quality control inspections conducted by a third-party Quality Control Agency at each of their recognized plant locations.

3.2.2.1 The Quality Control Agency performing the inspections must be accredited by the International Accreditation Service (IAS), or similar accreditation body, as complying with ISO Standard 17020 or ISO 17065 performing inspections on its own behalf.

3.2.3 Listing entries for another party are acceptable when the Listing Owner grants written permission for the use of its data.

3.3 Quality System Documentation

3.3.1 All RCMs shall maintain quality control documentation and a quality system to ensure that their participating products consistently meet the requirements of the Program. At a minimum, the quality control documentation shall satisfy the requirements as outlined in Section 2.0, Elements of the Quality System Documentation, contained in Acceptance Criteria for Quality Documentation (AC10), with the exception that Section 2.1.4 of AC10 shall be modified as follows: “The documentation shall indicate how the recognized product is to be identified in the field, including manufacturer’s name and product trade name, or identification as agreed upon through private labeling agreements.”; or satisfy the requirements as contained in other approved quality system documentation.

3.4 Program Manager Responsibilities

3.4.1 Enter into an agreement with the Listing Owners and RCMs for participation in the Program.

3.4.2 Conduct review of submittals.

3.4.3 Confirm that the minimum quality control inspection requirements at each RCMs recognized plant location are being met.

3.4.4 Enforce the provisions of this Listing Program as outlined in these Guidelines.

3.4.5 Maintain the Database.

3.4.6 Shall have the right to revise the program fee schedule after notification to, and approval from, SPRI and in conformance with the established contracts.

3.5 Listing Owner Responsibilities

3.5.1 Enter into an agreement with the Program Manager for participation in the Program.

3.5.2 Submit the necessary supporting documentation as required by the Guidelines.

3.5.3 Ensure supply of components and assemblies as good-faith reproductions of those tested and recognized in the assembly listing.

3.5.4 Notify the Program Manager of any changes to the listed system that adversely affects the performance.

3.5.5 Ensure that agreements are in place with RCMs for proper identification of components utilized in Listings.

3.5.5.1 Identification must be clear enough to allow the end user or authority having jurisdiction to adequately link the components to those identified on a Listing.

3.5.6 Pay all applicable fees that are part of the Program.

3.6 Recognized Component Manufacturer Responsibilities

3.6.1 The RCM must enroll its individual plant locations that manufacture components in the Program.

3.6.2 Each RCM must enter into an agreement with the Program Manager for participation in the Program.

3.6.3 Each RCM must maintain a quality system as described in Section 3.3.1 for each of its recognized plant locations.

3.6.4 Each RCM must provide proof of enrollment in a quality control inspection program per the requirements of Section 7.2 for each of its recognized plant locations

3.6.4.1 Proof of inspection may be through the submittal of inspection reports, inspection summary forms, or other equivalent documentation.

3.6.4.2 Documentation shall identify variances as a result of inspections and confirmation that variances have been resolved.

3.6.5 Each RCM shall supply a list of its manufactured components and private labels.

3.6.5.1 This information is uploaded to the secure portion of the Database and is only accessible to the specific RCM and the Program Manager.

3.6.5.2 All components in the Database will be accessible to the Listing Owners to select as part of their roofing systems.

3.6.6 As part of the ongoing compliance requirements, a RCMs failure to provide proof of inspections or resolution of variances shall result in the removal of the affected plant locations.

3.6.6.1 The Program Manager will provide notification to the non-compliant RCM prior to the removal of the RCM plant locations.

3.6.6.2 Following the notification, the Program Manager will allow 30 days for proof of compliance to the Program requirements to be submitted. If

inadequate proof is provided, notification of the plant's removal will be submitted to all the Listing Owners.

3.6.7 Pay all applicable fees that are part of the Program.

3.7 Applicable Test Standards

3.7.1 Wind uplift testing of roof assemblies must be conducted in accordance with FM 4474, UL 580, or UL 1897, as specified in Section 1504.3 of the IBC.

3.7.2 Fire testing of roof assemblies must be conducted in accordance with ASTM E108 or UL 790. In addition, fire-retardant-treated wood roof coverings shall be tested in accordance with ASTM D2898 or as specified in Section 1505.1 of the IBC.

3.7.3 Impact testing of roof assemblies must be conducted in accordance with ASTM D3746, ASTM D4272 or the "Resistance to Foot Traffic Test" in Section 5.5 of FM 4470, as specified in Section 1504.7 of the IBC.

3.7.4 Wind resistance testing of perimeter edge systems must be conducted in accordance with ANSI/SPRI/FM 4435/ES-1 as specified in Section 1504.5 of the IBC 2018 and 1504.6 of the IBC 2021.

3.7.5 Wind resistance testing of external gutter systems must be conducted in accordance with ANSI/SPRI GT-1 as specified in Section 1504.5.1 of the IBC 2021.

3.8 Reference Documents

3.8.1 International Building Code (IBC)©, International Code Council.

3.8.2 FM Standard 4474 American National Standard for Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures, FM Global, Johnston, RI.

3.8.3 Testing for foot traffic resistance shall be in accordance with *Test Procedure, Test Method for Determining the Foot Traffic Resistance of Roof Coverings and Insulation*, FM Approvals, LLC.

3.8.4 ASCE-7 Minimum Design Loads for Buildings and Other Structures, American Society of Civil Engineers, Reston, VA.

3.8.5 Standard Test Method for Fire Tests of Roof Coverings, ASTM E108

3.8.6 UL 580 Standard for Safety, Tests for Uplift Resistance of Roof Assemblies, Underwriters Laboratories Inc., Northbrook, IL.

3.8.7 UL 1897 Standard for Uplift Tests for Roof Covering Systems, Underwriters Laboratories Inc., Northbrook, IL.

3.8.8 UL 790 Standard Test Methods for Fire Tests of Roof Coverings, Underwriters Laboratories Inc., Northbrook, IL.

3.8.9 ICC-ES Acceptance Criteria for Quality Documentation (AC10).

3.8.10 ANSI/SPRI/FM 4435/ES-1 Test Standard for Edge Systems Used with Low Slope Roofing Systems, SPRI, Waltham, MA.

3.8.11 ANSI/SPRI GT-1 Test Standard for External Gutter Systems, SPRI, Waltham, MA.

4.0 Roofing System Submittal Requirements

4.1 Roof Assembly Contents

4.1.1 A complete list of all roof assembly combinations being submitted for consideration.

4.1.2 The components that make up each roof assembly including, but not limited to:

4.1.2.1 Covering;

4.1.2.2 Cover board;

4.1.2.3 Insulation;

4.1.2.4 Securements;

4.1.2.5 Pattern or layout of securements;

4.1.2.6 Air, vapor, or thermal barrier; and

4.1.2.7 Structural deck.

4.1.3 Each component in the assembly shall be identified by manufacturer/supplier and product trade name.

4.1.4 Documented wind uplift for each assembly.

4.1.5 Documented fire classification and tested slope for each assembly.

4.1.6 Documented Impact testing classification for each assembly.

4.1.7 Installation details shall only be required as necessary to properly describe the tested assembly.

4.1.8 The Listing Owner shall have the authority to decide on the content of the listing information, provided it complies with the Program Rules.

4.1.9 Only a description of the assembly and its components and the results of wind uplift testing shall be included in the listing's supporting documentation.

4.1.10 Supporting documentation, testing data, and proprietary information will not be publicly visible or accessible.

4.1.11 No additional product information or claims shall be included.

4.2 Perimeter Edge and Gutter System Submittal Requirements

4.2.1 A complete description of the system components with drawings showing installed configuration

4.2.2 Each component in the system shall be identified by material type and thickness.

4.2.3 Documented wind resistance(s) for each system configuration

4.2.4 The Listing Owner shall have the authority to decide on the content of the listing information, provided it complies with the Program Rules.

4.2.5 Only a description of the system and its components and the results of wind resistance testing shall be included in the listing's supporting documentation.

4.2.6 Supporting documentation, testing data, and proprietary information will not be publicly visible or accessible.

4.2.7 No additional product information or claims shall be included

4.3 Supporting Documentation

4.3.1 Listings in the Database may be supported by an existing listing, or by the necessary test reports and supporting information for the performance characteristics for which the listing is being sought.

4.3.2 Listings being supported by a current and valid existing listing from another

qualified product listing programs shall be accepted by the Program Manager without further validation.

4.3.2.1 Qualified product listing programs include, but are not limited to: 17065-accredited Certification Bodies; Dade County Florida; FM Approvals; ICC-ES; State of Florida; and UL, LLC.

4.3.3 It is the responsibility of the Listing Owner to notify the Program Manager in the event that a supporting listing is removed, voluntarily or involuntarily.

4.3.3.1 In the event that a supporting listing is removed, the Listing Owner may submit supporting documentation to maintain its DORA Listing.

4.3.4 For submittals not supported by an existing listing, testing data must fully comply with these Guidelines and provide the information necessary for validation.

4.3.5 The Program Manager may request additional information as part of the verification process of a listing application.

4.3.6 All documents shall contain the Listing Owner's name, document or reference number, and date.

4.3.7 All submittal information shall be provided in the English language.

4.4 Testing Laboratory Requirements

4.4.1 In the supporting documentation for each roofing system, the independent testing laboratory, at the time of testing, must have been accredited as complying with ISO Standard 17025. The scope of accreditation for the laboratory, at the time of testing, must have also included the specific tests conducted in the system submittal.

4.5 Validation Requirements

4.5.1 system submittals, not supported by an existing listing, must include a validation (technical engineering review) of the supporting documentation and the systems performance.

4.5.2 Validation must be conducted by an ISO 17065-accredited Certification Body or by a Licensed Professional Engineer with the applicable expertise in the products and performance criteria being evaluated.

4.5.3 Listing Owners cannot serve as Validators.

4.5.4 The validation shall ensure that the supporting documentation and performance fully comply with the applicable test standards.

5.0 Listings

5.1 Listing Entries

5.1.1 Listing Owners shall be responsible for entering the system information directly into the Database, as well as uploading the necessary supporting documentation. The Program Manager shall verify the submittal for accuracy.

5.1.2 All listings will remain in an unpublished, pending status, and not accessible to the public, until verification by the Program Manager is completed.

5.1.3 Only the Program Manager will have the authority to activate and publish listings for visibility to the public.

5.1.4 Initial verification of a listing submission and its supporting documentation shall be performed within 10 business days of the submission.

5.1.4.1 Listing Owners will be notified within 15 business days of the listing submission of acceptance of the listing or the reason for denial of the application.

5.1.4.2 The Listing Owner may submit additional information after a denial to further support the system, or request a review through the appeal process, as referenced in Section 8.

5.2 Listing Publication

5.2.1 All listings will be published as part of a graphical user interface and Database as part of the Program. This Database will be accessible by end users and will allow such end users to search for and view performance of roofing systems, specifically for the purpose of verifying compliance with standards referenced as part of IBC Chapter 15.

5.3 Listing Revisions

5.3.1 The Listing Owner shall have secure access to its own listings and supporting documentation for maintenance and revision, as applicable.

5.3.2 Any revisions that affect a listing will remain unpublished until verified by the Program Manager.

5.3.3 During the Program Manager's review of the revision, the current listing will remain publicly accessible on the Database, unless withdrawn by the Listing Owner. This publicly visible listing will be updated once the revisions have been approved.

5.4 Listing Maintenance and Fees

5.4.1 Approximately sixty days before the annual fee due date, the Listing Owner will receive a notification and invoice with directions to pay the listing maintenance fee.

5.4.2 In addition to the annual fee requirement, to maintain a current listing, the Listing Owner must log into its secure account on a three-year cycle (except as noted in Section 5.4.2.1) and confirm that all supporting documentation, as well as the roofing system has not changed.

5.4.2.1 To maintain a listing generated from a FM Approvals RoofNav Assembly Number, the Listing Owner must log into its secure DORA database account annually and confirm that all supporting documentation, as well as the assembly has not changed.

5.4.3 All roofing system listings will remain on the public site if confirmation by the Listing Owner is completed and associated fees have been remitted.

5.4.4 Should the Listing Owner fail to complete the necessary confirmation or remit payment to maintain the assembly listing by the due date, the roofing system listing will revert to a status that will allow it provisionally to remain in the Database, but will not then be viewable to the public.

5.5 Listing Removal

5.5.1 The Listing Owner shall have the authority to terminate a listing at any time and without explanation.

5.5.2 It is the Listing Owner's responsibility to notify the Program Manager when a

supporting listing, as set forth in Section 4.2, is suspended or discontinued. Failure to maintain a supporting listing for a Program Listing will result in the removal of the listing from the Database.

5.6 Data Extensions

5.6.1 Data extensions or evaluations used in support of component changes to a listed system must be validated with documentation clearly identifying the Program Listing number(s), the revised or added component, the change made, rationale to support the change, and evidence of the performance equivalency.

6.0 Guideline Changes

6.1 Changes to Guidelines

6.1.1 SPRI shall maintain these Guidelines and supporting documentation that governs the Program.

6.1.2 If these Guidelines are revised, the Program Manager shall notify participants of the changes and, if needed, a path forward to update current listings.

6.1.3 When Guidelines are revised, the SPRI Listing Oversight Committee shall determine a reasonable phase-in period to accommodate compliance with any such revision.

7.0 Inspection of Recognized Plant Locations

7.1 Qualifying Quality Control Inspection

7.1.1 Following an application to enroll as an RCM for the Program, an initial qualifying inspection shall be announced and coordinated at the pending RCM's plant locations with an inspection agency, as described in Section 3.2.3.1. The initial inspection shall include a review and approval of the compliant quality system documentation and a review of the implementation of the documented quality system and associated processes and procedures at the manufacturing facility.

7.1.2 A qualifying inspection may be waived if the RCM's plant location can provide proof, through inspection reports and an agreement with an accredited inspection agency, that the components recognized in the Program are part of an ongoing quality assurance inspection program with at least one inspection per year.

7.2 Ongoing Quality Control Inspections

7.2.1 Inspections will be performed a minimum of once per year at each RCM's recognized plant location.

7.2.2 Each RCM will ensure that appropriate staff are available to assist the inspection agency representative during the inspections.

7.2.3 Proof of inspection may be through the submittal of inspection reports, inspection summary forms, or other equivalent documentation.

7.2.4 Documentation shall identify variances as a result of inspections and confirmation that variances have been resolved.

7.3 Noncompliance Issues and Variances

7.3.1 If the Program Manager is notified of non-compliance issue or issues in regard to the Guidelines, a variance may be issued by the Program Manager

to the contact of record for the affected RCM. The RCM shall be given the opportunity to provide a response for correcting the variance within a 30-day timeframe.

7.3.2 If a determination by the Program Manager of continued noncompliance issues or variances are believed to affect listed roofing systems, the Program Manager may request additional information at its discretion.

7.3.2.1 Any request for information by the Program Manager must be responded to by the RCM, or designated representative, within the timeframe specified by the Program Manager.

7.3.3 Failure to satisfactorily resolve variances may result in the removal of all affected listed systems from the publicly accessible Database.

8.0 Appeals of Listing Denials, Removals, and Challenges

8.1 Listing Actions Eligible for Appeals:

8.1.1 *Listing Denials*: Listing Owners' submissions of systems that are not approved for listing in the Database by the Program Manager.

8.1.2 *Listing Removals*: Listings that are removed from the Database by the Program Manager without the consent of the Listing Owner.

8.1.3 *Listing Challenges*: Disputes from a third party as to whether an existing published listing in the Database is legitimate.

8.2 Appeals

8.2.1 Listing Denials, Listing Removals, and decisions resulting from Listing Challenges may be appealed to the Dispute Resolution Committee ("DRC").

8.2.2 The Appellant may submit its appeal in writing to the DRC c/o SPRI's Managing Director, with a copy provided to the Program Manager. This appeal should include, as applicable, the listing number, listing record, and the reason(s) for the appeal supported with documentation and other evidence.

8.2.3 All such appeals must follow the requirements set forth in Section 8.2.2 above and the Appeal Process set forth in Section 8.3 below, and any further DRC requirements that may be published by SPRI and the DRC from time to time to facilitate the Program.

8.3 Appeal and Challenge Processes

8.3.1 In general, appeals shall be investigated fully and impartially by the DRC after which the DRC will issue its determination in writing to the Appellant filing the appeal with copies provided to all others concerned.

8.3.2 The DRC shall establish, and carry out regularly and non-discriminatorily, its own guidelines, procedures, and practices to review appeals, including as much as practical, a consensus-based decision-making process for granting or denying appeals, which process may be conducted in person or by remote conferencing.

8.3.3 While the DRC may request further information from the Appellant, the Program Manager, or others, the DRC intends normally and customarily to issue its determination, to be final, granting or denying the appeal, within thirty (30) days of the DRC's receipt of the appeal and all evidence provided in support.

8.3.4 Should the DRC grant the Appellant's Listing Denial or Listing Removal

appeal, the Program Manager, once notified in writing by the DRC, will activate the roofing system listing to the Database within three business days, assuming all other program requirements are met.

8.3.5 As to Challenges on existing listings, a surety deposit of $5,000 to fund the investigation is required from the challenger. If the listed roofing system being challenged is determined not to be legitimate, the surety deposit will be returned in full. If any further charge in excess of the surety deposit is required to complete the investigation, it is to be approved by the challenger prior to the completion of the investigation, and will be returned if the roofing system being challenged is ultimately found not to be legitimate. During the Listing Challenge process, the listing in question will remain viewable in the Database until resolution is reached.

SPRI
DORA™ Fire Classification
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
1:00 p.m.

AGENDA

I. Call to Order — C. Collins

II. Roll Call & Reading of SPRI Antitrust Statement

III. Reports & Updates
Review of October dicussion

IV. New Business
Discussion of options to recommend to the Steering Committee

V. Adjournment

Task Force Objective:
– Chadwick Collins, SPRI
start date 10/2023 *budget: $0*

The objective of this Task Force is to add determine how to best add fire classifications to the DORA® Listing program.

465 Waverley Oaks Road, Suite 421 – Waltham, MA 02452
t. 781.647.7026 f. 781.647-7222 e. info@spri.org

SPRI
DORA™ Listing Service
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
11:15 a.m.

AGENDA

I. Call to Order — C. Collins

II. Roll Call & Reading of SPRI Antitrust Statement

III. Reports & Updates
- a.) Steering Committee Updates
  - i. Education/Outreach (Collins and Wise)
  - ii. Scope Check
- b.) DORA Database Report & Updates (Wise)
- c.) Edge Securement Task Force Update (LeClare)
- d.) Fire Classification Task Force Update

IV. Unfinished Business
- a.) Contractor outreach
- b.) Maine update

V. New Business

VI. Adjournment

Task Force Objective:
– *Chadwick Collins, SPRI*

Develop 1-, 3- and 5-year objectives for the DORA platform in support of the SPRI Strategic Plan.

SPRI
Education Committee
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
11:30 a.m.

AGENDA

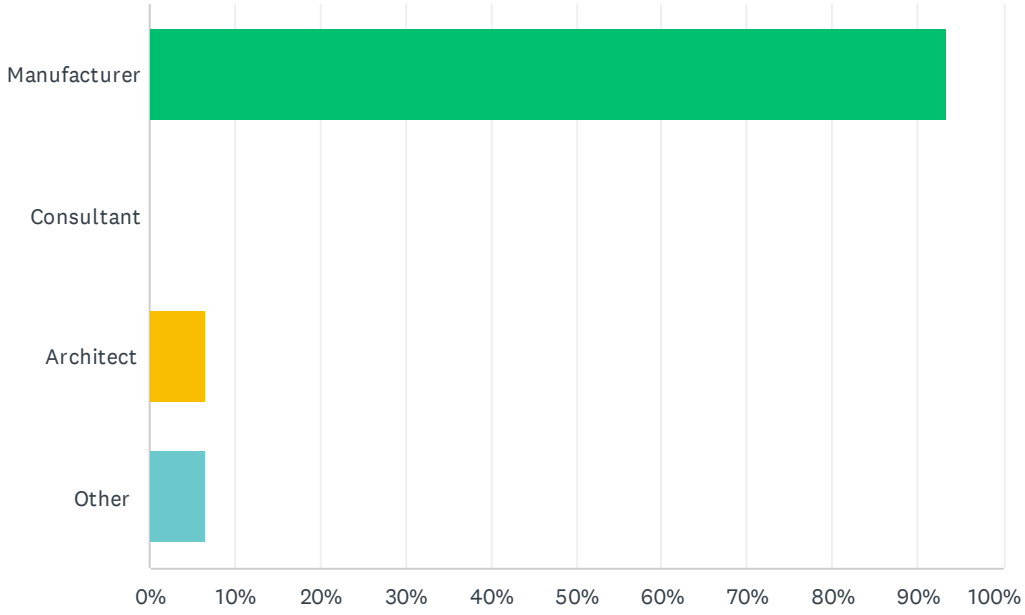
I.	Call to Order	B. Chamberlain
II.	Roll Call & Reading of SPRI Antitrust Statement	
III.	Review Survey Information about Wind Seminar Manufacturer's Position	
IV.	Ideas and thoughts	
V.	Adjournment	

465 Waverley Oaks Road, Suite 421 – Waltham, MA 02452
t. 781.647.7026 f. 781.647-7222 e. info@spri.org

Return to Schedule

Q1 Please indicate your role

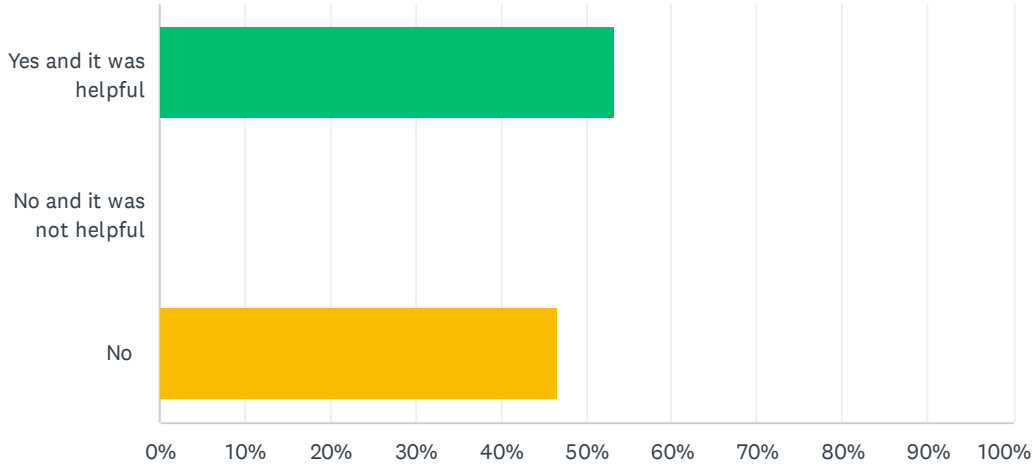
Answered: 15 Skipped: 0



ANSWER CHOICES	RESPONSES	
Manufacturer	93.33%	14
Consultant	0.00%	0
Architect	6.67%	1
Other	6.67%	1
Total Respondents: 15		

Q2 Did you watch the introductory video?

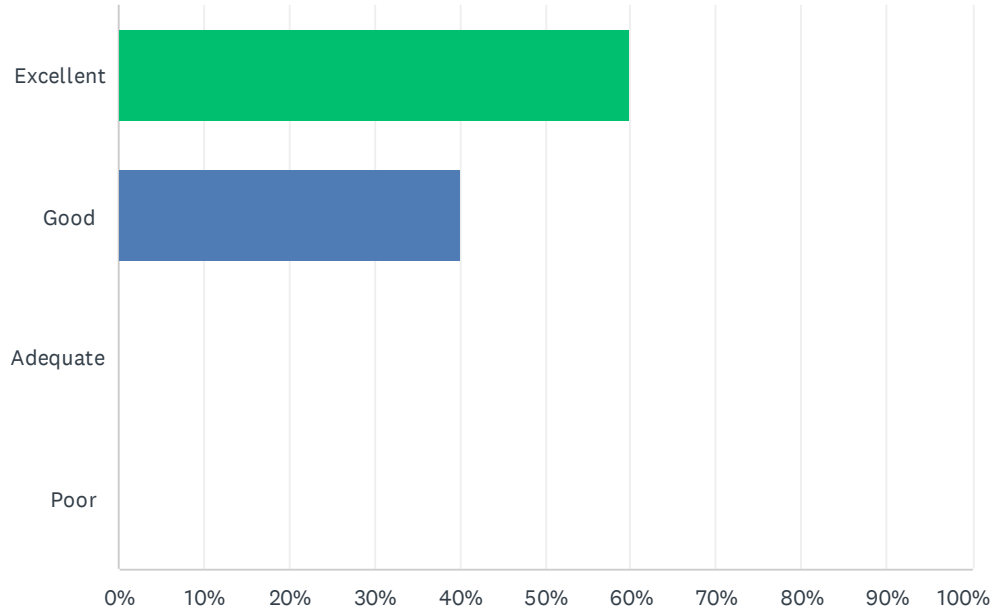
Answered: 15 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes and it was helpful	53.33%	8
No and it was not helpful	0.00%	0
No	46.67%	7
Total Respondents: 15		

Q3 Please rate the applicability/value of new knowledge, ideas, or information presented.

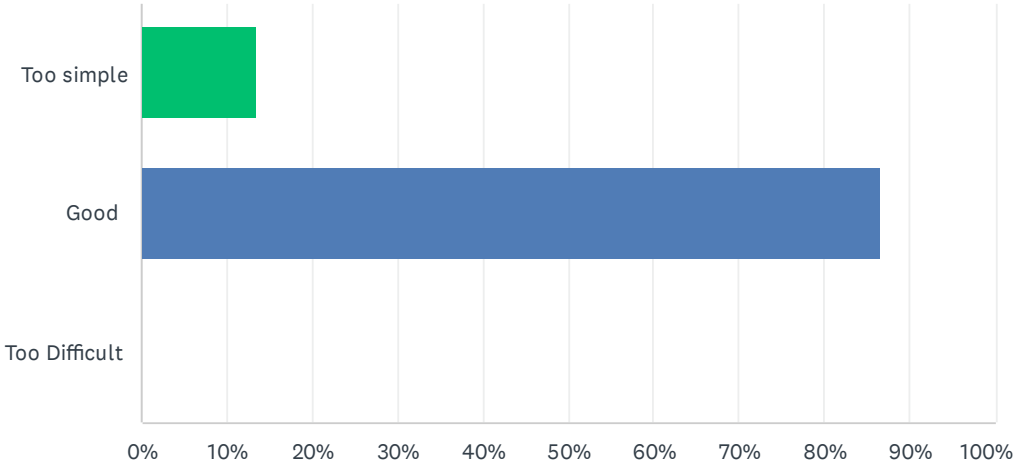
Answered: 15 Skipped: 0



ANSWER CHOICES	RESPONSES	
Excellent	60.00%	9
Good	40.00%	6
Adequate	0.00%	0
Poor	0.00%	0
TOTAL		15

Q4 How was the overall level of the material

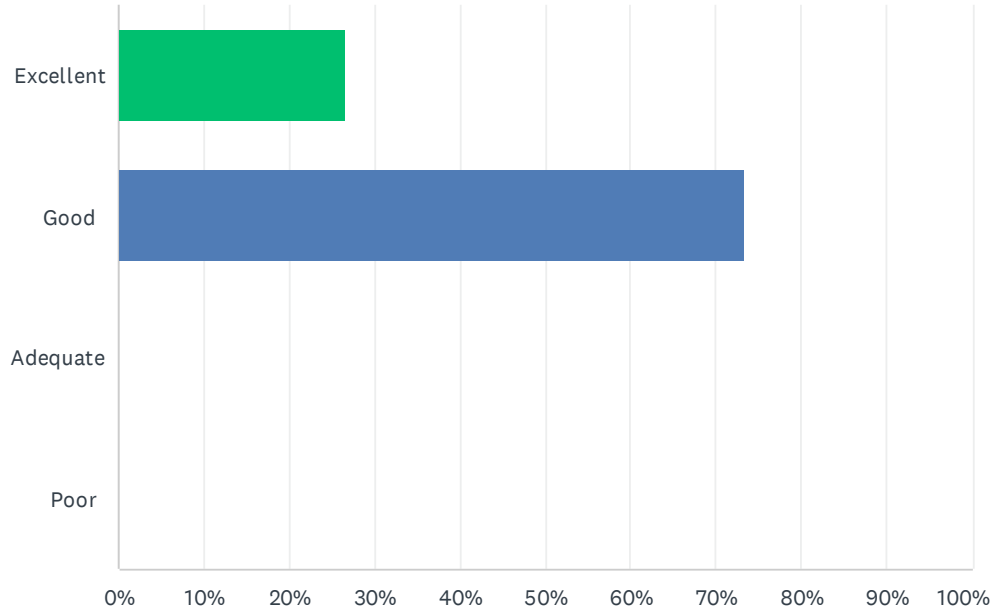
Answered: 15 Skipped: 0



ANSWER CHOICES	RESPONSES	
Too simple	13.33%	2
Good	86.67%	13
Too Difficult	0.00%	0
TOTAL		15

Q5 Please indicate the level in which your overall objectives for attending were met:

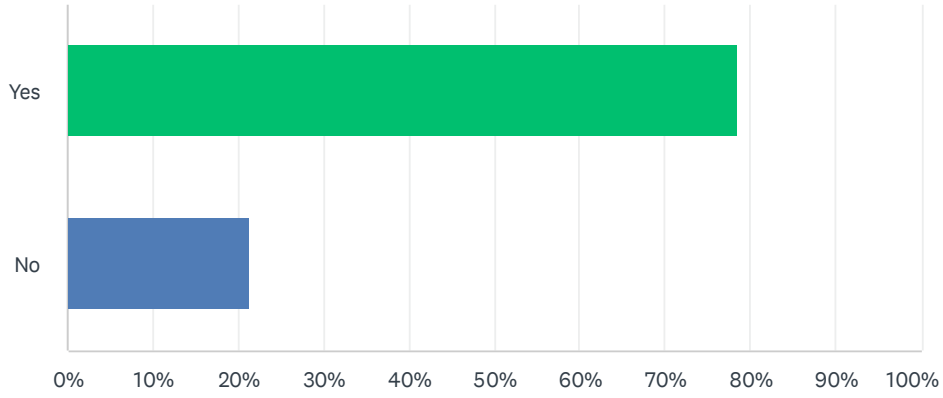
Answered: 15 Skipped: 0



ANSWER CHOICES	RESPONSES	
Excellent	26.67%	4
Good	73.33%	11
Adequate	0.00%	0
Poor	0.00%	0
TOTAL		15

Q6 Would you be interested in a more detailed, 6-hour in-person wind design seminar?

Answered: 14 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	78.57%	11
No	21.43%	3
TOTAL		14

Q7 We'd like to have your opinion on the overall presentation experience:

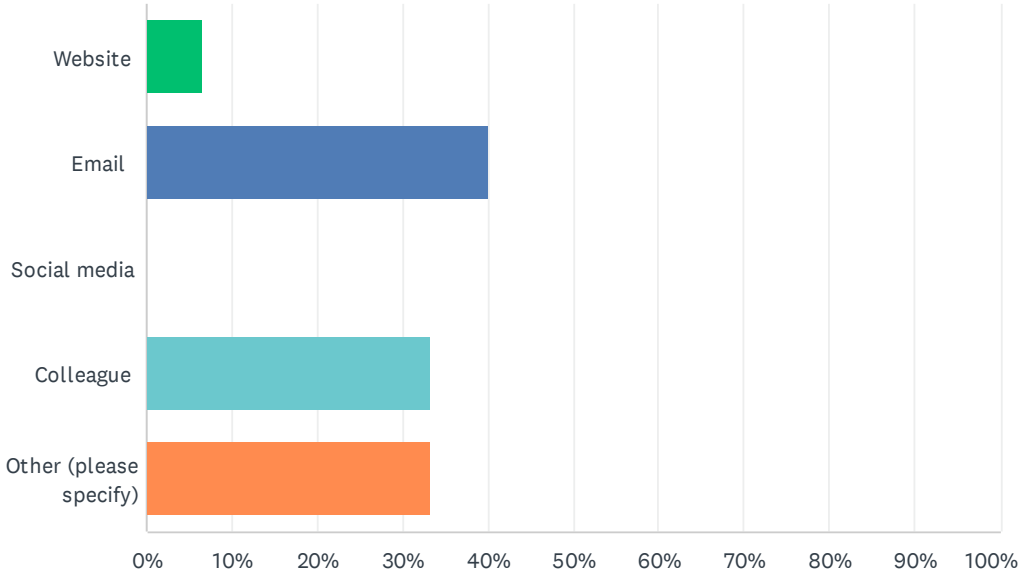
Answered: 15 Skipped: 0

Q8 Do you have any ideas on how the session could be improved?

Answered: 15 Skipped: 0

Q9 How did you hear about this program?

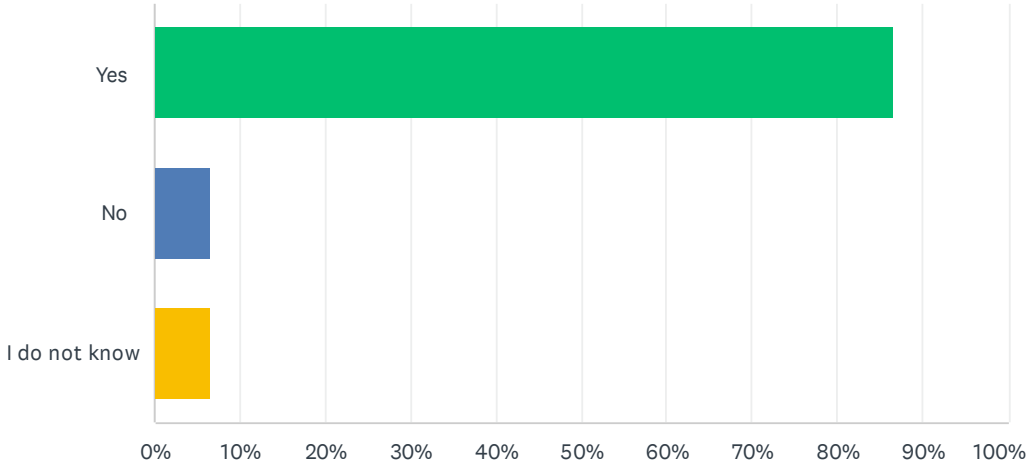
Answered: 15 Skipped: 0



ANSWER CHOICES	RESPONSES	
Website	6.67%	1
Email	40.00%	6
Social media	0.00%	0
Colleague	33.33%	5
Other (please specify)	33.33%	5
Total Respondents: 15		

Q10 Is your company a SPRI member?

Answered: 15 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	86.67%	13
No	6.67%	1
I do not know	6.67%	1
Total Respondents: 15		

SPRI
PRO Guide
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
2:30 p.m.

AGENDA

I. Call to Order — C. Collins

II. Roll Call & Reading of SPRI Antitrust Statement

III. Reports & Updates
Review Tracking Document and Updates

IV. Unfinished Business
a.) Technical Director Review & Proposed Actions
b.) Thermoplastic Document Update
c.) Document Traffic Data Review

V. New Business

VI. Adjournment

Task Force Objective:
– Chadwick Collins, SPRI
start date 07/2023 *objective approved 07/2023* *budget: $0*

This Task Force will review, and update as needed the reference documents on the SPRI website. A sub-task force will review the thermoplastic detail documents and determine if they should be updated.

SPRI
PVC Environmental
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
2:30 p.m.

AGENDA

I.	Call to Order	S. Stanley
II.	Roll Call & Reading of SPRI Antitrust Statement	
III.	Review edits from interim meeting	
IV.	Finalize the White Paper on the sustainability of PVC roofing membranes	
V.	Adjournment	

Task Force Objective:
– Shawn Stanley, IB Roof Systems
start date 07/2022 objectives approved 10/19/2022 budget: $20,000

The approved objectives of this Task Force are:

- To collaborate with interested industry parties to remove flexible PVC roofing membranes from the Red List.
- Educate Living Building Challenge and LEED to acknowledge and differentiate flexible PVC roofing materials from other PVC uses types and categories.
- Explore alternate offsets or trade-offs to resolve Red List exceptions.
- Combat possible regulations on a national level that are biased against flexible PVC roofing membranes.

1. Overview.

Engineering Plastic has allowed significant technological advances and quality of life, from transportation to lifesaving devices. While there are many types, this white paper will address the benefits, criticisms, and regulations regarding a particular use of polyvinyl chloride (PVC), particularly in roofing applications. PVC roofing membranes are better known as thermoplastics. Focusing on thermoplastic membranes will show a need to look at each class of plastics differently, separating thermoplastic roofing membranes from others and concentrating on its sustainable and environmental properties.

Before we delve into this, let's break down plastics into three categories.

Single-Use Plastics: Single-use plastics are defined as plastics that are typically used once or briefly before disposal. Once that purpose has been fulfilled, there is no longer a useful purpose for this plastic. This plastic often does not carry a recycle resin ID number (1-7). This type of plastic is not considered recyclable in all states. Typical uses include packaging and wrapping.

Reusable Plastics: Reusable plastics are a resilient, robust type of plastic that can be repurposed or recycled multiple times through heat transformation. Multi-use plastics can be produced from recycled plastics and incorporate a long working life, after which they can be recycled, and the material can be reused to produce another product. This plastic either has a known recycle ID number 1-7 or has a known downstream industry use when recycled.

Durable Plastics: Durable plastics are a durable, long-lasting category of plastic intended to have a service life of 20 years or more. They can be mechanically or chemically recycled as feedstock material for downstream repurposed use at the end of their initial life. Due to its potential for recycling, it remains in continuous use in a second or third phase.

Warning - - This document is draft material and work-in-progress.
Significant changes may occur as a result of final quality checking

Thermoplastic roofing membranes are a durable form of PVC and are often invisible in daily life. Thermoplastic roofing membranes have performed the essential function of keeping conditioned spaces dry for decades. Specific assemblies have been designed to last 50 years.

Thermoplastic membranes and Polyvinyl Chloride are constructed from simple monomers made from oil and salt.[1] It was discovered twice, first in 1832 by French chemist Henri Victor Regnault and then rediscovered in 1872 by a German man named Eugene Baumann.[2] It was one of the first plastics to be commercially produced, starting in 1933. [3] Most other commercial polymers did not come into commercial production until the 1940s.

Today, thermoplastic roofing membranes are manufactured to internationally recognized environmental standards and have undergone extensive testing. These have been certified as safe by many international codifying bodies. Even the flexible agent used in thermoplastic roofing membranes has received a safe issuance letter from California. (footnote needed here) Modern thermoplastic roofing membranes are among the most efficient solutions for roofing applications.

Criticism and concerns about thermoplastic roofing membranes are often not informed by modern advances in the roofing industry. Healthy Building Network, Living Building Challenge, and Beyond Plastics are among environmental groups criticizing the manufacturing and use of all PVC, lumping all the categories together, including thermoplastic membranes. The data most critics refer to is often not current with present manufacturing practices. For example, claims are made that all modern PVC utilizes lead and cadmium in its production. This is incorrect. When founded on false premises, such as these, the conclusions of the criticisms are also erroneous. Because of claims regarding PVC in general, thermoplastic roofing membranes are in danger of getting lumped into other regulations and penalties and potentially threatened to be removed from the marketplace by bans on plastic or the evolving extended producer responsibility (EPR) regulations. After addressing these criticisms, it will be easy to conclude that thermoplastic

[1]https://www.bpf.co.uk/plastipedia/polymers/PVC.aspx
[2] https://www.creativemechanisms.com/blog/everything-you-need-to-know-about-pvc-plastic.
[3] https://www.bpf.co.uk/plastipedia/polymers/PVC.aspx

roofing membranes are safe and essential in the environmentally sustainable construction world, which should remain an option in the marketplace.

With non-governmental bodies increasingly scrutinizing the accumulation of post-consumer plastic, consideration should be given to the product's service life, durability, and sustainability. Single-use plastics should be examined differently than durable plastics such as thermoplastic roofing membranes.

A quick explanation of how plastics are produced will help the reader understand more of our premise. Plastics have remarkable properties, including hardness, toughness, elasticity, strength, adhesion, and durability. Plastics create these properties through the interactions of long chains of repeating units called monomers, the fundamental building blocks of plastics. These monomers link together end to end through a process called polymerization, forming a polymer. The interactions between and dynamics of these polymers create a vast array of observed plastic properties. In addition to the interactions of these chains, This unique adaptability allows plastics to serve many purposes, from lightweight packaging materials to robust structural components, making them indispensable in our modern world.

In contrast, most non-plastic alternative materials, such as steel, glass, and aluminum, are formed by significant quantities of petroleum-based or electrical energy during manufacturing and recycling. Plastic manufacturing relies on catalysts that, in small quantities, lower the energy required to string together the monomers into a polymer, thus reducing the amount of embodied carbon in the plastic.

In addition to the ease of creation, polymerization transforms the material. For example, as a monomer, vinyl chloride is a toxic material, [4] yet when it is polymerized into polyvinyl chloride (PVC), it is certified as safe for drinking water or the material of choice for lifesaving medical devices, pharmaceuticals, and thermoplastic membrane roofing applications.[5] Simple building blocks or monomers such as ethylene, propylene, vinyl chloride, and styrene create most polymers, with polyvinyl chloride being one of the only plastics that is not heavily petroleum-

[4] Vinyl Chloride Toxicity - StatPearls - NCBI Bookshelf (nih.gov)
[5] PVC Remains Material of Choice for Life-Saving Medical Devices (plasticstoday.com)

based. Small quantities of additives add a vast range of specific properties to the final mixture. Examples of these properties can include flexibility, UV stabilizers, fire resistance, and pigments.

Warning - - This document is draft material and work-in-progress.
Significant changes may occur as a result of final quality checking

2. Plastic Sustainability is Important as Consumption Increases

In our contemporary world, plastics offer cost-effective and environmentally efficient solutions across many applications that define modern life. However, the visible accumulation of post-consumer single-use plastic waste, persisting long after its intended use, has sparked concerns and prompted discussions about whether plastics are indeed the most sustainable choice. The calls for regulation[6][7] or outright bans[8] from environmental groups such as the Healthy Building Network, Beyond Plastics, and Living Building Challenge have grown louder. These arguments stem from looking at PVC as individual components rather than the completed product, such as thermoplastic roofing membranes. The belief is that all PVC encompasses hazardous chemicals, phthalates, and others as separate components, but once produced correctly, these arguments do not apply to most construction-grade PVC and thermoplastic roofing membranes. Responsible methods to handle recycling or end-of-life disposal become essential to comprehending the thermoplastic membrane life cycle, sustainability, and durability in the environmental frontier. This approach will serve everyone better than a holistic ban on anything PVC. Finding common ground with well-intentioned environmental groups is crucial in separating the good utilization of PVC from poor uses. Fast-growing environmental construction practices need durable and sustainable products such as thermoplastic roofing membranes in their pursuit of sustainability.

[6] Single Use plastics: A road to Sustainability, United Nations Environmental Program, 2018, ISBN: 978-92-807-3705-9
[7] U.S. Actions to Address Plastic Pollution - United States Department of State
[8] Plastic Bans and Recycling Mandates Gain Steam in US and Abroad (businessinsider.com)

3. Reduce, Reuse and Recycle: Extended Producer Responsibility (EPR) and The Impact on PVC Materials

In response to post-use plastic waste, the three strategies to manage this issue include reducing, reusing, and recycling.

One reduction strategy includes implementing taxes, production quotas, and bans on single-use plastic, but has had limited success. Implementing reduce and reuse strategies occurs ad hoc, making it difficult to quantify their actual impact. Often, the efforts to reduce have come from regulation. Bans on single-use plastic cutlery, straws, and food containers have been implemented with mixed results.[10]. This approach to reducing plastic using bans or quotas may adversely affect the production and use of thermoplastic roofing membranes, removing a sustainable choice in environmental construction projects.

some alternatives to thermoplastic roofing membranes have higher GHG emissions and are less efficient or effective.

(6a) In July of 2022, Mkinsey & Company published an extensive study on the climate impact of plastics. It also showed that the move toward decarbonization in 2050 would be hard to achieve without PVC and other plastics. It examined the total GHG contribution of plastics versus its alternatives, including product life cycle (cradle to grave) and impact of use.

Its findings were that in 13 out of 14 cases, PVC and other plastics had lower total greenhouse gas contribution than their likely alternatives. The whole of the report can be read by referencing the footnotes below.(footnote needed here)

Another way legislative bodies are trying to encourage recycling is by adopting extended producer responsibility laws.[12] Currently, the regulations are focused on promoting plastic packaging recycling by imposing a graduated fee structure that rewards manufacturers that include additional post-consumer waste in new products. It is conceivable that future regulation

[10] The Case against paper straws, Annie Lawrey, The Atlantic
[12] Extended Producer Responsibility - SPC's Guide (sustainablepackaging.org)

may expand beyond plastic packaging and affect long-duration materials such as thermoplastic roofing. For instance, the California EPR plan states: "EPR gives primary responsibility for managing products after their useful life to producers, who can design and market products to be more easily recycled."[14] This approach may be practical for materials designed for limited service life but not for long-term construction-grade PVC products or thermoplastic roofing membranes.

Recycling is a developing component of the lifecycle management of the thermoplastic roofing industry. Europe has established several efforts to foster recycling, such as Recovinyl[15] and Vinyl Plus.[16] These efforts are showing remarkable progress, with nearly 1M tons recycled. Further studies have shown that PVC can be recycled up to 8 times depending on the application.[17] In the US, similar efforts are taking place and are growing. In 2022 the CFFA – Vinyl Roofing Division recorded 19.2 million pounds of pre-consumer thermoplastic roofing membrane and 1 million pounds of post-consumer membrane recycled. https://vinylroofs.org/wp-content/uploads/2023/03/RecyclingWhitePaper.pdf The industry has also significantly advanced in developing economically efficient feedstock recycling of post-consumer thermoplastic membranes.[18]

As these EPR regulations become more refined and have wider adoption, recognizing the diversity of plastic applications is essential. Regulations should adapt to the specifics of the application. Applications like thermoplastic roofing membranes, requiring decades of performance, should be looked at differently than short-lived single-use plastic. It will be imperative that EPR laws recognize these categories and differentiate the products and applications based on the category of use. For example, if fees are developed, the fees charged for single-use plastics to encourage recycling should be significantly different than those for materials designed to last decades.

[14] SB 54: Plastic Pollution Prevention and Packaging Producer Responsibility Act - CalRecycle Home Page
[15] Home | Recovinyl
[16] PVC Remains Material of Choice for Life-Saving Medical Devices (plasticstoday.com)
[17] Sustainable and Recyclable - VinylPlus
[18] Lewandowski K, Skórczewska K. A Brief Review of Poly(Vinyl Chloride) (PVC) Recycling. Polymers (Basel). 2022 Jul 27;14(15):3035. doi: 10.3390/polym14153035. PMID: 35893999; PMCID: PMC9332854.

4. Applications of Polyvinyl Chloride (PVC) Based Materials

In its rigid form, PVC exhibits impressive strength, making it an ideal choice for applications piping, conduit, siding, window, and door profiles. However, when a plasticizer is added, it transforms into a remarkably flexible material. This dual nature encompasses the gamut from robust rigidity to supple flexibility, underpinning its widespread usage across various industries and applications. For example, PVC is critical to medical applications, accounting for 25% of all medical plastics.[23] 70% of the production volume is in long-duration building and construction applications such as thermoplastic roofing membranes, pipes, cables, siding, flooring, fencing, and decking.[24] Alternatives to these construction applications would not be as sustainable, environmentally friendly, or adaptable. Because of this, roof consultants and architects often choose thermoplastic membranes when given the choice of roofing materials.

Additionally, the native durability of thermoplastic membranes allows it be printed or colored white, creating a "cool roof" reflecting solar energy, thereby decreasing the energy required to maintain condition spaces. Thermoplastic roofing membranes' innate durability and toughness enable various modern building design applications, including solar installations, green roofs, or entertaining rooftop spaces.

[23] PVC Remains Material of Choice for Life-Saving Medical Devices (plasticstoday.com)
[24] https://www.plasticsnews.com/news/vinyl-institute-recycled-pvc-has-role-infrastructure-projects?

5. Current Environmental Guidance and Concerns About the Formulation of PVC Materials

Throughout its century-long existence, few polymers have faced the level of scrutiny and controversy that polyvinyl chloride (PVC) has endured. This versatile material has been the subject of intense examination by authorities and has faced criticism from numerous non-governmental organizations (NGOs). Some of the most significant concerns have centered on the use of lead and cadmium as stabilizers, the presence of chlorine in PVC, the incorporation of phthalates, and the potential generation of dioxins during its production processes.

Thankfully, the utilization of lead and cadmium as PVC stabilizers has become obsolete, with cadmium being phased out in the US and Canada since 2000,[25] followed by Europe in 2001.[26] Likewise, lead was phased out in the US in 2006[27] and Europe in 2007, [28] marking significant steps toward safer and more sustainable PVC production.

Thermoplastic membranes incorporate additives and plasticizers to protect from UV degradation and keep the membrane flexible. One criticism is that these additives permeate from the membrane and become troublesome in the environment. Fortunately, this is not a concern. Heavy molecular weighted plasticizers ensure thermal stability and flexibility without fear of these additives separating from the membrane. This was shown in the 2013 study by the State of Washington, where water run-off was collected from various roofing materials to see what chemicals leached out. Thermoplastic roofing membrane had zero amounts of plasticizers or phthalates present for all rain events. And as mentioned previously, California has granted this additive, safe issuance.

[25] A Turner, M Filella, Polyvinyl chloride in consumer and environmental plastics, with a particular focus on metal-based additives, Environ. Sci.: Processes Impacts, 2021, 23, 1376-1384, DOI: 10.1039/D1EM00213A
[26] VinylPlus_Contribution-Cefic_Eu-Industry.pdf (stabilisers.eu)
[27] A Turner, M Filella, Polyvinyl chloride in consumer and environmental plastics, with a particular focus on metal-based additives, Environ. Sci.: Processes Impacts, 2021, 23, 1376-1384, DOI: 10.1039/D1EM00213A
[28] VinylPlus_Contribution-Cefic_Eu-Industry.pdf (stabilisers.eu)

PVC and thermoplastic membranes owe much of their unique properties to the presence of chlorine in its monomer structure. This chlorine content alters the polymer's density and imparts several valuable characteristics, including enhanced chemical stability, flame retardancy, durability, and resistance to high temperatures[34]. It is important to distinguish between elemental chlorine, which can indeed be hazardous, and the chlorine chemically bound within PVC itself. While elemental chlorine gas can be problematic, [35] it's essential to recognize that chlorine is a naturally occurring element, ranking as our planet's second most abundant halogen. Moreover, chlorine serves as one of the six essential macronutrients vital for providing ions required for various cellular functions[36] and is primarily found in common table salt,[37] highlighting its ubiquity and significance in the natural world.

The potential for dioxin production has been a source of concern in relation to thermoplastic membranes, [43] but it's important to note that this concern primarily arises when it is improperly disposed of through burning.[44] Thermoplastic roofing membranes' manufacturing and intended use are not the main culprits. Regulations governing the disposal of PVC and thermoplastic membranes have played a crucial role in mitigating the release of dioxins into the environment. Solutions (increased recycling) and regulations have addressed these potential issues. [45,46]

Due to their long lifespan, thermoplastic roofing membranes are a great foundation for solar arrays and vegetative roofs. The life span and highly reflective colors of thermoplastic roofing membranes aid in preventing the urban heat island effect, saving energy, especially in hot summer months where peak demand is a problem, as shown by the Cool Roof Rating Council

[34] Ayodeji Emmanuel Amobonye, Prashant Bhagwat, Suren Singh, Santhosh Pillai, Chapter 10 - Biodegradability of Polyvinyl chloride, Pages 201-220, Editor(s): Anjana Sarkar, Bhasha Sharma, Shashank Shekhar, in Biodegradability of Conventional Plastics, Elsevier, 2023, , ISBN 9780323898584, https://doi.org/10.1016/B978-0-323-89858-4.00017-8.
[35] https://www.greenpeace.org/usa/wp-content/uploads/legacy/Global/usa/report/2009/4/pvc-the-poison-plastic.html
[36]https://chem.libretexts.org/Bookshelves/General_Chemistry/Book%3A_General_Chemistry%3A_Principles_Patterns_and_Applications_(Averill)/01%3A_Introduction_to_Chemistry/1.09%3A_Essential_Elements_for_Life
[37] https://chemistry-guide.com/10-reasons-why-chlorine-is-important/
[43] https://www.greenpeace.org/usa/wp-content/uploads/legacy/Global/usa/report/2009/4/pvc-the-poison-plastic.html
[44] Zhang M, Buekens A, Jiang X, Li X. Dioxins and polyvinylchloride in combustion and fires. Waste Manag Res. 2015 Jul;33(7):630-43. doi: 10.1177/0734242X15590651. PMID: 26185164.
[45] PVC incineration and dioxins - ECVM
[46] Zhang M, Buekens A, Jiang X, Li X. Dioxins and polyvinylchloride in combustion and fires. Waste Manag Res. 2015 Jul;33(7):630-43. doi:

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As regulations evolve, Legislation should classify thermoplastic roofing as a durable material and preserve it as an option for waterproofing applications without penalties or regulations regarding its use or recycling.

Plastic waste from short-term usage is of concern, and where other innovations can help, but thermoplastic roofing membranes are an effective sustainable, low-carbon choice. Concerns about the health and safety of thermoplastic roofing membranes and other construction-grade PVC products are related to individual components in isolation from the products or from historical processes that are no longer part of production. Flexible thermoplastic roofing membranes are also used as geomembranes to line and cap landfills and continue their low carbon footprint.[50]

Construction-grade PVC materials and thermoplastic roofing membranes (70%) are generally used in durable building and construction applications where decades of service are expected. The service lifetime of materials used in these applications should be considered in the evolving EPR regulations. These products are low carbon, certified, and safe[52] for waterproofing and construction applications.

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[50] Chemical Fabrics & Film Association (CFFA) Environmental Product Declaration (EPD)
[52] Issuance of a Safe Use Determination for Diisononyl Phthalate in Certain Single-Ply Polyvinyl Chloride Roofing Membrane Products - OEHHA (ca.gov)

1. Overview.

Engineering Plastic has allowed significant technological advances and quality of life, from transportation to lifesaving devices. While there are many types, this white paper will address the benefits, criticisms, and regulations regarding a particular use of polyvinyl chloride (PVC), particularly in roofing applications. PVC roofing membranes are better known as thermoplastics. Focusing on thermoplastic membranes will show a need to look at each class of plastics differently, separating thermoplastic roofing membranes from others and concentrating on its sustainable and environmental properties.

Before we delve into this, let's break down plastics into three categories.

Single-Use Plastics: Single-use plastics are defined as plastics that are typically used once or briefly before disposal. Once that purpose has been fulfilled, there is no longer a useful purpose for this plastic. This plastic often does not carry a recycle resin ID number (1-7). This type of plastic is not considered recyclable in all states. Typical uses include packaging and wrapping.

Reusable Plastics: Reusable plastics are a resilient, robust type of plastic that can be repurposed or recycled multiple times through heat transformation. Multi-use plastics can be produced from recycled plastics and incorporate a long working life, after which they can be recycled, and the material can be reused to produce another product. This plastic either has a known recycle ID number 1-7 or has a known downstream industry use when recycled.

Durable Plastics: Durable plastics are a durable, long-lasting category of plastic intended to have a service life of 20 years or more. They can be mechanically or chemically recycled as feedstock material for downstream repurposed use at the end of their initial life. Due to its potential for recycling, it remains in continuous use in a second or third phase.

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Thermoplastic roofing membranes are a durable form of PVC and are often invisible in daily life. Thermoplastic roofing membranes have performed the essential function of keeping conditioned spaces dry for decades. Specific assemblies have been designed to last 50 years.

Thermoplastic membranes and Polyvinyl Chloride are constructed from simple monomers made from oil and salt.[1] It was discovered twice, first in 1832 by French chemist Henri Victor Regnault and then rediscovered in 1872 by a German man named Eugene Baumann.[2] It was one of the first plastics to be commercially produced, starting in 1933. [3] Most other commercial polymers did not come into commercial production until the 1940s.

Today, thermoplastic roofing membranes are manufactured to internationally recognized environmental standards and have undergone extensive testing. These have been certified as safe by many international codifying bodies. Even the flexible agent used in thermoplastic roofing membranes has received a safe issuance letter from California. (footnote needed here) Modern thermoplastic roofing membranes are among the most efficient solutions for roofing applications.

Criticism and concerns about thermoplastic roofing membranes are often not informed by modern advances in the roofing industry. Healthy Building Network, Living Building Challenge, and Beyond Plastics are among environmental groups criticizing the manufacturing and use of all PVC, lumping all the categories together, including thermoplastic membranes. The data most critics refer to is often not current with present manufacturing practices. For example, claims are made that all modern PVC utilizes lead and cadmium in its production. This is incorrect. When founded on false premises, such as these, the conclusions of the criticisms are also erroneous. Because of claims regarding PVC in general, thermoplastic roofing membranes are in danger of getting lumped into other regulations and penalties and potentially threatened to be removed from the marketplace by bans on plastic or the evolving extended producer responsibility (EPR) regulations. After addressing these criticisms, it will be easy to conclude that thermoplastic

[1]https://www.bpf.co.uk/plastipedia/polymers/PVC.aspx
[2] https://www.creativemechanisms.com/blog/everything-you-need-to-know-about-pvc-plastic.
[3] https://www.bpf.co.uk/plastipedia/polymers/PVC.aspx

roofing membranes are safe and essential in the environmentally sustainable construction world, which should remain an option in the marketplace.

With non-governmental bodies increasingly scrutinizing the accumulation of post-consumer plastic, consideration should be given to the product's service life, durability, and sustainability. Single-use plastics should be examined differently than durable plastics such as thermoplastic roofing membranes.

A quick explanation of how plastics are produced will help the reader understand more of our premise. Plastics have remarkable properties, including hardness, toughness, elasticity, strength, adhesion, and durability. Plastics create these properties through the interactions of long chains of repeating units called monomers, the fundamental building blocks of plastics. These monomers link together end to end through a process called polymerization, forming a polymer. The interactions between and dynamics of these polymers create a vast array of observed plastic properties. In addition to the interactions of these chains, This unique adaptability allows plastics to serve many purposes, from lightweight packaging materials to robust structural components, making them indispensable in our modern world.

In contrast, most non-plastic alternative materials, such as steel, glass, and aluminum, are formed by significant quantities of petroleum-based or electrical energy during manufacturing and recycling. Plastic manufacturing relies on catalysts that, in small quantities, lower the energy required to string together the monomers into a polymer, thus reducing the amount of embodied carbon in the plastic.

In addition to the ease of creation, polymerization transforms the material. For example, as a monomer, vinyl chloride is a toxic material, [4] yet when it is polymerized into polyvinyl chloride (PVC), it is certified as safe for drinking water or the material of choice for lifesaving medical devices, pharmaceuticals, and thermoplastic membrane roofing applications.[5] Simple building blocks or monomers such as ethylene, propylene, vinyl chloride, and styrene create most polymers, with polyvinyl chloride being one of the only plastics that is not heavily petroleum-

[4] Vinyl Chloride Toxicity - StatPearls - NCBI Bookshelf (nih.gov)
[5] PVC Remains Material of Choice for Life-Saving Medical Devices (plasticstoday.com)

based. Small quantities of additives add a vast range of specific properties to the final mixture. Examples of these properties can include flexibility, UV stabilizers, fire resistance, and pigments.

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2. Plastic Sustainability is Important as Consumption Increases

In our contemporary world, plastics offer cost-effective and environmentally efficient solutions across many applications that define modern life. However, the visible accumulation of post-consumer single-use plastic waste, persisting long after its intended use, has sparked concerns and prompted discussions about whether plastics are indeed the most sustainable choice. The calls for regulation[6][7] or outright bans[8] from environmental groups such as the Healthy Building Network, Beyond Plastics, and Living Building Challenge have grown louder. These arguments stem from looking at PVC as individual components rather than the completed product, such as thermoplastic roofing membranes. The belief is that all PVC encompasses hazardous chemicals, phthalates, and others as separate components, but once produced correctly, these arguments do not apply to most construction-grade PVC and thermoplastic roofing membranes. Responsible methods to handle recycling or end-of-life disposal become essential to comprehending the thermoplastic membrane life cycle, sustainability, and durability in the environmental frontier. This approach will serve everyone better than a holistic ban on anything PVC. Finding common ground with well-intentioned environmental groups is crucial in separating the good utilization of PVC from poor uses. Fast-growing environmental construction practices need durable and sustainable products such as thermoplastic roofing membranes in their pursuit of sustainability.

[6] Single Use plastics: A road to Sustainability, United Nations Environmental Program, 2018, ISBN: 978-92-807-3705-9
[7] U.S. Actions to Address Plastic Pollution - United States Department of State
[8] Plastic Bans and Recycling Mandates Gain Steam in US and Abroad (businessinsider.com)

3. Reduce, Reuse and Recycle: Extended Producer Responsibility (EPR) and The Impact on PVC Materials

In response to post-use plastic waste, the three strategies to manage this issue include reducing, reusing, and recycling.

One reduction strategy includes implementing taxes, production quotas, and bans on single-use plastic, but has had limited success. Implementing reduce and reuse strategies occurs ad hoc, making it difficult to quantify their actual impact. Often, the efforts to reduce have come from regulation. Bans on single-use plastic cutlery, straws, and food containers have been implemented with mixed results.[10]. This approach to reducing plastic using bans or quotas may adversely affect the production and use of thermoplastic roofing membranes, removing a sustainable choice in environmental construction projects.

some alternatives to thermoplastic roofing membranes have higher GHG emissions and are less efficient or effective.

(6a) In July of 2022, Mkinsey & Company published an extensive study on the climate impact of plastics. It also showed that the move toward decarbonization in 2050 would be hard to achieve without PVC and other plastics. It examined the total GHG contribution of plastics versus its alternatives, including product life cycle (cradle to grave) and impact of use.

Its findings were that in 13 out of 14 cases, PVC and other plastics had lower total greenhouse gas contribution than their likely alternatives. The whole of the report can be read by referencing the footnotes below.(footnote needed here)

Another way legislative bodies are trying to encourage recycling is by adopting extended producer responsibility laws.[12] Currently, the regulations are focused on promoting plastic packaging recycling by imposing a graduated fee structure that rewards manufacturers that include additional post-consumer waste in new products. It is conceivable that future regulation

[10] The Case against paper straws, Annie Lawrey, The Atlantic
[12] Extended Producer Responsibility - SPC's Guide (sustainablepackaging.org)

may expand beyond plastic packaging and affect long-duration materials such as thermoplastic roofing. For instance, the California EPR plan states: "EPR gives primary responsibility for managing products after their useful life to producers, who can design and market products to be more easily recycled."[14] This approach may be practical for materials designed for limited service life but not for long-term construction-grade PVC products or thermoplastic roofing membranes.

Recycling is a developing component of the lifecycle management of the thermoplastic roofing industry. Europe has established several efforts to foster recycling, such as Recovinyl[15] and Vinyl Plus.[16] These efforts are showing remarkable progress, with nearly 1M tons recycled. Further studies have shown that PVC can be recycled up to 8 times depending on the application.[17] In the US, similar efforts are taking place and are growing. In 2022 the CFFA – Vinyl Roofing Division recorded 19.2 million pounds of pre-consumer thermoplastic roofing membrane and 1 million pounds of post-consumer membrane recycled. https://vinylroofs.org/wp-content/uploads/2023/03/RecyclingWhitePaper.pdf The industry has also significantly advanced in developing economically efficient feedstock recycling of post-consumer thermoplastic membranes.[18]

As these EPR regulations become more refined and have wider adoption, recognizing the diversity of plastic applications is essential. Regulations should adapt to the specifics of the application. Applications like thermoplastic roofing membranes, requiring decades of performance, should be looked at differently than short-lived single-use plastic. It will be imperative that EPR laws recognize these categories and differentiate the products and applications based on the category of use. For example, if fees are developed, the fees charged for single-use plastics to encourage recycling should be significantly different than those for materials designed to last decades.

[14] SB 54: Plastic Pollution Prevention and Packaging Producer Responsibility Act - CalRecycle Home Page
[15] Home | Recovinyl
[16] PVC Remains Material of Choice for Life-Saving Medical Devices (plasticstoday.com)
[17] Sustainable and Recyclable - VinylPlus
[18] Lewandowski K, Skórczewska K. A Brief Review of Poly(Vinyl Chloride) (PVC) Recycling. Polymers (Basel). 2022 Jul 27;14(15):3035. doi: 10.3390/polym14153035. PMID: 35893999; PMCID: PMC9332854.

4. Applications of Polyvinyl Chloride (PVC) Based Materials

In its rigid form, PVC exhibits impressive strength, making it an ideal choice for applications piping, conduit, siding, window, and door profiles. However, when a plasticizer is added, it transforms into a remarkably flexible material. This dual nature encompasses the gamut from robust rigidity to supple flexibility, underpinning its widespread usage across various industries and applications. For example, PVC is critical to medical applications, accounting for 25% of all medical plastics.[23] 70% of the production volume is in long-duration building and construction applications such as thermoplastic roofing membranes, pipes, cables, siding, flooring, fencing, and decking.[24] Alternatives to these construction applications would not be as sustainable, environmentally friendly, or adaptable. Because of this, roof consultants and architects often choose thermoplastic membranes when given the choice of roofing materials.

Additionally, the native durability of thermoplastic membranes allows it be printed or colored white, creating a "cool roof" reflecting solar energy, thereby decreasing the energy required to maintain condition spaces. Thermoplastic roofing membranes' innate durability and toughness enable various modern building design applications, including solar installations, green roofs, or entertaining rooftop spaces.

[23] PVC Remains Material of Choice for Life-Saving Medical Devices (plasticstoday.com)
[24] https://www.plasticsnews.com/news/vinyl-institute-recycled-pvc-has-role-infrastructure-projects?

5. Current Environmental Guidance and Concerns About the Formulation of PVC Materials

Throughout its century-long existence, few polymers have faced the level of scrutiny and controversy that polyvinyl chloride (PVC) has endured. This versatile material has been the subject of intense examination by authorities and has faced criticism from numerous non-governmental organizations (NGOs). Some of the most significant concerns have centered on the use of lead and cadmium as stabilizers, the presence of chlorine in PVC, the incorporation of phthalates, and the potential generation of dioxins during its production processes.

Thankfully, the utilization of lead and cadmium as PVC stabilizers has become obsolete, with cadmium being phased out in the US and Canada since 2000,[25] followed by Europe in 2001.[26] Likewise, lead was phased out in the US in 2006[27] and Europe in 2007, [28] marking significant steps toward safer and more sustainable PVC production.

Thermoplastic membranes incorporate additives and plasticizers to protect from UV degradation and keep the membrane flexible. One criticism is that these additives permeate from the membrane and become troublesome in the environment. Fortunately, this is not a concern. Heavy molecular weighted plasticizers ensure thermal stability and flexibility without fear of these additives separating from the membrane. This was shown in the 2013 study by the State of Washington, where water run-off was collected from various roofing materials to see what chemicals leached out. Thermoplastic roofing membrane had zero amounts of plasticizers or phthalates present for all rain events. And as mentioned previously, California has granted this additive, safe issuance.

[25] A Turner, M Filella, Polyvinyl chloride in consumer and environmental plastics, with a particular focus on metal-based additives, Environ. Sci.: Processes Impacts, 2021, 23, 1376-1384, DOI: 10.1039/D1EM00213A
[26] VinylPlus_Contribution-Cefic_Eu-Industry.pdf (stabilisers.eu)
[27] A Turner, M Filella, Polyvinyl chloride in consumer and environmental plastics, with a particular focus on metal-based additives, Environ. Sci.: Processes Impacts, 2021, 23, 1376-1384, DOI: 10.1039/D1EM00213A
[28] VinylPlus_Contribution-Cefic_Eu-Industry.pdf (stabilisers.eu)

PVC and thermoplastic membranes owe much of their unique properties to the presence of chlorine in its monomer structure. This chlorine content alters the polymer's density and imparts several valuable characteristics, including enhanced chemical stability, flame retardancy, durability, and resistance to high temperatures[34]. It is important to distinguish between elemental chlorine, which can indeed be hazardous, and the chlorine chemically bound within PVC itself. While elemental chlorine gas can be problematic, [35] it's essential to recognize that chlorine is a naturally occurring element, ranking as our planet's second most abundant halogen. Moreover, chlorine serves as one of the six essential macronutrients vital for providing ions required for various cellular functions[36] and is primarily found in common table salt,[37] highlighting its ubiquity and significance in the natural world.

The potential for dioxin production has been a source of concern in relation to thermoplastic membranes, [43] but it's important to note that this concern primarily arises when it is improperly disposed of through burning.[44] Thermoplastic roofing membranes' manufacturing and intended use are not the main culprits. Regulations governing the disposal of PVC and thermoplastic membranes have played a crucial role in mitigating the release of dioxins into the environment. Solutions (increased recycling) and regulations have addressed these potential issues. [45,46]

Due to their long lifespan, thermoplastic roofing membranes are a great foundation for solar arrays and vegetative roofs. The life span and highly reflective colors of thermoplastic roofing membranes aid in preventing the urban heat island effect, saving energy, especially in hot summer months where peak demand is a problem, as shown by the Cool Roof Rating Council

[34] Ayodeji Emmanuel Amobonye, Prashant Bhagwat, Suren Singh, Santhosh Pillai, Chapter 10 - Biodegradability of Polyvinyl chloride, Pages 201-220, Editor(s): Anjana Sarkar, Bhasha Sharma, Shashank Shekhar, in Biodegradability of Conventional Plastics, Elsevier, 2023, , ISBN 9780323898584, https://doi.org/10.1016/B978-0-323-89858-4.00017-8.
[35] https://www.greenpeace.org/usa/wp-content/uploads/legacy/Global/usa/report/2009/4/pvc-the-poison-plastic.html
[36]https://chem.libretexts.org/Bookshelves/General_Chemistry/Book%3A_General_Chemistry%3A_Principles_Patterns_and_Applications_(Averill)/01%3A_Introduction_to_Chemistry/1.09%3A_Essential_Elements_for_Life
[37] https://chemistry-guide.com/10-reasons-why-chlorine-is-important/
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Construction-grade PVC materials and thermoplastic roofing membranes (70%) are generally used in durable building and construction applications where decades of service are expected. The service lifetime of materials used in these applications should be considered in the evolving EPR regulations. These products are low carbon, certified, and safe[52] for waterproofing and construction applications.

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SPRI
RD-1
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
11:00 a.m.

AGENDA

I.	Call to Order	L. Donovan
II.	Roll Call & Reading of SPRI Antitrust Statement	
III.	Review current standard (attach)	
IV.	Determine if edits are needed	
V.	Update 2019 canvass list (attach)	
VI.	Timeline	
VII.	Adjournment	

Task Force Objective:
– Liam Donovan, OMG Roofing Products

ANSI/SPRI RD-1 2019

Performance Standard for Retrofit Roof Drains

Approved July 25, 2019

465 Waverley Oaks Road
Suite 421
Waltham, MA 02452

www.spri.org.

Disclaimer

This standard is for use by architects, engineers, consultants, roofing contractors and owners of low slope roofing systems. This standard specifically does not address existing building drainage capacity or overflow drainage requirements and should not be used for those purposes. It is intended to provide data and guidance necessary to understand the implementation and use of retrofit roof drainage elements. Do not assume all existing buildings have code compliant drainage. SPRI, IT'S MEMBERS AND EMPLOYEES DO NOT WARRANT THAT THIS STANDARD IS PROPER AND APPLICABLE UNDER ALL CONDITIONS.

Table of Contents

1 Introduction

This standard is a reference for those that design, specify, or install *retrofit roof drains* which are designed for installation in existing drain plumbing on existing roofs. This standard does not include consideration of all roof storm water drainage code requirements for specific building sites. Design is dictated by local code requirements. As such, this standard shall be used in conjunction with local code and the installation instructions from the manufacturer of the specific *retrofit roof drain*.

2 Definitions

For the purposes of this Document, the following definitions apply:

2.1 Available Inlet Area

The combined area of all the openings in the *strainer*.

2.2 Drain Body

The basic drain, consisting of the *drain flange* and interconnected *drain stem*. There may be a sump between the flange and the stem.

2.3 Drain Flange

The part of the *drain body* that extends horizontally, in the plane of the roof. It is used for attachment of the drain to the roof deck and for clamping and sealing the roof membrane flashing plies to the drain.

2.4 Drain Flashing

The watertight connection(s) between the *retrofit roof drain* and the existing roofing system.

2.4.1 Clamping Ring

A component of the *retrofit roof drain* that creates a mechanical compression seal with the membrane flashing plies by clamping the membrane flashing plies between the *clamping ring* and the *drain flange*.

2.4.2 Heat Welding

A method for creating a watertight seal between the electric heat-welded membrane flashing plies and the *drain flange*.

2.4.3 Backflow Seal

The part of the *retrofit roof drain* that creates a watertight mechanical compression seal between the *drain stem* and the existing plumbing

2.5 Drain Stem

A part of the drain that is inserted through the existing roof drain bowl for connection to the existing roof drain plumbing. The *backflow seal* is integral to the stem.

2.6 Effective Drain Diameter

The least cross-sectional flow area between the *drain body* and the outlet of the *drain stem* expressed as a diameter.

2.7 Retrofit Roof Drain

A factory fabricated drain, installed within an existing roof drain on an existing roof. *Retrofit roof drains* are installed from the roof surface and are provisional with a horizontal flashing flange for adhering membrane flashing materials, and coupling to provide a mechanical backflow compression seal to the existing plumbing. A *retrofit roof drain* is designed so that it may be installed without removing the existing roof *drain body* and plumbing.

2.8 Strainer

A component of the drain which minimizes amount of debris that enters the drain.

3 General Design Considerations

3.1 The drain manufacturer's installation instructions shall reference the information required for proper installation of the roof *drain body*, *backflow seal*, and *strainer* and shall include at least the following:

3.1.1 A requirement that all *retrofit roof drain* installations shall meet the requirements of this standard and the requirements of the local authorities having jurisdiction. Where local codes conflict with this standard, local codes shall have priority.

3.1.2 A description of the *drain body*, *backflow seal* and *strainer* and the equipment needed for proper assembly and installation.

3.1.3 Information regarding proper storage and handling of the *retrofit roof drain* materials prior to and during installation.

3.1.4 Description of all limitations, special installation instructions and design criteria associated with the performance of the *retrofit roof drain*.

3.2 The *retrofit roof drain* size shall be the proper size to be compatible with the existing drain. It shall provide adequate performance based on the more stringent flow requirements of either, the governing building code, or the flow requirements as noted in Section 8. See Table 1 in the Commentary of this Standard.

3.3 Roofing Watertight Seal

The bond between the roof membrane and the *drain flange* shall provide a watertight seal using a manufacturer's approved water block adhesive and *clamping ring*, with bolts evenly cinched to membrane or by *heat welding* to the roofing membrane.

3.4 Backflow Seal

The *backflow seal* shall extend below the top of the existing drain and be long enough to create a watertight connection with the properly prepared and cleaned interconnecting portion of the existing drain system.

4 Materials

Retrofit roof drains shall be constructed of polymeric or metal materials or any combination of metals and polymeric materials that have been judged to perform satisfactorily in the rooftop environment. Manufacturers shall be contacted to determine membrane system compatibility.

5 Testing

Retrofit roof drain manufacturers shall test samples that are representative of standard production per the RF-1 test specified in this section.

5.1 Leakage

Drain bodies with *backflow seals* shall withstand a continuous test pressure under the equivalent of a 10-foot head of water or 4.33 lbf./in.^{2} (30 kPa) above the elevation of the *backflow seals* without any visible leakage after 24 hours. Laboratory test method RF-1 shall be used to test the *backflow seals*.

Test RF-1

Setup

Insert a representative *retrofit roof drain* into a vertical plumbing pipe large enough to receive the *retrofit roof drain* stem and the *backflow seals*. Seal the existing plumbing pipe below the *drain stem*-to-plumbing pipe juncture. Affix a vertical pipe at least 10 ft. long (3.05 m), but of any convenient diameter that can be sealed to the *drain body* so that water can flow through the pipe and into the seal between the plumbing and the backflow gasket.

Method

Fill the pipe with water to a height of 10 ft. (3.05 m) above the *backflow seal*. The test shall be conducted for a minimum of 24 hours -0/+1 hour during which the 10-foot head of water shall be maintained.

Test Results

The drain shall be acceptable if there is no visible leakage at the *backflow seal*.

6 Strainers

Strainers extending above the surface of the roof, shall extend not less than 4 in. (100 mm) above the surface of the roof immediately adjacent to the roof drain. To facilitate normal flow of water, dome shaped *strainers* shall have an available inlet area, above roof level, of not less than one and one-half times the inside cross-sectional area of the drain diameter.

7 Installation

The *retrofit roof drain* shall be installed in compliance with the drain manufacturer's instructions. The roof cover tie-in shall be completed in compliance with the roof cover manufacturer's instructions.

8 Flow requirements

Flow capacity calculations shall be based on the *effective drain diameter*. There shall be a sufficient drainage to accommodate a one-hour rainfall rate base on a 100-year return period or the local code, whichever number is greater. Local code requirements for overflow requirements shall be confirmed with a local building code representative. Consult Commentary Figure 1 or local weather stations for local statistics.

Where separate roof sections are drained independently, flow calculations shall be performed on each section. Each section shall have at least one drain. Drain capacities shall be determined from the applicable plumbing code. See Commentary Table 1. Pipe diameter shall be the inside diameter of the retrofitted *drain stem*, not the original drain diameter.

Commentary

This Commentary consists of explanatory and supplementary material designed to help designers, roofing contractors and local building authorities in applying the requirements of the preceding Standard. It is intended to create an understanding of the requirements through brief explanations of the reasoning employed in arriving at these requirements.

This Standard addresses the design of retrofit primary drains. Note that local codes may also require a secondary or overflow drain and this secondary drain may be required to have greater flow capacity than the primary drain

Flow requirements

Flow capabilities are addressed in the Standard. There should be sufficient total cross-section area of drains to drain the entire roof area. Drain rates in Table 1 can be approximated using the following formula:

$$A = 464 \times D^{2.66} \div r$$

A = area drained ($ft.^2$)
D = drain diameter (in.)
r = rainfall rate (in./hr.)

The International Code Council/International Plumbing Code Formula (ICC/IPC) (Q = 0.0104 x A x i) will produce slightly different values.

Q = Volumetric Flow Rate (gal./min.)
A = Roof Area ($ft.^2$)
i = Rainfall rate (in./hr.)

Existing drain capacities frequently exceed requirements. When more drain capacity is needed, consult with the *retrofit roof drain* manufacturer for a compatible solution.

Alternative Drain Specification Method

Table 2 may be used to check to see if sufficient drains exist on the retrofit roof. Pipe diameter is that of the retrofitted drain, not the original drain diameter.

Table 1
Roof Areas (ft.²) Drained vs. Drain Diameter and Rainfall Rates

Rainfall in./hr.	Drain Diameter (in.)					
	2	3	4	5	6	8
.8	3,670	10,780	23,170	41,950	68,130	146,440
1.0	2,930	8,620	18,540	33,560	54,500	117,150
1.2	2,440	7,190	15,450	27,960	45,420	97,620
1.4	2,090	6,160	13,240	23,970	38,930	83,680
1.6	1,830	5,390	11,580	20,970	34,060	73,220
1.8	1,630	4,790	10,300	18,640	30,280	65,080
2.0	1,470	4,310	9,270	16,780	27,250	58,570
2.5	1,170	3,450	7,410	13,420	21,800	46,860
3.0	980	2,870	6,180	11,190	18,170	39,050
3.5	840	2,460	5,300	9,590	15,570	33,470
4.0	730	2,160	4,630	8,390	13,630	29,290
4.5	650	1,920	4,120	7,460	12,110	26,030
5.0	590	1,720	3,710	6,710	10,900	23,430

Drainage areas in Table 1: Vertical façades (walls), that can shed wind-driven rain onto roof sections, should be accounted for when determining effective roof areas. Tributary vertical façade areas are generally considered to be 50% effective—that is, the tributary wall area is reduced by 50% to determine the equivalent effective tributary roof area which is then added to the roof section drainage area to determine the total effective roof drainage area.

Table 1 may be interpolated for intermediate effective pipe diameters and rainfall rates. Drainage areas assume roof conditions will allow sufficient water flow to the drain.

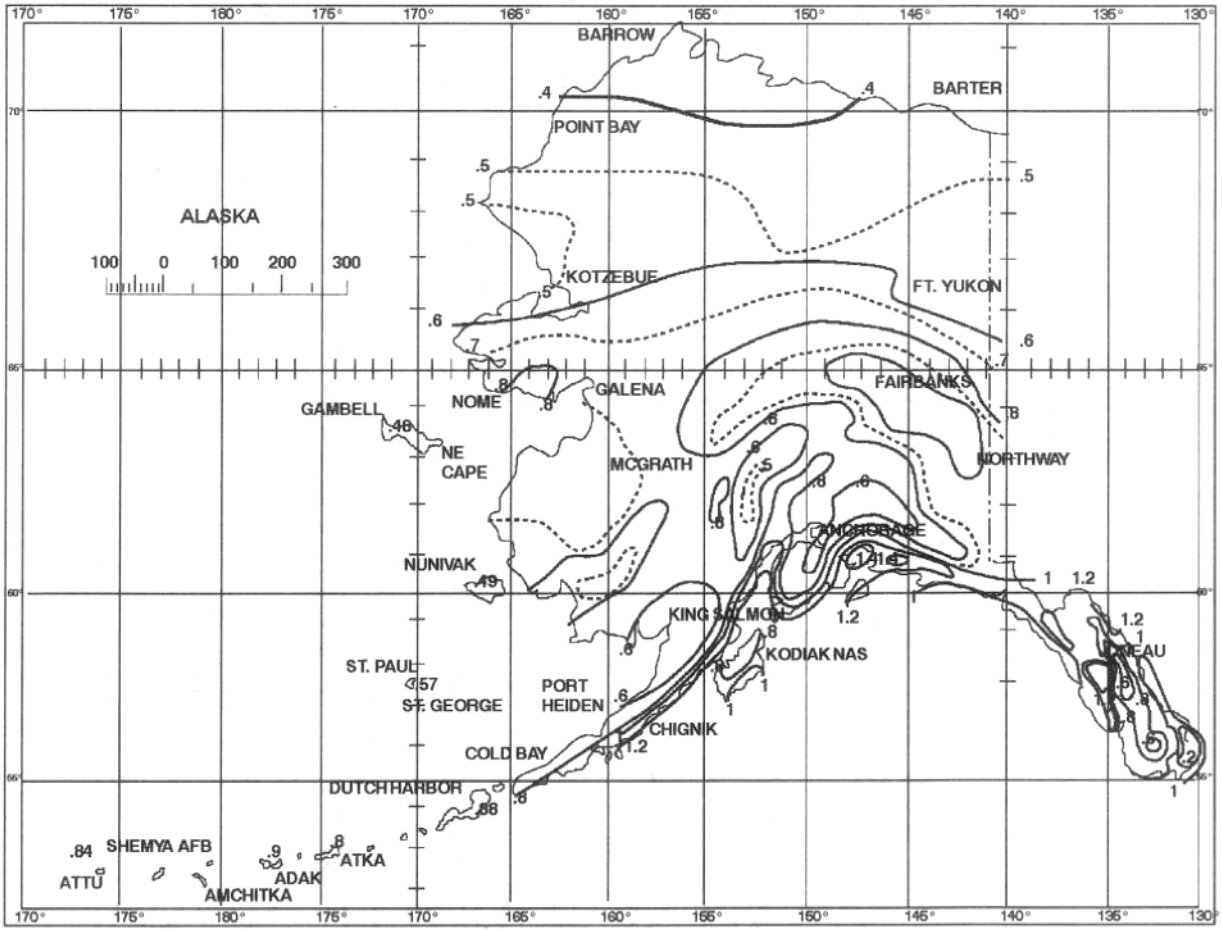
Table 2

Minimum Number of Drains per Thousand Squares (100,000 ft.²)

Rainfall in./hr.	Drain Diameter (in.)					
	2	3	4	5	6	8
0.8	28	10	5	3	2	1
1.0	35	12	6	3	2	1
1.2	41	14	7	4	3	2
1.4	48	17	8	5	3	2
1.6	55	19	9	5	3	2
1.8	62	21	10	6	4	2
2.0	69	24	11	6	4	2
2.5	86	29	14	8	5	3
3.0	103	35	17	9	6	3
3.5	120	41	19	11	7	3
4.0	137	47	22	12	8	4
4.5	154	53	25	14	9	4
5.0	171	58	27	15	10	5

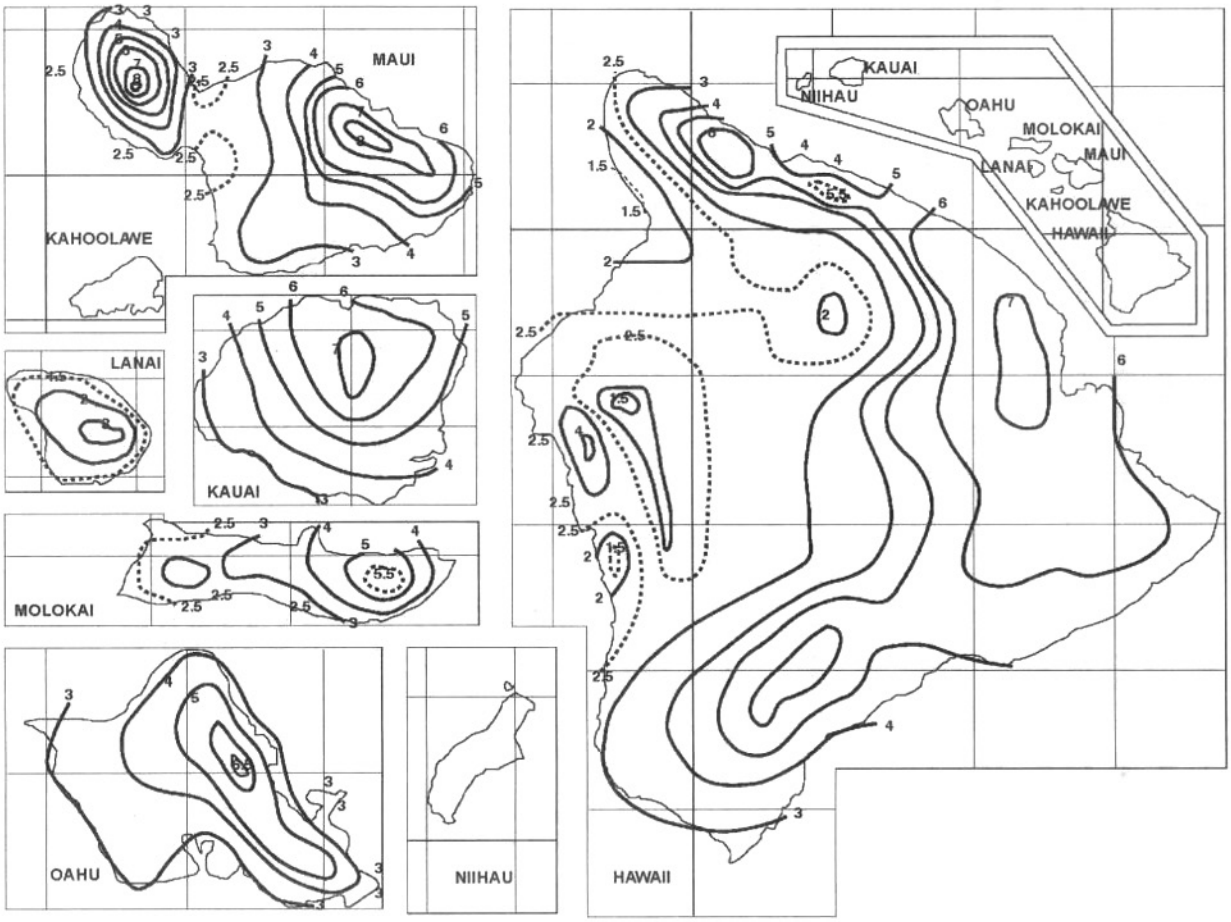
Drain sizing tables should be used with care. Roof design may not be capable of conducting rain from a very large area (ex: 40,000 ft.²), to a single drain even if the drain could handle the water flow.

One-Hour 100-year Return Rainfall Rates[1]
Figure 1b: For Alaska



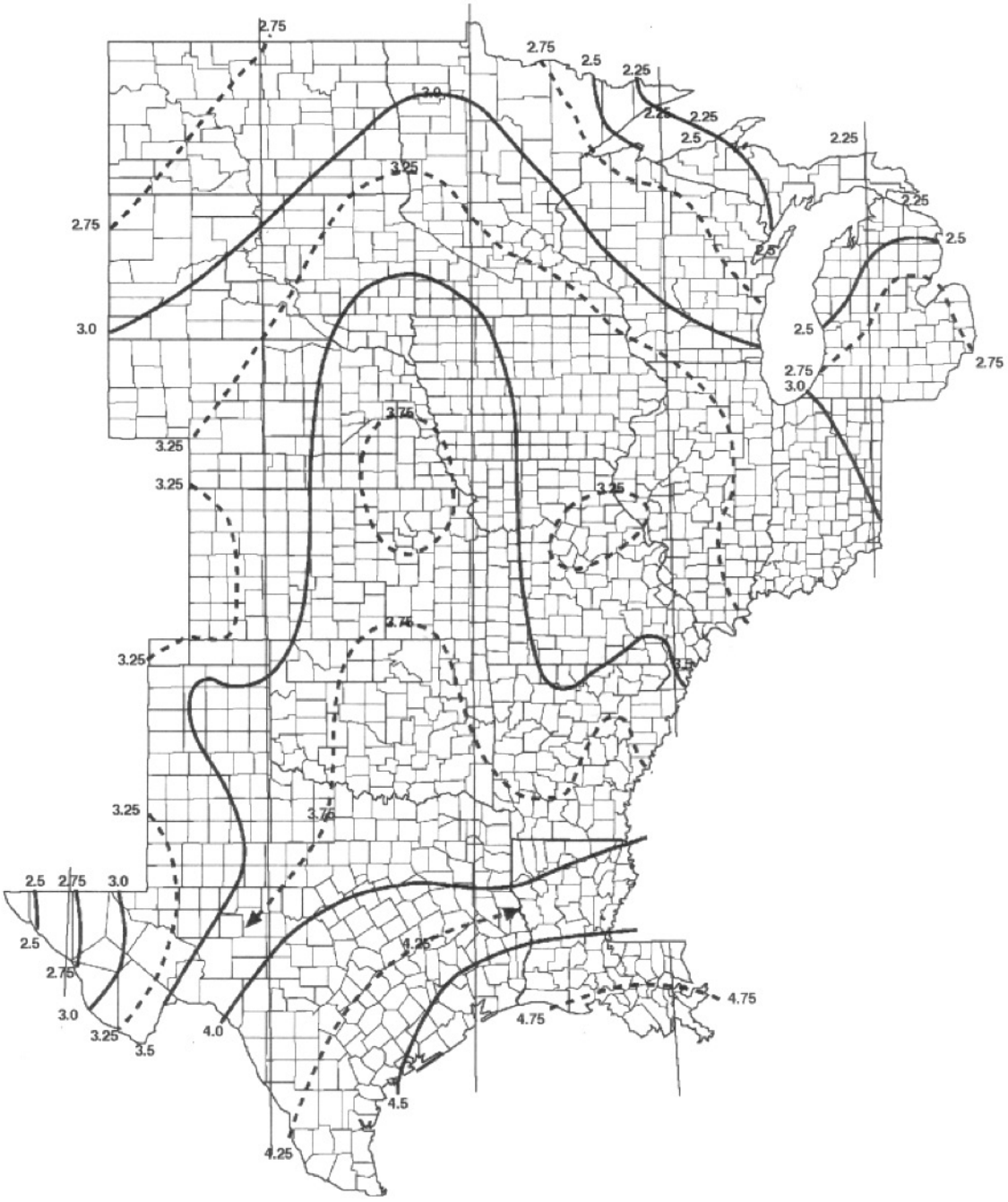
1. Source: National Weather Service, National Oceanic and Atmospheric Administration, Washington D.C.

One-Hour 100-year Return Rainfall Rates[2]
Figure 1c: For Hawaii



2. Source: National Weather Service, National Oceanic and Atmospheric Administration, Washington D.C.

One-Hour 100-year Return Rainfall Rates[3]
Figure 1d: For Central U.S.

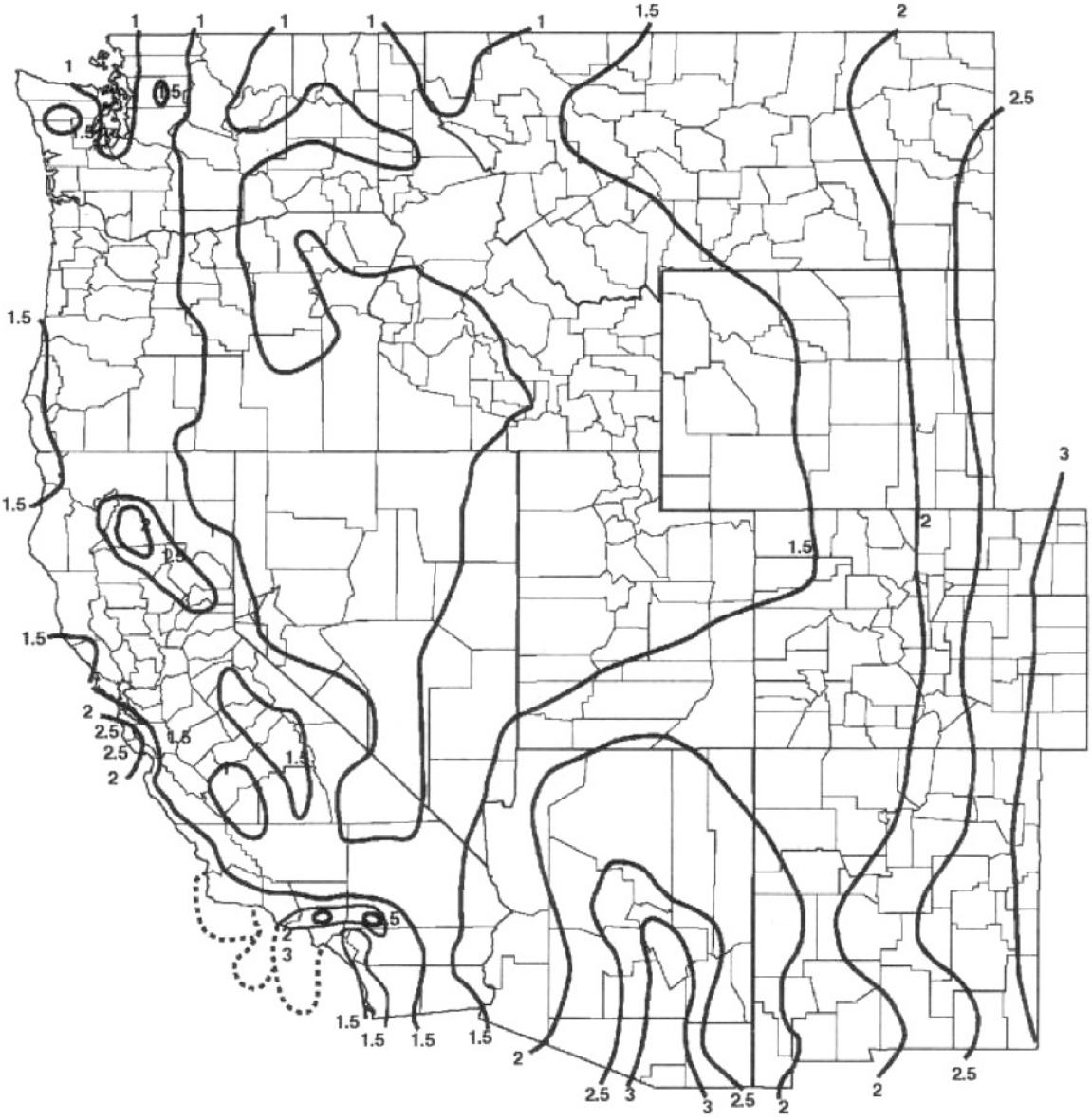


4. Source: National Weather Service, National Oceanic and Atmospheric Administration, Washington D.C.

One-Hour 100-year Return Rainfall Rates[4]
Figure 1e: For Eastern U.S.

3. Source: National Weather Service, National Oceanic and Atmospheric Administration, Washington D.C.

One-Hour 100-year Return Rainfall Rates[5]
Figure 1f: For Western U.S.



5. Source: National Weather Service, National Oceanic and Atmospheric Administration, Washington D.C.

Ballot Name:	Approval of BSR_SPRI RD-1 20xx Performance Standard for Retrofit Drains Ballot 1
Ballot URL:	https://standards.spri.org/higherlogic/ws/groups/938a6b79-de08-495d-8317-4140401e5f87/ballots/ballot?id=122
Ballot Status:	Ballot has closed.
Total Votes:	10

Vote Summary

Option	Count	Percent
Affirmative	10	100%
Negative w/comment	0	0%
Abstain	0	

Company Name	Voter Name	Vote	Interest Categories	Voting Role	Email Address
Atlas Roofing Corporation	Moskowitz, Steve	Affirmative	Other Producer	Member	smoskowitz@atlasroofing.com
Benchmark, Inc.	Reynolds, Andrew	Affirmative	User	Member	AReynolds@benchmark-inc.com
Carlisle Construction Materials Incorporated	Malpezzi, Joseph	Affirmative	Other Producer	Member	Joe.Malpezzi@carlisleccm.com
Dedicated Roof & Hydro-Solutions, LLC	Hawn, David	Affirmative	User	Member	drhawn@drhroofsolutions.com
Ennis Associates	Ennis, Michael	Affirmative	General Interest	Member	csennis@mac.com
OMG Roofing Products	Childs, Stephen	Affirmative	Producer	Group Chair	schilds@olyfast.com
RCI, Inc.	Edwards, Wanda	Affirmative	General Interest	Member	we@wandaedwardsconsulting.com
Sika Sarnafil Inc.	Darsch, Mike	Affirmative	Other Producer	Member	darsch.michael@us.sika.com
StanCConsulting	Choiniere, Stan	Affirmative	User	Member	stancconsult@comcast.net
Trufast, LLC	Alexander, Brian	Affirmative	Producer	Member	balexander@trufast.com
Tech Roofing Services	Narkawicz, Joe	Did not vote	User	Member	jnarko@gmail.com

Producer	2
Other Producer	3
User	4
General Interest	2
	11

SPRI
Resiliency Standard
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
10:30 a.m.

AGENDA

I. Call to Order M. Ibanez

II. Roll Call & Reading of SPRI Antitrust Statement

III. Confirm need for SPRI to take a position or making a statement on a definition to Resiliency
(Reference July 11, 2023 Minutes)

IV. Determine the type of document to be produced (White Paper has had most support)
a) Position Statement
b) White Paper
c) Specification
d) Standard

V. Review "SPRI Resiliency Standard Task Group work sheet Nov. 17, 2023" & "Revised version from Jim Kirby—Sept 15 2023" (attached)

VI. Adjournment

Task Force Objective:
– Mario Ibanez, Seaman Corporation
start date 10/2010 budget: $0

The objective of this Task Force is to develop a position paper on the definition of resilience as it relates to low slope single ply roofing systems to provide guidance to the roofing industry.

SPRI
Resiliency Standard
Crowne Plaza at the Crossings
Warwick, RI
July 11, 2023

Minutes

The Task Force meeting was called to order by Technical Committee Chair Stephen Childs at 1:00 p.m. ET and the SPRI Antitrust statement was read.*

Roll Call

Those present were:

Warren Barber, National Gypsum
Brian Chamberlain, Carlisle Construction Materials
Gareth Christopher, Siplast
Nick Eschhofen, Trufast
James Kirby, Siplast
Christopher Mader, Blue Ridge Fiberboard Inc
Brian Martineau, IB Roof Systems
Tim McQuillen, John Manville
Christopher Meyer, Seaman Corporation
Steve Moskowitz, Atlas Roofing Corporation
Drew Nehrenz, OMG Roofing Products
Brian Ng, All weather insulated Panels
Andrew Reynolds, Benchmark, Inc.
Dan Scheerer, SFS
Joel Stanley, Anchor Products
Shawn Stanley, IB Roof Systems
Steven Wadding, Polyglass U.S.A. Inc.

Guest present:

Sam Everett, SE Marketing LLC

Staff present:

Amanda Hickman, The Hickman Group
Linda King, SPRI Managing Director

Discussion

The Task Force discussed resiliency as it is seen today. The consensus was that the term resiliency is too broad and is oftentimes used interchangeably with sustainability.

It was brought up that ASTM is working on a resiliency guide. CSA also has a state of good practices guide CSA A123.26. Both could be good reference materials.

Overall, the SPRI Task Force is unsure of which direction to go. It was decided the best first step is to research the current state for resiliency and find out what opinions exist, who is working on new documents surrounding resiliency, and from there SPRI can make a more informed decision on which direction to go.

Mario Ibanez volunteered to lead the Task Force moving forward with support from Steve Wadding as co-chair.

*SPRI Antitrust Statement: SPRI complies with antitrust laws and requires participants in its programs to comply with antitrust laws. Discussions which could affect competitive pricing decisions or other competitive factors are forbidden. There may be no discussions of pricing policies or future prices, production capacity, profit margins or other factors that may tend to influence prices. In discussing technical issues, care should be taken to avoid discussing potential or planned competitive activities. Members and participants should be familiar with the SPRI Antitrust Policy and act in conformity with it

Action Items:

1. Work with Linda King to get a site together for uploading all reference materials; and
2. Schedule an update call for late August or early September to go over the information gathered at that point.

Adjournment

There being no further business the Task Force meeting adjourned at 1:48 p.m. ET.

Submitted: Stephen Childs, Technical Committee Chair

These minutes have been reviewed by SPRI Legal Counsel.

Return to Schedule

SPRI Resiliency Standard Task Group work sheet Nov. 17, 2023

Resiliency Standard, Quarterly Technical Meeting,
Sheraton Hotel O'Hare, Chicago
Date: October 17th, 2023, 2:00 PM

i. The discussion was primarily centered on the definition of "Resiliency" as a position on what Resiliency means to low slope roofing. The discussion will be on going and inputs welcome from SPRI members. Continue to further develop the points listed in the initial definition, into a white paper.
ii. Action item:
    a. Share ideas among SPRI members for comments. Encourage discussion via SPRI website tool.
    b. Review ASTM 7851
    c. Review IBHS Fortify Program
    d. It was also discussed to continue development the position paper from the existing definition, which will continue from Revised version from Jim Kirby—Sept 15, 2023

The following are definitions of resiliency as found on internet websites, as well as publications of documents on the topic of resiliency.

Definition of Resilient, Resilience (Resiliency) as found on WWW	blank
https://www.merriam-webster.com/dictionary/resilient	Resilient (adjective) re·sil·ient, ri-ˈzil-yənt : characterized or marked by resilience: such as a : capable of withstanding shock without permanent deformation or rupture b : tending to recover from or adjust easily to misfortune or change Resiliently (adverb)
resilient adjective - Definition, pictures, pronunciation and usage notes | Oxford Advanced Learner's Dictionary at OxfordLearnersDictionaries.com	Resilient (adjective) /rɪˈzɪliənt/ 1 able to recover quickly after something unpleasant such as shock, injury, etc.
https://www.merriam-webster.com/dictionary/resilience	Resilience (noun) re·sil·ience, ri-ˈzil-yən(t)s 1 : the capability of a strained body to recover its size and shape after deformation caused especially by compressive stress 2 : an ability to recover from or adjust easily to misfortune or change
resilient adjective - Definition, pictures, pronunciation and usage notes | Oxford Advanced Learner's Dictionary at OxfordLearnersDictionaries.com	Resilient adjective /rɪˈzɪliənt/ 1 able to recover quickly after something unpleasant such as shock, injury, etc.
Resilience Definition & Meaning | Britannica Dictionary	Resilience /rɪˈzɪljəns/ noun 1 : the ability to become strong, healthy, or successful again after something bad happens 2 : the ability of something to return to its original shape after it has been pulled, stretched, pressed, bent, etc.
Other documents for reference.	blank

Return to Schedule

SPRI Resiliency Standard Task Group work sheet Nov. 17, 2023

ASTM E3341 Standard Guide for General Principles of Resilience (astm.org)	Excellent document on Resiliency.
ASTM D7851 Standard Guide for Design of Sustainable, Low-Slope Roofing Systems (astm.org)	Not pertinent or only peripherally pertinent to Resiliency.
FORTIFIED Commercial - FORTIFIED - A Program of IBHS (fortifiedhome.org)	Certification program that has more to do with quality of construction in reference to local codes and building practices that exceed minimum codes. From the insurance perspective of loss prevention, termed resiliency.
Community Resilience Planning Guide for Buildings and Infrastructure Systems, Volume I | NIST	Way outside the scope of this Task Force. Has to do with, "the role that buildings and infrastructure play… social and economic functions…have plans in place to rebuild in a thoughtful way…including coordination with state and federal agencies…National Preparedness Goal.
Resilience | FEMA.gov	Outside of the scope of this Task Force
CSA A123.26:21 | Product | CSA Group Performance Requirements for climate resilience of low slope membrane roofing systems	Outside of the scope of this Task Force. This is a building Code.
ASTM DOI: 10.1520/ACEM20170136 Defining Resilience	Compares the definition of resilience from 6 different organizations and develops a single definition: "Resiliency can be accomplished through risk assessment, design, construction and preparation" "Plan…; Adapt…; Withstand…; Recover…;"

Continuing for discussion from: "Objective_Consensus_Statement_draft.v1_9-8-2023_w Kirby comments"

- For further development and member input.

A revised version from Jim Kirby—Sept 15 2023

Resiliency (noun), as it relates to low-slope roofing systems, is defined as:
the capability/ability to absorb and continue to perform after adverse climatic conditions occur, including but not limited to rain, wind, hail, fire, chemical contamination, and/or unanticipated climatic phenomena, or any otherwise disruptive event above what the commonly intended purpose is or above what is reasonably expected to withstand, as defined by code minimums.

Definition commentary:
A resilient roof system will continue to protect human life and well-being, protect and maintain building contents, and allow a *reasonable* (?) level of uninterrupted use of a building or facility with little or no repairs to the roof system (i.e., the roof does not fail or need replacement). Roof system resilience anticipates a level of adverse climatic conditions exceeding minimum code requirements and is provided by designing and planning a roof system, including proper maintenance during operational use, that to have capabilities above current code requirements.

Resiliency (noun), as it relates to low-slope roofing systems, is defined as:

Resilient (adjective) as it relates to low-slope roofing systems, is defined as:	MIbanez, change to adjective

the capability/ability to absorb and continue to perform after adverse climatic conditions occur,

including but not limited to rain, wind, hail, fire, chemical contamination,

including but not limited to UV, rain, wind, hail, fire, chemical contamination,	MIbanez added UV

SPRI Resiliency Standard Task Group work sheet Nov. 17, 2023

and/or unanticipated climatic phenomena,

or any otherwise disruptive event[1]

above what the commonly intended purpose is

or above what is reasonably expected to withstand, as defined by code minimums.

Definition commentary:

A resilient roof system will continue to protect human life and well-being,

protect and maintain building contents,

and allow a *reasonable* (?) level of uninterrupted use of a building

or facility with little or no repairs to the roof system

(i.e., the roof does not fail or need replacement).

or allows for temporary immediate repairs to regain [1]operational recovery, until [1]functional recovery can be made	MIbanez

Roof system resilience anticipates a level of adverse climatic conditions exceeding minimum code requirements

and is provided by designing and planning a roof system,

including proper maintenance during operational use,

that to have capabilities above current code requirements.

The following was from "SPRI Resiliency Standard Task Group, work sheet Aug. '23"
Also see; "Objective_Consensus_Statement_draft.v1_9-8-2023_w Kirby comments"

ICC

1. Merriam-Webster
    a. Resilience noun

i. : the capability of a strained body to recover its size and shape after deformation caused especially by compressive stress.
ii. : an ability to recover from or adjust easily to misfortune or change

b. Resilient adjective
i. : capable of withstanding shock without permanent deformation or rupture
ii. : tending to recover from or adjust easily to misfortune or change

c. Resilient adverb

2. Britannica Dictionary
a. Resilience adverb
i. able to become strong, healthy, or successful again after something bad happens
1. resilient young people
2. resilient competitors
3. The local economy is remarkably resilient.
ii. able to return to an original shape after being pulled, stretched, pressed, bent, etc.
1. a resilient material

3. Global Resiliency Dialog
a. https://www.iccsafe.org/advocacy/global-resiliency/
b. Building Resilience – as Defined by the Global Resiliency Dialogue
i. *"The ability of a building, structure and its component parts to withstand current and future climatic conditions (including wildfire/bushfires, extreme wind, extreme rainfall and extreme heat), to minimize the loss of functionality and recovery time without being damaged to an extent that is disproportionate to the intensity of the events experienced, and to preserve the intended level of performance at the time of construction over the proposed service life of the building.*

4. The Nuts and Bolts of Resilient Roof Design, James Kirby, Building & Roofing Science Architect, GAF
a. A Resilient Roof System includes…
i. Wind Resistance
ii. Impact Resistance
iii. Daylighting
iv. Insulation
v. Rooftop Color
vi. Rooftop Energy Production and Storage
vii.
b. The presentation seems to say that following; meeting or exceeding current roofing codes is the mark of a resilient roof.

5. Resilient and Adaptable Roof System Design, Jennifer Keegan, AAIA and James R. Kirby, AIA
a. "Sustainability focuses on roofing products' effects on the future;"
b. "…resilience focuses on roofing assemblies' ability to endure."
c. "Sustainability and resilience are often coupled and can be opposing at times"
d. "Broadly, sustainability is the capacity for human health and well being, economic vitality and prosperity, and environmental resource abundance."
e. Resilience is the capacity to overcome unexpected problems, continue or rapidly bounce back from extreme events, and prepare for and survive catastrophes.

6. CSA A123.26, Performance requirements for climate resilience of low slope membrane roofing systems.
a. Seems to define resiliency as meeting Code requirements.

SPRI Resiliency Standard Task Group work sheet Nov. 17, 2023

b. Is the intent of the CSA A123.26:21 Standard, for it to be used for design based on the prediction of future climatic conditions?

7. ASTM E3341
   a. Good start to creating a Resiliency Standard definition.
8. ASTM DOI: 10.1520/ACEM20170136 Defining Resilience. VOL. 7 / NO. 1 / 2018
   a. "Conclusion – The definitions and phrase used to define resilience from six sources were compared."
      i. "Industry Statement on Resiliency," American Institute of Architects, 2017 https://perma.cc/8PMM-AT4E?type=image (accessed 31 Aug. 2023).
         1. "…we define resilience as the ability to prepare and plan for, absorb recover from, and successfully ad adapt to adverse events."
      ii. United States Department of Homeland Security
         1. "PPD-21 defines resilience as the ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents.
      iii. National Institute of Standards and Technology (NIST)
      iv. Community And Regional Resilience Institute
      v. Resilient Design Institute
      vi. USGBC

9. ASTM DOI: 10.1520/ACEM20170136 Defining Resilience. VOL. 7 / NO. 1 / 2018
   a. Is an important statement considering how many organizations signed on. **No indication of changes since first published in 2010.**

Thoughts-Comments

- Resilience alludes to standing up to more than a person, material, product, system, assembly…etc. above and beyond what it's intended purpose is, is designed to withstand or can be reasonably expected to withstand.
- Code and design intent is typically based on what can be a reasonable expectation.
- Should we be defining, stating, or creating a Resilience Standard as an adjective, noun, or adverb…?
- Is resilience being defined to be used as a marker or benchmark, as a measure of performance?
- E3341 – 22, 3.2.2 disruptive event, n- an event over a short timeframe that may impact a system to a degree that the system is unable to perform its intended function or service.
- 3.2.3.1 - Continues to perform with moderate, little or no repairs or has failed (in terms of permanence) and needs replacement but continues to provide the operational recovery until functional recovery is restored.
- 3.2.4.1 – Resiliency supports sustainability and durability, which would not exist with out resiliency. (comment)
- I disagree that resilience is something you design for. If so designed, then it is expected and if it does not perform, then it is a failure. If it performs beyond its design intent , then it is resilient.
- 4.8 and 4.9 - Guide to qualify and quantify resilience.

Return to Schedule

1st. draft Objective Consensus Statement 9-8-2023

Note: As a result of 6-Sept 2023, 3:30 PM Zoom Meeting discussion on creating a SPRI Resiliency Standard: first attempt at drafting a consensus statement for SPRI Board review.

The following is/was my best attempt at recording each person comment during the discussion:

- Maro Ibanez
  a. Create a position paper on what is (definition) of resilience.
- Steve Wadding
  a. First thing is to write a definition of what is a Resilient Roof;
     i. More of a position type of paper, what does it mean to SPRI.
     ii. Repairability; the ability to bounce back.
- Christopher R. Mader
  a. Existing documents are not really defining resilience they are more providing a frame work: how resiliency providing a category for wind, hail, fire etc.
- Chadwick Collins
  a. Look at Standards / Guides / Practice
     i. Position paper should say what roof needs to be resilient.
     ii. Determined by design professional.
     iii. What are things to keep in mind to not take away from the roof resilience?
- Stephen Childs
  a. Position paper would make more sense; at some point stretch it to a design position.
     i. The Fortified Program through IBHS

Start of draft.v1 SPRI Resiliency Position Paper / Statement

The definition of resiliency as it relates to low slope roofing system in its performance to protect human life, well-being, and property.

Is the capability to prepare and plan for, with the proper maintenance and operational use, the roofs' ability to absorb, recovery[i] from and successfully adapt to adverse climatic conditions, including but not limited to rain, wind, hail, fire, chemical contamination, or extra climatic phenomena, or otherwise disruptive event[ii] above and beyond what the intended purpose is, is designed to withstand, or can be reasonably expected to withstand.

Continues the ability to protect and maintain personal safety, building contents, and facility operations, without interruption over time with little or no repairs or has failed (in terms of permanence) and needs replacement but continues to provide the operational recovery until functional recovery is restored[iii].

- Create an objective consensus statement.
  - Create a position paper for SPRI
  - No need for funding
    - Non at this time
  - Mile stone
    - Second Draft by September 22nd
    - Final Draft by October 6

[i] recovery ASTM E3341 – 22, Discussion 3.2.3.1
[ii] disruptive event ASTM E3341 - 22, Terminology 3.2.2.1
[iii] recovery ASTM E3341 – 22, Discussion 3.2.3.1

1st. draft Objective Consensus Statement 9-8-2023

A revised version from Jim Kirby—Sept 15 2023

Resiliency (noun), as it relates to low-slope roofing systems, is defined as:
the capability/ability to absorb and continue to perform after adverse climatic conditions occur, including but not limited to rain, wind, hail, fire, chemical contamination, and/or unanticipated climatic phenomena, or any otherwise disruptive event above what the commonly intended purpose is or above what is reasonably expected to withstand, as defined by code minimums.

Definition commentary:
A resilient roof system will continue to protect human life and well-being, protect and maintain building contents, and allow a *reasonable* (?) level of uninterrupted use of a building or facility with little or no repairs to the roof system (i.e., the roof does not fail or need replacement). Roof system resilience anticipates a level of adverse climatic conditions exceeding minimum code requirements and is provided by designing and planning a roof system, including proper maintenance during operational use, that to have capabilities above current code requirements.

SPRI
RP-14 Revision
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
2:30 p.m.

AGENDA

I. Call to Order — C. Mader

II. Roll Call & Reading of SPRI Antitrust Statement

III. Review balloting feedback (balloting to close in early January)
Develop game plan to address any feedback (if any)

IV. Adjournment

Task Force Objective:
-Chris Mader, Blueridge Fiberboard
start date 04/2023

The ANSI/SPRI RP-14, *Wind Design Standard for Vegetative Roofing Systems,* will be edited to remove information no longer relevant to the standard, and canvassed for re-approval as an American National Standard.

465 Waverley Oaks Road, Suite 421 – Waltham, MA 02452
t. 781.647.7026 f. 781.647-7222 e. info@spri.org

SPRI
Standards Library and Template
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
3:00 p.m.

AGENDA

I. Call to Order — C. Mader

II. Roll Call & Reading of SPRI Antitrust Statement

III. Update Items Reports & Updates
   A. Task Force Chair to bring the testing standard template document to the Technical Committee and Board of Directors for approval (did not follow standard operating procedure in October). Task force already approved the document to send along in the process in October.
   B. Discussed the potential need or usefulness of a guideline document and/or best practices document, for white papers with Sam Everett during an in-person meeting for Internal Pressure Task Force

IV. Next Steps

V. Adjournment

Task Force Objective:
–Chris Mader, Blue Ridge Fiberboard
start date 01/2023

The Standards Template Library Task Force objective is to update and modify the SPRI 'Glossary of Terms', using existing SPRI standards and documents, and create template documents, with the goal of creating consistency across SPRI standards, and making the standard development process more efficient.

Return to Schedule

SPRI 20XX

Test Standard for <Insert a title that provides a simple/general overview which aligns with the Scope in 1.1>

Table of Contents

Return to Schedule

1.0 Introduction

1.1 Scope

This standard provides basic requirements and procedures for determining <insert language that clearly establishes the type of testing and purpose of the test>

1.2 Reference Documents

1.2.1 *Include appropriate reference documents as needed. Skip if unnecessary and delete 1.2.1.*

1.3 Significance and Use

1.3.1 *Provide context for when and how the standard can be used*

2.0 General Information

2.1 Definitions

All words defined within this section are italicized throughout the standard. Additional definitions are available at <include a link to SPRI library/glossary of terms>. *The glossary of terms that the SPRI Standards Template Library Task Force establishes will serve as the default for all definitions and need not be included in this section. However, should there not be a definition established in the SPRI glossary of terms, or should the context of the definition be different for the needs of the standard, it shall be included in this section.*

2.2 Apparatus

2.3 Test Specimen Sourcing

2.3.1 All specimens shall be provided by the program sponsor or component supplier and tested as received.

2.3.2 All specimens shall be preconditioned at standard laboratory conditions, 73 ± 4°F (23 ± 2°C) and 50% relative humidity ± 5%.

3.0 <Insert shorthand name of test method, ex: GT-1, BPT-1, etc.> Procedure

3.1 Test Specimen Setup

3.1.1 Adequate personal protective equipment shall be available and in use, such as eye protection.

3.1 Test Method

3.2.1 Testing shall be conducted in standard laboratory conditions, 73 ± 4°F (23 ± 2°C) and 50% relative humidity ± 5%.

4.0 Reporting – Test reports shall include the following:

4.1 Name and address of the manufacturer or supplier of each test specimen component.

4.2 Name or other identification marks of each test specimen component, including any relevant listing and labeling marks.

4.3 Description of each test specimen component.

4.4 Conditioning of the test specimens, environmental data during the test (temperature, RH, etc.).

4.5 Identification of the laboratory technician.
4.6 Identification of the test equipment and instruments used, including open area dimensions of the *substrate board* holding device.
4.7 Calibration date of the tensile test machine.
4.8 Any deviations from the test method.
4.9 *Maximum Failure Load* of each test specimen (lbf and N).
4.10 Mode of failure of each test specimen.
4.11 Statistics. See Appendix A – Commentary C4.9 for additional information.

5.0 Precision and Bias – There is not enough data available to establish precision and bias. *This is the default for our current standards, but should it be of interest or importance, ASTM has guidelines for establishing precision and bias.*

Appendix A – Commentary

This Commentary is not a part of this standard. It consists of explanatory and supplementary material designed to assist users in complying with the requirements. It is intended to create an understanding of the requirements through brief explanations of the reasoning employed in arriving at these requirements or to provide other clarifications. It therefore has not been processed in accordance with ANSI Essential Requirements and may contain material that has not been subjected to public review or a consensus process. Thus, it does not contain requirements necessary for conformance with the standard.

C4.9 Statistics

Statistical information required for approvals or listings may vary depending on the jurisdictional requirements. It is the responsibility of the program sponsors to determine the appropriate statistics to report.

SPRI
TDP-1 Tear Drop Peel
Wyndham Grand
Clearwater Beach, FL
January 12, 2024
10:15 a.m.

AGENDA

I.	Call to Order	S. Childs
II.	Roll Call & Reading of SPRI Antitrust Statement	
III.	Review Pre-Canvas List	
IV.	Review TDP-1 Standard Draft	
V.	Adjournment	

Task Force Objective:
– Stephen Childs, GAF *start date 10/2023* *budget: $0*

Develop an industry recognized standard that outlines a procedure to evaluate and compare the interactions of membranes, substrates, and membrane adhesives when used to adhere the membrane to the substrate material.

465 Waverley Oaks Road, Suite 421 – Waltham, MA 02452
t. 781.647.7026 f. 781.647-7222 e. info@spri.org

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Voter Name	Answer
Chadwick Collins	General Interest
David Roodvoets	General Interest
Todd Burroughs	General Interest
Michael Giangiacomo	Other Producer
Mike Darsch	Other Producer
Stephanie Kiriazes	Other Producer
Stephen Childs	Other Producer
Christopher Mader	Producer
Al Janni	Producer
Nick Eschhofen	Producer
Steven Moskowitz	Producer
Brian Chamberlain	Producer
Colin Griswold	Producer
Tim McQuillen	Producer
Stan Choiniere	User
David Hawn	User
David Alves*	User
Flonja Shyti	
Linda King	
Chris Meyer	
Mike Ennis	
Luis Cadena	
Andrew Reynolds	
Joel King	
Zach Priest	

*added 10/10/2023 - FM invited to participate

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SPRI
Technical Committee
Wyndham Grand
Clearwater Beach, Florida
January 12, 2024
3:30 p.m.

AGENDA

I.	Call to Order	S. Childs
II.	Roll Call & Reading of SPRI Antitrust Statement	
III.	Minutes: Vote on approval of the minutes of the October 2023 meeting (attached)	
IV.	Review of Completed Objectives	
V.	Task Force Reports	
	a. ADT-1	Eschhofen/Griswold
	b. Code Development	A. Hickman
	c. Codes & Standards	C. Collins
	d. DORA™ Edge Securement	B. LeClare
	e. DORA™ Fire Classification	C. Collins
	f. DORA™ Listing Service	C. Collins
	g. Internal Positive Pressure (no TF meeting)	Childs/Mader
	h. Lightning Protection Vote on the approval of White Paper (attached) Vote on disbanding Task Force	B. Van Dam
	i. PRO Guide Updates (https://www.spri.org/pro-guide-updates/)	C. Collins
	j. PVC Environmental	S. Stanley
	k. RD-1 Standard Update	L. Donovan
	l. Resiliency	M. Ibanez
	m. RP-14 Revision	C. Mader
	n. Standards Library and Template Vote on the approval of Template Document – SPRI Testing Standard (attached)	C. Mader
	o. TDP-1 (Peel Test Procedure)	S. Childs
	p. VR-1 Revision	M. Darsch
	q. Standards date review	C. Collins
VI.	Unfinished Business	
VII.	New Business	
VIII.	Adjournment	

SPRI
Technical Committee
Sheraton Suites at O'Hare
Rosemont, IL
17 October 2023

Minutes

Call to Order

Technical Committee Chair Stephen Childs called the meeting to order at 3:30 p.m. CT. The SPRI Antitrust Statement* was read.

Roll Call

Members present:

Stephen Childs, GAF
Daniel Blasini, Anchor Products, LLC
Brian Chamberlain, Carlisle Construction Materials
Stan Choiniere, StanCConsulting
Gareth Christopher, Siplast
Joan Crowe, GAF
Liam Donovan, OMG Roofing Products
Tanner Duer, Seaman Corporation
Jamie Duvall, GAF
Nick Eschhofen, TruFast
Mike Giangiacomo, Flex Membrane International Corp.
Melissa Grant, DuPont
Frank Greco, IKO Industries Ltd
Colin Griswold, OMG Roofing Products
Marci Guettler, Duro-Last Roofing, Inc.
Tyler Harkness, SFS
David Hawn, Dedicated Roof & Hydro-Solutions
Matthew Hollingsworth, Georgia-Pacific Gypsum LLC
George Howell, Martin Marietta Magnesia Specialties
Al Janni, Duro-Last Roofing, Inc.
Evan Kennard, Duro-Last Roofing, Inc.
Joel King, IB Roof Systems
James Kirby, Siplast
Stephanie Kiriazes, Holcim Building Envelope Division
Mikael Kuronen, Georgia-Pacific Gypsum LLC
Dylan Langer, Tremco Inc
Bob LeClare, ATAS International, Inc.
Chris Mader, Blue Ridge Fiberboard, Inc.
Yuddish Manna, ROCKWOOL
Rick Martelon, Johns Manville Corporation
Brian Martineau, IB Roof Systems
Matthew McGreal, National Gypsum
Walt McIntosh, Holcim Building Envelope Division
Martin Moesgaard, Metal-Era, LLC
Rick Montoya, Acme Cone Company
Steve Moskowitz, Atlas Roofing Corporation
Drew Nehrenz, OMG Roofing Products
Dave Nordentoft, Leister Technologies
Hayden O'Brien, Canadian General Tower Limited
Alpesh Patel, UL LLC
Robert Patton, Carlisle Construction Materials
Steve Peplin, Talan Product Inc.
Brian Randall, National Gypsum

*SPRI Antitrust Statement: SPRI complies with antitrust laws and requires participants in its programs to comply with antitrust laws. Discussions which could affect competitive pricing decisions or other competitive factors are forbidden. There may be no discussions of pricing policies or future prices, production capacity, profit margins or other factors that may tend to influence prices. In discussing technical issues, care should be taken to avoid discussing potential or planned competitive activities. Members and participants should be familiar with the SPRI Antitrust Policy and act in conformity with it.

Bob Reel, H.B. Fuller
David Salo, Duro-Last, LLC
Vince Sandman, Holcim Solutions & Products
Dan Scheerer, SFS Group USA, Inc
Sally Schomp, Plastex Matting
Jordan Scott, Canadian General Tower Limited
Brian Shamas, Anchor Products, LLC
Andrew Shinko, ICP Group
Adam Snyder, Talan Product Inc.
Joel Stanley, Anchor Products, LLC
Shawn Stanley, IB Roof Systems
Jason Tang, Holcim Building Envelope Division
Kim Tokarski, Johns Manville
Brad Van Dam, Metal-Era, LLC
Steve Wadding, Polyglass USA, Inc.
Frederick Walnut, Holcim Polymers Sealants, NA
Dan Wise, Intertek
Nathan Young, Holcim Building Solutions
Theodore Young, GAF
Eric Younkin, Metal-Era, LLC

Staff present:
Chadwick Collins, SPRI
Amanda Hickman, The Hickman Group

Guests present:
Michelle Jones, Creativate

Approval of Previous Meeting Minutes
On a motion duly made, the minutes of the July 2023 Technical Committee meeting were approved as presented with no objections.

Reports & Updates
ADT-1 Task Force Chairs Eschhofen and Griswold reported the following:

- Discussed application concerns related to bead application vs. full application.
- Changes will be drafted for consideration.

Code Development Task Force –Chair Amanda Hickman reported the following:

- Reviewed the ICC process updates
- Reviewed targeted proposals for 2024 for IFC, IPC, and UPC
- Reviewed recent ASHRAE and IECC developments
- Reviewed the update to the Florida Building Code and potential proposals for the next revision cycle for the 9th edition of the FBC

Codes & Standards Task Force Chair Chadwick Collins reported the following:

- Industry association activities for the 3rd quarter with ACC, CRRC, and RICOWI were reported
- Updates related to the Build America Buy America (BABA) Act, PFAS, and US GSA were presented. Collins emphasized his recommendation that member companies evaluate their PFAS use profile
- Activity by multiple entities with ANSI-related work was reviewed, with several items noted for Collins to continue to monitor

Code Compliance Task Force - Task Force Chairs Luis Cadena and Eric Younkin reported the following:

- Did not meet

Digital Content & Communications Task Force Chair Montoya reported the following:

- Reviewed the schedule of blogs (once a month versus other schedules) – will continue with once-a-month
- The blog calendar will be in the shared folder on the website
- Considering a website review for the spring or summer meetings
- Reviewed the first video blog and, with feedback, targeting once a quarter

DORA ™ Edge Securement Task Force Chair Bob LeClare reported the following:

- Discussed how private label and on-site roll form products would be addressed in DORA
- Will try to meet between now and January

DORA ™ Fire Classification Task Group Chair Chadwick Collins reported the following:

- Collins provided an in-depth review of code language, focused on the similarities and differences between how the code addresses wind uplift, impact resistance, and fire classification
- Collins presented the previously suggested possible paths forward, and the group discussed the merits and concerns of each

DORA ™ Listing Service Steering Committee Chair Chadwick Collins reported the following:

- The objectives of the Steering Committee were reviewed
- Dan Wise (Intertek) provided a quarterly summary of the key metrics and performance indicators for DORA
- The feedback and developed scorecard was reviewed

Education Task Force Chair Brian Chamberlain reported the following:

- Review of the pre-wind video; comments supported having that video for the presentation
- Discussed the wind seminar from 16 October 2023 and initial feedback
- 2020-60 attendees; 2021-41 attendees; 2022-48 attendees; 2023-83 attendees
- Discussed University Outreach; only one student signed up but did not show up for the seminar
- Discussed a request for discussion on warranties; discussed that ASCE 7 is used for code compliance, permitting, and occupancy; warranties should be addressed with individual companies for particular requirements

Internal Positive Pressure Task Force Chair Stephen Childs and Chris Mader reported the following:

- Reviewed proposal from Sam Everett for white paper
- With no other proposals, the Task Force will move forward with Everett's proposal (money already approved by the Board)

Lightning Protection Task Force Chair Brad Van Dam reported the following:

- Reviewed two documents published
    - Article in Roofing Elements Magazine (3 pages)
    - Dissecting Code Langauge (8 pages) was picked up and gaining traction
- A proposal from Sam Everett for the white paper was reviewed. The committee voted to ask for money; LPS volunteered to share financial commitment. Ask will be for a maximum of $300. With no objection, the ask will be presented to the Board

Peel Test Procedure Task Force Chair Stephen Childs reported the following:

- Reviewed the timeline, budget, and goals of the task force
- A presented scope was shared, and with no objection, the technical committee will submit the scope to the Board for approval

PRO Guide Updates Task Force Chair Chadwick Collins reported the following:

- A review of the tracking spreadsheet was presented with recent updates highlighted
- Reported that the ES-1 support document review was finished
- Reviewed status of current documents in review

PVC Environmental Joel King reported on behalf of Task Force Chair Shawn Stanley the following:

- Reviewed the draft white paper
    - After discussion, Stanley will go back to the author with feedback to align the paper more in line with the original scope

Resiliency Standard Task Force – Task Force Chair Mario <> reported the following:

- Reviewed the draft definition and related information
- Continue to develop the definition and called for feedback from the larger membership

RP-14 Revision Task Force Chair Chris Mader reported the following:

- Went through a final draft during the task force meeting
- The drawing is being revised, and the standard will be sent out once the revision is complete

Standards Consistency Task Force Chair Chris Mader reported the following:

- Reviewed the draft document based on existing document structures
- Task Force approved the document as it exists for the Technical Committee to consider at a future meeting
- Developing an Excel-based tool for consistent conversions in standards

VR-1 Revision – Technical Committee Chair Childs reported for Task Force Chair Darsch the following:

- Moving to ballot the standard as is
- Looking for a volunteer to carry the standard through the rest of the process, Stephanie Kierakas volunteered
- WD-1 will be under review next year

New Business

- Al Janni reminded members of the open nomination for the SPRI service award and asked for submissions
- Bob Reel thanked the sponsors for the support of this meeting and the upcoming January meeting

Adjournment

There being no further business, the meeting adjourned at 4:06 p.m. CT.

Submitted by: Chadwick Collins, SPRI Technical Director

These minutes have been reviewed by SPRI Legal Counsel.

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WHITE PAPER

LIGHTNING PROTECTION CODE CHANGES UPDATES

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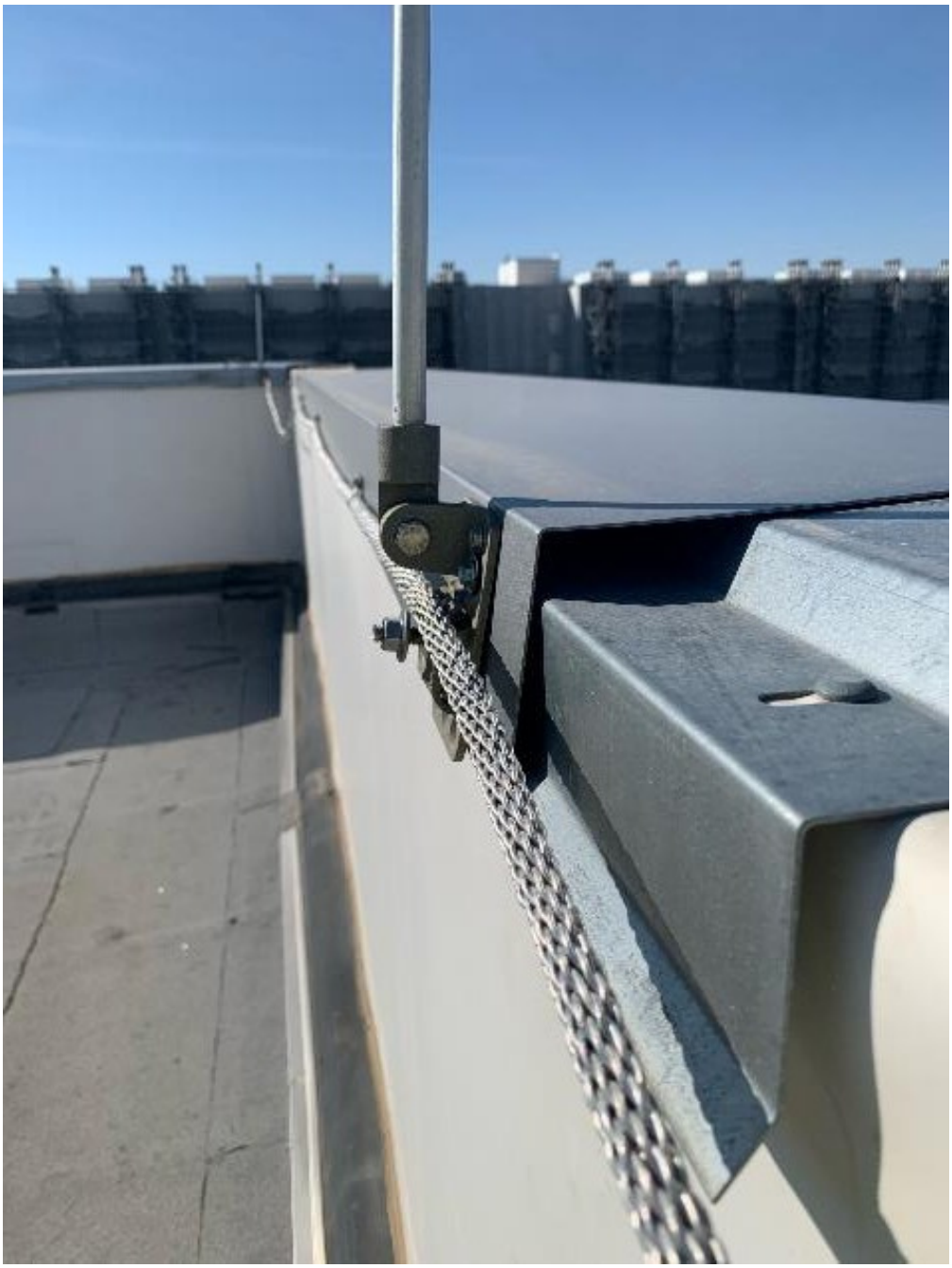
by: SPRI and the Lightning Protection Institute



Published:

LPI LIGHTNING PROTECTION INSTITUTE

SPRI SINGLE PLY ROOFING INDUSTRY

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Table of Contents

Section 1: Introduction

Lightning poses a significant threat to property, and with potentially significant damages. According to the Insurance Information Institute (iii), during the first half of 2023, convective storms caused $38 Billion in insured losses. Beyond physical building damage, lightning poses a threat to electrical and electronic components in a building, to its overall security, and to data collected and stored on site. In fact, the Lightning Protection Institute (LPI) estimates that $1.7 trillion in data was lost in one year alone.

According to National Geographic, a single bolt of lightning can produce anywhere from 100 million to 1 billion volts and contains billions of watts of power. In addition, the energy from lightning heats the air briefly to around 50,000 degrees Fahrenheit according to the National Oceanic and Atmospheric Association.

Across the U.S., many commercial building owners are opting to have a lightning protection system (LPS) installed to help prevent structural damage or loss due to a lightning strike.

"Lightning damage is a reliably preventable issue," said Bret Peifer, president of Mr. Lightning of Colorado Springs, Colorado, independent designers, and installers of lightning protection systems for commercial and residential properties, and LPI board member who participated in the code review process and hearings. "A properly designed, installed, inspected, and certified lightning protection and grounding system can virtually mitigate this risk to policyholders and the public.

Section 2: Lightning Protection Systems and Components

The National Fire Protection Association has developed an ANSI standard -- NFPA 780 -- for lightning protection systems in North America, which have five fundamental components, including:

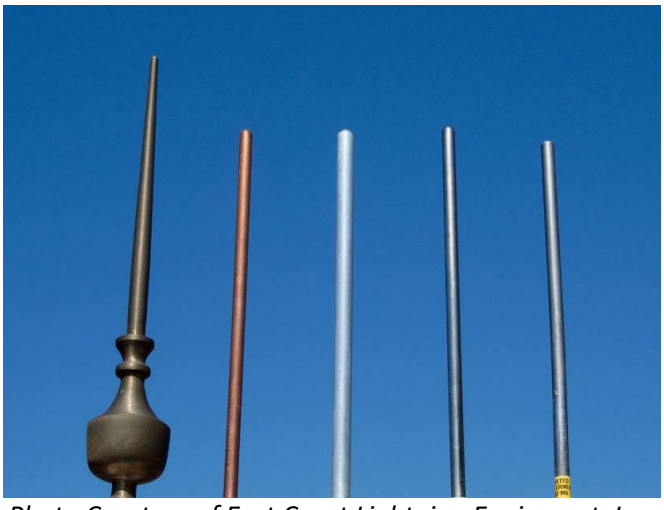

Photo Courtesy of East Coast Lightning Equipment, Inc.

1. Air Terminals or Strike Termination Devices. Commonly referred to as lightning rods, strike termination devices are installed on high points of a structure to intercept lightning before it hits the building, or a building component, and leads the electrical charge to the ground. These devices can be solid, pointed, or blunt tipped, and are typically made of aluminum alloy or copper.

Photo Courtesy of East Coast Lightning Equipment, Inc.

2. Cable Conductors. Heavy-duty metal cables called cable conductors are used to connect the air terminals on the roof to provide a path for the lightning current to follow to the below-grade grounding electrode system. Such cables are often braided, but can be solid, and are typically made of aluminum or copper.

Photo Courtesy of SPRI, Inc.

3. Bonding Connections. Bonding connections are used to connect the LPS to other internally grounded metallic systems on the roof, such as air conditioning units, vent stacks, and other components. The purpose of bonding is to create a path for lightning current and helps to prevent lightning from side-flashing or arching to another metallic systems in the building.
4. Grounding Electrodes. Electrodes are typically 10-foot-long copper-clad steel rods, connected to the cable conductors and driven into the ground at multiple points around the building.
5. Surge-Protection Devices. Wherever power or signal wires enter a building, surge protection devices specifically configured for lightning are installed. These are necessary to stop the intrusion of lightning from utility lines and equalize differences between grounded systems during lightning events.

According to the LPI, it is also critically important that lightning protection systems always be installed, inspected, and certified by a professional trained in installing these systems. Additionally, the installed system should meet the standards outlined in either NFPA 780 Standard for the Installation of Lightning Protection Systems, or UL 96A Installation Requirements for Lightning Protection Systems.

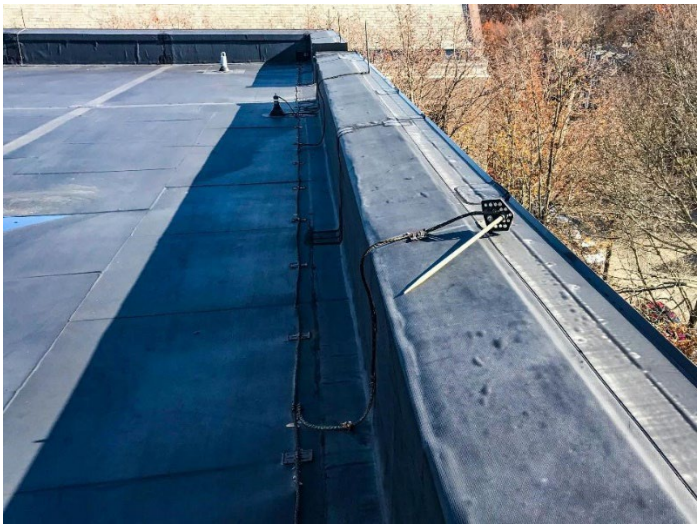

Photo Courtesy of SPRI, Inc.

Section 3: Updated Code Language

The International Building Code (IBC) is updated in multiple phases, based on annual review cycles. In 2021, the Group A Cycle included updates to Chapter 27, which covers 'electrical' issues, including lightning protection systems. During this cycle specific language referencing the industry's two standards commonly used by lightning protection system installers -- NFPA 780 and UL 96A -- was first added to Chapter 27 of the building code. The update requires compliance with either NFPA 780 or UL 96A when lightning protection equipment is installed but does not mandate that lightning protection equipment be installed on commercial buildings.

However, neither the updated language, nor the referenced standards, address how lightning protection systems should be specifically secured to existing roofing components. The addition of this language to the 2024 IBC, led SPRI, Inc., the trade association representing the manufacturers of single-ply roofing systems and the related component materials, to take steps to clarify how LPS components should be secured to edge metal and other tested roofing components. The specific wording added to Section 2703 for the 2024 IBC, under Lightning Protection Systems, reads as follows:

Photo Courtesy of SPRI, Inc.

Section 2703 Lightning Protection Systems

2703.1 General. Where provided, lightning protection systems shall comply with Sections 2703.2 through 2703.3.

2703.2 Installation. Lightning protection systems shall be installed in accordance with NFPA 780 or UL 96A. UL 96A shall not be utilized for buildings used for the production, handling, or storage of ammunition, explosives, flammable liquids, flammable gases, or other explosive ingredients, including dust.

2703.2.1 Surge protection. Where lightning protection systems are installed, surge protective devices shall also be installed in accordance with NFPA 70 and either NFPA 780 or UL 96A, as applicable.

2703.3 Interconnection of systems. All lightning protection systems on a building or structure shall be interconnected in accordance with NFPA 780 or UL 96A, as applicable.

The 118-page NFPA 780 standard, which dates to 1904, has been continuously updated and revised since it was established. According to NFPA, the stated purpose for the standard is to 'provide for the safeguarding of persons and property from hazards arising from exposure to lightning.'

The standard defines and details the components of a lightning protection system, including the material composition, diameter, and cross section area of air terminals, as well as the main conductor cables and bonding conductors. Furthermore, it specifies the height of air terminals, material requirements for air terminals, cables, brackets as well as fasteners. Lastly, the standard provides details for air terminal placement, which varies based on the roof slope and/or design, building height, cable placement, and ground rod installation.

UL has been testing and certifying lightning protection equipment since 1908 and examines lightning protection system components and completed installations for compliance with its standards. The UL 96A standard provides minimum requirements for installation of air terminals, cable conductors, connectors, fittings, and fasteners used in quality lightning protection systems.

Section 4: Roofing Industry Concerns & Current Code Language

"In the language updated by the Group A code development cycle in 2021, NFPA 780 and UL 96A are specifically referenced in Chapter 27 of the building code," said Amanda Hickman, president of The Hickman Group, a code consulting firm based in Plantation, Florida, representing SPRI, Inc. "This is the first time that those two industry standards will be specified in the code. And while detailed in many ways, neither NFPA 780 nor UL 96A, address the impact that attaching lightning protection systems to the roof system may have on the tested components of the roof assembly, including the edge metal, roof membrane, and more."

The perimeter of low slope commercial roofs provides a critical protection point for roofing assemblies relative to wind pressures and water infiltration. The edge metal system is not only a critical component of the roof's design, but it also serves as the roof's first line of defense when it comes to severe weather. Estimates from insurance carriers including FM Global (FM) indicate that the roof's perimeter failures account for nearly 59% of roofing system failures in high wind events. Furthermore, fascia, coping, and gutter edge metal components are required by the building code to be tested to resist specific wind loads. As such, there is a concern in the roofing community that when lightning protection systems are installed, it may alter the wind load or system performance of the edge metal system.

Additionally, the roofing assemblies, which include all components from the roof deck up (i.e., deck, air barrier, insulation, membrane as well as the fasteners or adhesive), are often tested and approved for use through FM. While not a code requirement, FM wind ratings are based on tested roofing assemblies. Any changes to the roof assembly components, e.g., insulation type or thickness, deck type or grade, fasteners, etc., can impact the assemblies' performance, have significant implications for the building owner, and nullify the FM rating. Therefore, adding lightning protection to the roofing system may also impact its FM rating.

Concerns from SPRI members about how lightning system are attached, combined with the two guiding installation standards for LPS – NFPA 780 and UL 96A – being added to the code, prompted SPRI to take action to address this situation and the code update.

The first step was for SPRI to establish a task force to seek and build cooperation between the lightning protection industry and the commercial roofing industry. The goal of the task force was to clarify the code language on how lightning protection systems, when used, should be secured to the roof or perimeter edge metal system without negatively impacting the wind rating or system performance.

The task force held initial discussions and meetings with a variety of key stakeholders, including LPI, UL Solutions, the National Electrical Manufacturers Association (NEMA), and NFPA, who were all interested clarifying the code language, which would come in the Group B code development cycle in 2022.

"It was important to the commercial roofing industry that when lightning protection systems are used, they are installed with guidance from the roofing system and/or the edge system manufacturer, to preserve the building envelope in a wind or weather event," said Hickman. "The roof and edge metal systems are required by code to be tested to ensure that they meet certain performance standards, and therefore it is critical that these components maintain their integrity when lightning protection systems are installed."

As part of the Group B Cycle, which followed the initial discussions, proposed new language was developed and sent to all the organizations with which SPRI had been working. The draft language was also submitted in January 2022, as an update to Chapter 15, 'Rooftop Structures,' which had not been updated in the earlier review cycle.

"The wording added to Chapter 27 in the first phase of the code update, was focused on installing lightning protection, but there was nothing about maintaining or protecting the integrity of the roofing system, which is covered in Chapter 15 of the code and a critical consideration in the process," said Hickman.

Proposed IBC updates go through a series of developmental process steps. The first is a Committee Action Hearing. Approval of a proposed change during a Committee Action Hearing is based on a simple majority vote by a technical committee. Further changes are subject to a Public Comment Hearing in front of the International Code Committee's (ICC) governmental membership. In both steps, testimony, arguments, and opposing viewpoints are verbally presented about the proposed changes. However, once the proposed change reaches the Public Comment Hearing step, revisions to the code then require approval by 2/3rds of the ICC's governmental voting members.

The ICC held a Committee Action Hearing on this topic in Rochester, NY in April 2022. Several from the lightning industry attended the hearing and spoke out against the proposed new language, to the surprise of the SPRI representatives at the meeting. In the end, the ICC technical committee disapproved the proposed language in a resounding 13 to 1 vote.

"We were very surprised by the outcome of that hearing," said Hickman. "We had been working with several people from the lightning industry and believed that everyone was on the same page, perhaps without recognizing the potential negative impact that the new wording would have on their industry. What was immensely clear was that there was a huge gap between what the roofing industry and the lightning protection industry needed to resolve this issue, and that's when the really hard work began."

Section 5: Originally Proposed Language Issues

There were several critical problems with the draft language presented from the lightning protection industry's perspective. Lightning protection must be installed around the outmost perimeter of a structure, according to the UL and NFPA standards, fastened every three-feet, and installed within two-feet of the building's perimeter. This design ensures that the lightning protection system is located on the portions of the structure to which lightning is typically attracted. The updated draft language was in direct conflict with the standards, as noted below:

1. Lightning Rods (strike termination devices) are required to be within two feet of the outside corner. Not allowing the Lightning Protection industry to attach to the coping, would make this impossible. Especially on rooftop objects such as cameras, antennas, or any items that project over the top of the coping and are on the outer edge of the building.

   *NFPA 780 Section 4.7.2.1 states: "As shown in Figure 4.7.2.1, the distance from the strike termination devices to ridge ends on pitched roofs or to edges and outside corners of flat or gently sloping roofs shall not exceed 2 ft." Similar language is provided UL 96A, Section 8.1.5.*2.

2. Lightning Rods are required to be installed around the perimeter at 20-foot intervals. It is not just the corners that this proposal would compromise. Depending on the width of the coping, every lightning rod could be affected.

   NFPA 780 Section 4.7.2.2 states "Strike termination devices shall be placed on ridges or pitched roofs and around the perimeter of flat or gently sloping roofs at intervals not exceeding 20 ft." Similar language is provided UL 96A, Section 8.2.2.1.

3. Lightning Protection conductors are required to be attached every three feet maximum. This creates a problem all to itself. If we, as an industry, fasten to the membrane below the coping, that is a ton of holes in the membrane. If we are forced to use brackets, that is a ton of brackets and it will be problematic to coordinate the exact layout, timing, warranty, etc.

   NFPA 780 Section 4.10 "Conductor Fastener. Conductors shall be fastened to the structure upon which they are placed at intervals not exceeding 3 ft." Similar language is provided UL 96A, Section 9.1.5.

"We were very surprised by the outcome of that hearing," said Hickman. "We had been working with several people from the lightning industry and believed that everyone was on the same page, perhaps without recognizing the potential negative impact that the new wording would have on their industry. What was immensely clear was that there was a huge gap between what the roofing industry and the lightning protection industry needed to resolve this issue, and that's when the really hard work began."

Section 6: Consensus Building

The next step was to develop and submit new language for 'public comment.' During the next several months, SPRI reached out to all the key industry organizations and stakeholders for discussions and meetings about this issue. During that time, they held meetings with representatives from UL Solutions, LPI, the United Lightning Protection Association (ULPA), the Asphalt Roofing Manufacturers Association (ARMA), the National Roofing Contractors Association (NRCA), the National Electrical Manufacturers Association (NEMA), the Roof Coating Manufacturers Association (RCMA), as well as others to build consensus for revising the language from the original proposal.

Eventually, and after several months of meetings and discussions, new language was drafted jointly by SPRI and the lightning protection industry with assistance from UL Solutions, RCMA, NRCA, ARMA, NEMA and others, and submitted for public comment.

ICC Public Comment Hearings were held in Louisville, KY in the Fall of 2022. It was during that meeting that the Public Comment language was approved by 2/3rds of the ICC Governmental Voting Membership and ratified via a subsequent online vote, thereby solidifying the new language which will be published in the 2024 edition. The IBC is due out in the fall of 2023 and will then be ready for adoption by states and jurisdictions across the US and the world.

During the Public Comment Hearing, representatives from National Association of Home Builders (NAHB), the United Lightning Protection Association (ULPA), UL Solutions and others spoke in favor of the modified language, which addressed the earlier concerns of the lightning and home building industries.

Section 7: 2024 Code Language

The new language essentially goes beyond the existing installation standards outlined in UL 96A and in NFPA 780. It clarifies that attaching lightning protection system components to any part of the roofing system or assembly must be completed in accordance with the manufacturer's installation instructions for the roof assembly, roof covering, metal edge systems, or gutter, however it does not impact the placement or spacing of any lightning protection equipment.

The new language stipulates that LPS installations must be completed in accordance with the roofing system or edge metal manufacturer's instructions, or specifications from a qualified design professional. In addition, where LPS components are secured to, or penetrate the roof, they must be properly flashed. The new language, which will be added as new sub-sections in Section 1511 'Rooftop Structures,' reads as follows:

1511.7 Other rooftop structures. *Rooftop structures* not regulated by Sections 1511.2 through 1511.6 shall comply with Sections 1511.7.1 through 1511.7.6, as applicable.

1511.7.6 Lightning Protection Systems. Lightning protection system components shall be installed in accordance with Sections 1511.7.6.1, 1511.7.6.2, and 2703 of this code.

1511.7.6.1 Installation on metal edge systems or gutters. Lightning protection system components attached to ANSI/SPRI/FM 4435/ES-1 or ANSI/SPRI GT-1 tested metal edge systems or gutters shall be installed with compatible brackets, fasteners or adhesives, in accordance with the metal edge systems or gutter manufacturer's installation instructions. Where the metal edge system or gutter manufacturer is unknown, installation shall be as directed by a *registered design professional.*

1511.7.6.2 Installation on roof coverings. Lightning protection system components directly attached to or through the *roof covering* shall be installed in accordance with this chapter and the *roof covering* manufacturer's installation instructions. Flashing shall be installed in accordance with the *roof assembly* manufacturer's installation instructions and Sections 1503.2 and 1507 where the lightning protection system installation results in a penetration through the *roof covering*. When the roof covering manufacturer is unknown, installation shall be as directed by a *registered design professional.*

"This is a significant and important update to the building code," said Hickman. "We worked very hard with both the roofing and lightning protection industries to develop language that everyone could agree on, and we all made compromises and concessions to make this happen. A key part of the revision included language allowing registered design professionals to direct the installation of lightning protection equipment when the roofing or edge system manufacture cannot be identified."

"In the end, working with SPRI, UL and others was critically important for this development. We clearly had different perspectives and business concerns that had to be addressed in the process," said Peifer. "In true consensus building, no one is ever 100% happy with the outcome, and I think that's what happened here. But we worked together to get to wording that everyone can live with."

Protecting the integrity of the building envelope is critical. Lightning installers are not roofing experts, and commercial roofing contractors are not experts in lightning protection installation. For the benefit of the building structure, equipment, occupants, and owner, it is therefore incumbent on the specifier or system manufacturer to clearly document how the roofing and lightning protection systems effectively interface for best performance of both systems.

The IBC is written to benefit building owners, building occupants, and society. Conflicts among the various component providers will always occur and must be addressed and solved by the parties involved. Building consensus is difficult, time consuming, and requires compromise by all entities, for the overall benefit of the building owner and occupants.

Photo Courtesy of Mr. Lightning

The 2024 edition of the IBC has been published and many jurisdictions will begin their adoption of it in 2024. *However, whenever installed, the impact of a lightning protection system on the performance of a roof system should always be considered.* Moving forward, manufacturers of edge metal systems and roofing materials will need to work with the lightning protection industry to provide clear installation instructions for this equipment, in conjunction with the roofing system.

# # #

Section 8: About the authors

Brad Van Dam
President
SPRI, Inc.

Brad Van Dam is the Vice President of Sales for MTL Holdings, the parent company of Metal-Era, Citadel Architectural Products, and Hickman Edge Systems. MTL is the largest manufacturer of commercial coping and fascia systems in North America and with Citadel, provides high quality ACM and MCM wall systems. Brad is currently the President of SPRI, Inc., the trade association representing the manufacturers of single-ply roofing systems and the related component materials. His term as president of SPRI goes through 2024.

Prior to joining Metal-Era, Brad owned and operated for 18 years, a 50-employee contracting firm installing concrete coating and polishing systems throughout the U.S. Brad also serves on the board of two nonprofit organizations, and enjoys coaching youth volleyball at the club level, for which he is celebrating his 30th year of coaching.

Brad attended Southwestern College in Chula Vista, Calif. In addition to SPRI, he is a member of the International Institute of Building Enclosure Consultants (IIBEC), and the Roofing Industry Committee on Weather Issues, Inc. (RICOWI).

Tim Harger
Executive Director,
Lightning Protection Institute

Tim is an industry expert with an entrepreneurial spirit. For over 35 years, he has engaged in all aspects of the lightning protection industry: Manufacturing, Installation, and Inspection. With these diverse experiences, Tim developed a vision of growth for the lightning protection industry that involves high standards, education, and partnerships. Tim's desire to maintain high standards comes from his involvement with ANSI accreditation and the ISO certification processes. Furthermore, he understands the value of partnerships to gain different perspectives and to learn best practices, which can be seen with his involvement in the NFPA 780 Committee and industry associations such as AIA and IIBEC.

Tim holds a BS in Industrial Technology from Iowa State University. He also is a certified LPI Master Installer Designer. He has served as the Executive Director of the Lightning Protection Institute/LPI for just over 2 years and has been the Program Manager for the LPI-IP, which is the industry's 3rd party inspection program, for over 10 years.

Return to Schedule

SPRI
VR-1
Wyndham Grand
Clearwater Beach, Florida
January 12, 2024
11:30 a.m.

AGENDA

I.	Call to Order	M. Darsch
II.	Roll Call & Reading of SPRI Antitrust Statement	
III.	Review ballot results	
IV.	Vote on disbandment	
V.	Adjournment	

Task Force Objective:
Mike Darsch, Sika
start date 10/2022 objectives approved 01/15/23 budget: $0

This SPRI/ANSI VR-1 Procedure for Investigating Resistance to Root or Rhizome Penetration on Vegetative Roofs standard will be reviewed, edited if necessary, and canvassed for re-approval as an American National Standard. This review is required every 5 years per ANSI Essential Requirements.

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Item #1 - Should the VR-1 document be reaffirmed as an American National Standard?				
ITEM No.	SENT	RETURNED	%RETURNED	
1	10	8	80.00%	
Affirmative Comment optional	Negative w/ Comment	Abstain with or without Comment		
8	0	0		
100.00%	0.00%	0.00%		
Votes:				
Voter Name	Voter Role	Answer	Section	Comment
David Hawn	Official Voter	Affirmative Comment optional	6.3.1	In a successful test the entire growth media mass will be completely bound together by roots or rhizomes and will come out of the test trial container as a single mass. Root or rhizome density at the bottom of the test containers shall be evaluated when the boxes are "dissembled". Do you mean instead "disassembled"
David Hawn	Official Voter	Affirmative Comment optional	6.2	Editorial: If "in the course of" the test evaluations... could be replaced with If "during" the test evaluations"
David Hawn	Official Voter	Affirmative Comment optional	6.1	Editorial: "detect for" is awkward consider "observe" / "inspect for" / "detect signs of" A formal evaluation of the transparent base of the 6 test trial containers shall be conducted in intervals of 6 months to "detect for" visible roots or rhizomes penetration.
David Hawn	Official Voter	Affirmative Comment optional	5.4	Editorial: (e.g., "acrylic glass")? Figure 3 states "Plexiglas" -- Why not use the same term? 5.4Trial Containers ... Trial containers shall be fitted with transparent bases (e.g., acrylic glass) so that root or rhizome penetration can be detected even during the test phase without interfering with the growth media. (Figure 3) ...
Mike Ennis	Official Voter	Affirmative Comment optional		
Phillip Smith	Official Voter	Affirmative Comment optional		
Christopher Mader	Official Voter	Affirmative Comment optional		I thought the task force was going to solicit feedback on other vegetation options to include as appropriate for the standard due to the lack of availability of the current grasses that are given in VR-1. I would be concerned about the use-ability
Mike Darsch	Official Voter	Affirmative Comment optional		
Stephanie Kiriazes	Official Voter	Affirmative Comment optional		
Rick Martelon	Official Voter	Affirmative Comment optional		
T.W. Freeman	Official Voter	Affirmative Comment optional	# 13 VR1	Affirmative vote by T.W. Freeman
Linda King	Administrator			
Angie Durhman	Official Voter			
Ryan VanWert	Pending			
Tim Winegar	Official Voter			