Roofing & Building Enclosure Council of Sheet Metal, Air, Rail and Transportation
May 16, 2023
Hilton Garden Inn – Memphis, TX

ES-1 (and GT-1) perimeter edge metal certification

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ANSI/SPRI/FM 4435/ES-1 2017
Test Standard for Edge Systems Used with Low Slope Roofing Systems
Approved January 24, 2017
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Disclaimer
This standard is for use by architects, engineers, roofing contractors, manufacturers, testing agencies, and owners of low slope roofing systems. SPRI, its members and employees do not warrant that this standards is proper and applicable under all conditions.
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ANSI/SPRI/FM 4435/ES-1, "Test Standard for Edge Systems Used with Low Slope Roofing Systems"

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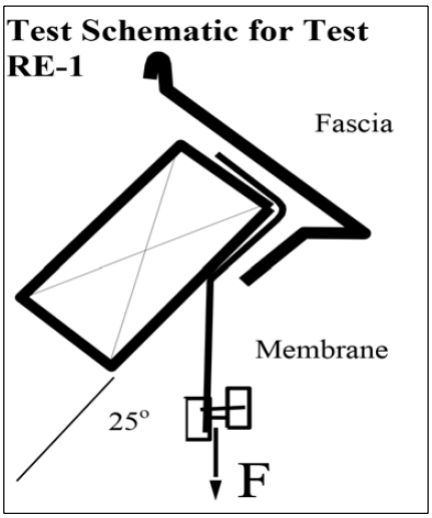

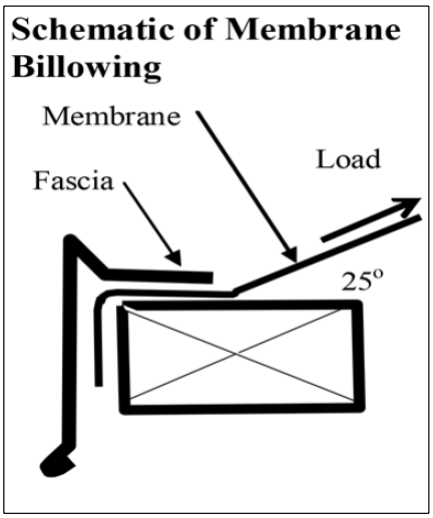

Test RE-1

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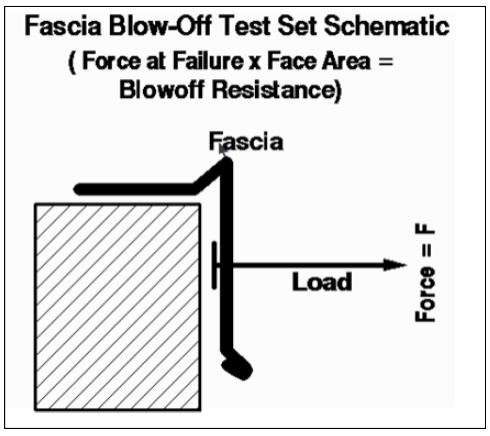

Test RE-2

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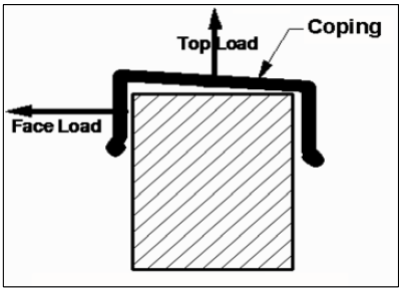

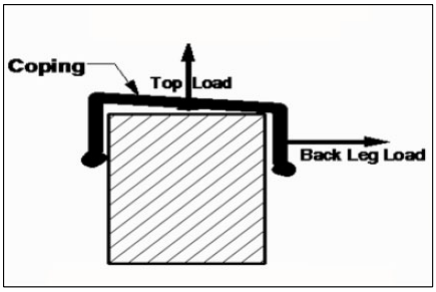

Test RE-3

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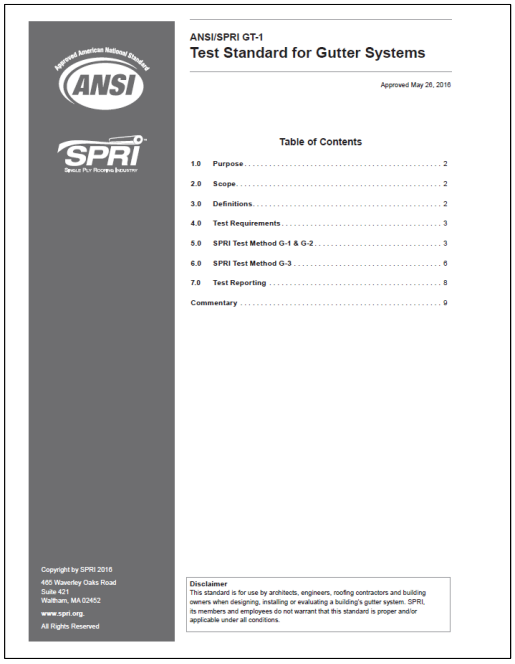

ANSI/SPRI GT-1
Test Standard for Gutter Systems

Approved May 26, 2016

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Disclaimer
This standard is for use by architects, engineers, roofing contractors and building owners when designing, installing or evaluating a building's gutter system. SPRI, its members and employees do not warrant that this standard is proper and/or applicable under all conditions.

ANSI/SPRI GT-1, "Test Standard for Gutter Systems

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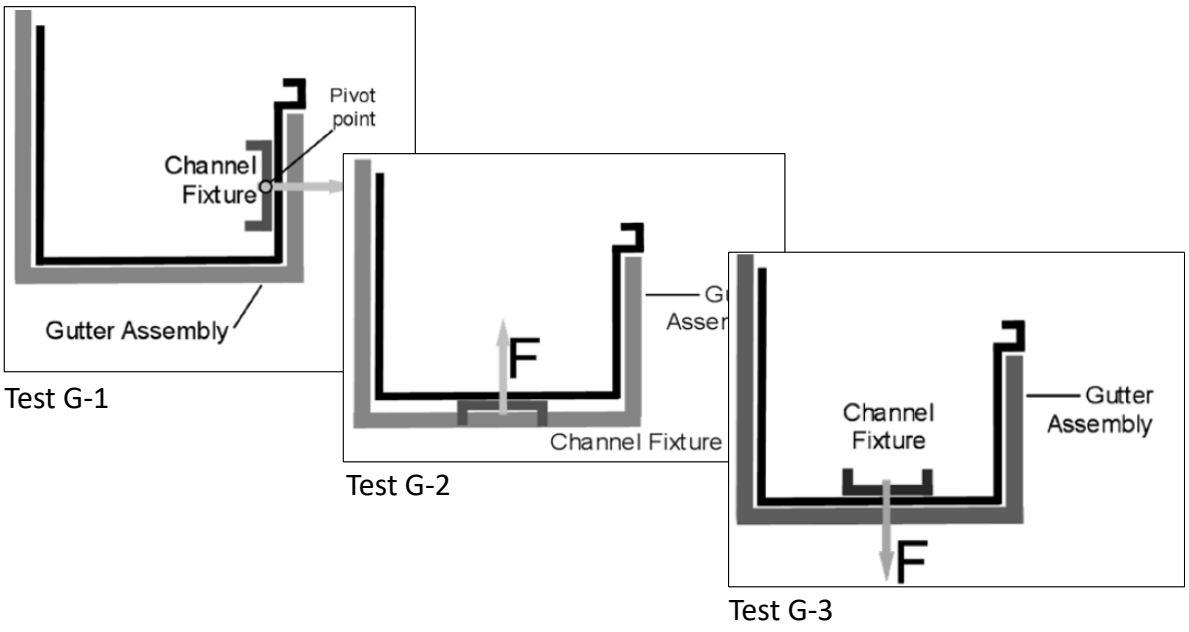

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ES-1 and GT-1 provide resistance loads

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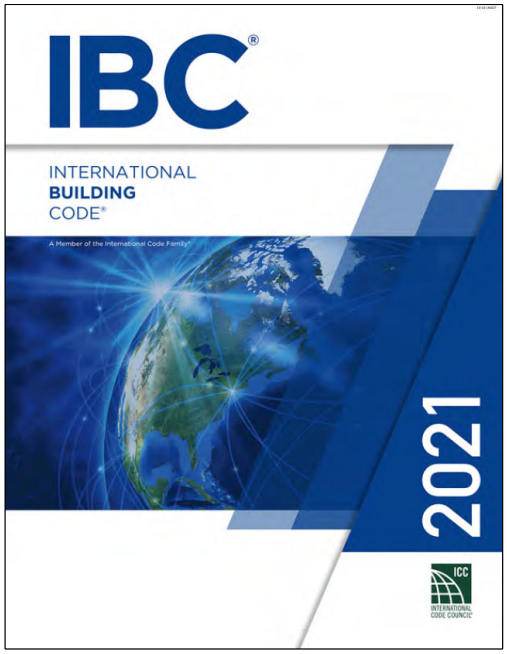

International Building Code, 2021 Edition

Link

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ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

1504.5 Ballasted low-slope single-ply roof systems. Ballasted low-slope (roof slope < 2:12) single-ply roof *coverings* that are subject to cyclical flexural response due to wind *loads* shall not demonstrate any significant loss of

1504.6 Edge systems for low-slope roofs. Metal edge systems, except gutters and counterflashing, installed on built-up, modified bitumen and single-ply roof systems having a slope less than 2 units vertical in 12 units horizontal (2:12) shall be designed and installed for wind *loads* in accordance with Chapter 16 and tested for resistance in accordance with Test Methods RE-1, RE-2 and RE-3 of ANSI/SPRI ES-1, except basic design *wind speed*, V, shall be determined from Figures 1609.3(1) through 1609.3(12) as applicable.

1504.6.1 Gutter securement for low-slope roofs. Gutters that are used to secure the perimeter edge of the roof membrane on low-slope (less than 2:12 slope) built-up, modified bitumen, and single-ply roofs, shall be designed, constructed and installed to resist wind loads in accordance with Section 1609 and shall be tested in accordance with Test Methods G-1 and G-2 of SPRI GT-1.

d. For Exposure D, add 8 inches (203 mm) to the parapet height required for Exposure C and the parapet height shall not be less than 12 inches (305 mm).

2021 INTERNATIONAL BUILDING CODE® 15-3

INTERNATIONAL CODE COUNCIL

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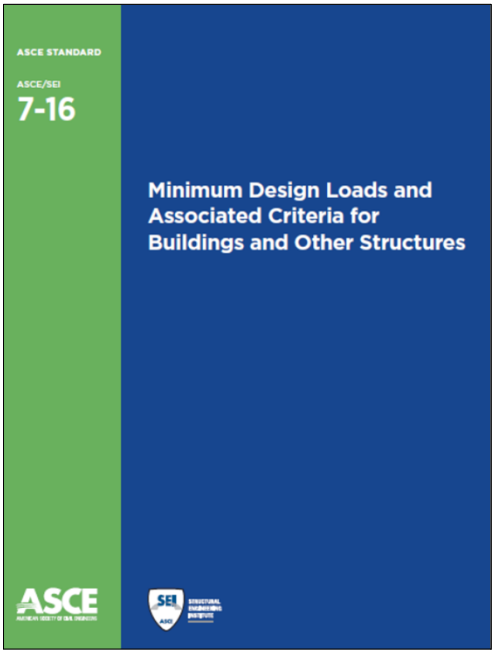

American Society of Civil Engineers Standard 7, "Minimum design loads and associated criteria for buildings and other structures" (ASCE 7-16)

Link

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ASCE 7-16 provides design wind loads

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roofwinddesigner.com

ASCE 7-05, ASCE 7-10 and ASCE 7-16

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Roof Wind Designer is intended to provide users with an easy-to-use means for determining roof systems' design wind loads for many commonly encountered building types that are subject to building code compliance.

Design-wind loads are derived using the American Society of Civil Engineers (ASCE) Standard ASCE 7, "Minimum Design Loads for Buildings and Other Structures." This standard is a widely recognized consensus standard and is referenced in and serves as the technical basis for wind load determination in the International Building Code and NFPA 5000: Building Construction and Safety Code. Roof Wind Designer allows users to choose between ASCE 7's 2005, 2010, and 2016 editions. Roof Wind Designer uses ASCE 7-05's Method 1—Simplified Method, ASCE 7-10's Envelope Procedure, Part 2: Low-rise Buildings (Simplified) of Chapter 30, ASCE 7-16's Envelope Procedure, Part 2: Low-rise Buildings (Simplified) of Chapter 30, and Part 4: Buildings with 60ft < h ≤ 160ft (Simplified). For a more detailed explanation of ASCE 7's three editions, please click here.

Also, Roof Wind Designer determines roof systems' minimum recommended design wind-resistance loads, which are derived from the building's design wind loads, taking into consideration a safety factor in reliance of ASTM D6630, "Standard Guide for Low Slope Insulated Roof Membrane Assembly Performance," AISI S100, "North American Specification for the Design of Cold-formed Steel Structural Members" and AA ADM1, "Aluminum Design Manual: Part 1-A—Specification for Aluminum Structures, Allowable Stress Design; and Part 1-B—Aluminum Structures, Load and Resistance Factor Design." Using these minimum recommended design wind-resistance loads, users can select appropriate wind resistance classified roof systems.

Edge-metal flashing systems take into consideration a safety factor in reliance of ANSI/SPRI ES-1 "Test Standard for Edge Systems Used with Low Slope Roofing Systems."

Roof Wind Designer has been developed and is maintained by the National Roofing Contractors Association (NRCA), with initial support of the Midwest Roofing Contractors Association (MRCA) and the North/East Roofing Contractors Association (NERCA). The application is currently available at no cost.

Questions regarding Roof Wind Designer can be directed to the Contact Us page.

To register for a new account click here. If you already have an account, click here to login.

NRCA
National Roofing Contractors Association

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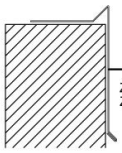
roofwinddesigner.com

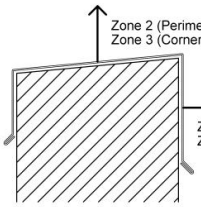
RE-1 tests an edge metal system's ability to restrain a membrane force from billowing. This test method is only applicable to ballasted and mechanically attached membrane systems that do not contain a "peel stop" within 12 inches of the roof edge. RE-1 is not applicable to adhered roof membranes.



Zone 4 (Perimeter) = 41.8 pounds per square foot
Zone 5 (Corners) = 51.7 pounds per square foot

RE-2, "Test Method for Dependently or Independently Terminated Roof Membrane Systems."

RE-2 tests resistances to horizontal (outward from building face) loads for gravel stops or fascias.



Zone 2 (Perimeter) = 81.1 pounds per square foot
Zone 3 (Corners) = 110.4 pounds per square foot

Zone 4 (Perimeter) = 41.8 pounds per square foot
Zone 5 (Corners) = 51.7 pounds per square foot

RE-3, "Test for Copings."

misinformation, miscalculations, mistakes or changes that have been input into this application may affect the results, accuracy, reliability and

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Fundamental concept

Tested resistance ≥ Design loads

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NRCA's ES-1 (and GT-1) testing and certifications

- NRCA has tested various fascia, gravel stop, coping and gutters
  - Accredited testing laboratory
- NRCA has obtained third-party certifications for compliance
  - UL Solutions
  - Intertek Testing Services, N.A.

UL and Intertek are recognized, code-approved testing and certification agencies

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Steps to certification

- Execute NRCA's Authorized Fabricator Agreement
- Initial "factory" inspection
  - Orientation process
  - Verify capability
- Fabricate and install as tested

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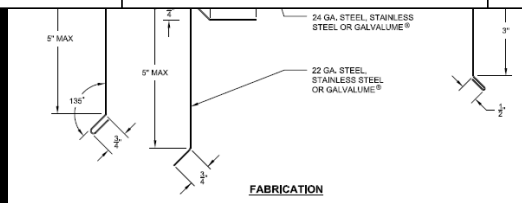
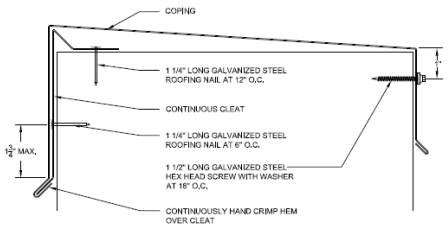
THE NRCA ROOFING MANUAL CONSTRUCTION DETAIL C-3 NRCA UL ES-1 CERTIFICATION	COPING • 24 GA. STEEL • 24 GA. STAINLESS STEEL • 24 GA. GALVALUME®	ANSI/SPRI ES-1 TESTED RESISTANCE OUTWARD: 214 LBS./SQ. FT. UPWARD: 350 LBS./SQ. FT.



FABRICATION



INSTALLATION

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Steps to certification

- Execute NRCA's Authorized Fabricator Agreement
- Initial "factory" inspection
  - Orientation
  - Verify capability
- Fabricate and install as tested
- Product labeling (NRCA-provided labels)
- Periodic factory "audits"
  - Verify production documentation… document label usage
  - Material verification… verify mill certificates

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What's the cost…

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Why use the NRCA program?

- It's already established
- Testing costs spread over multiple users
- Certification costs spread over multiple users
- Use of NRCA brand… and UL or Intertek brand

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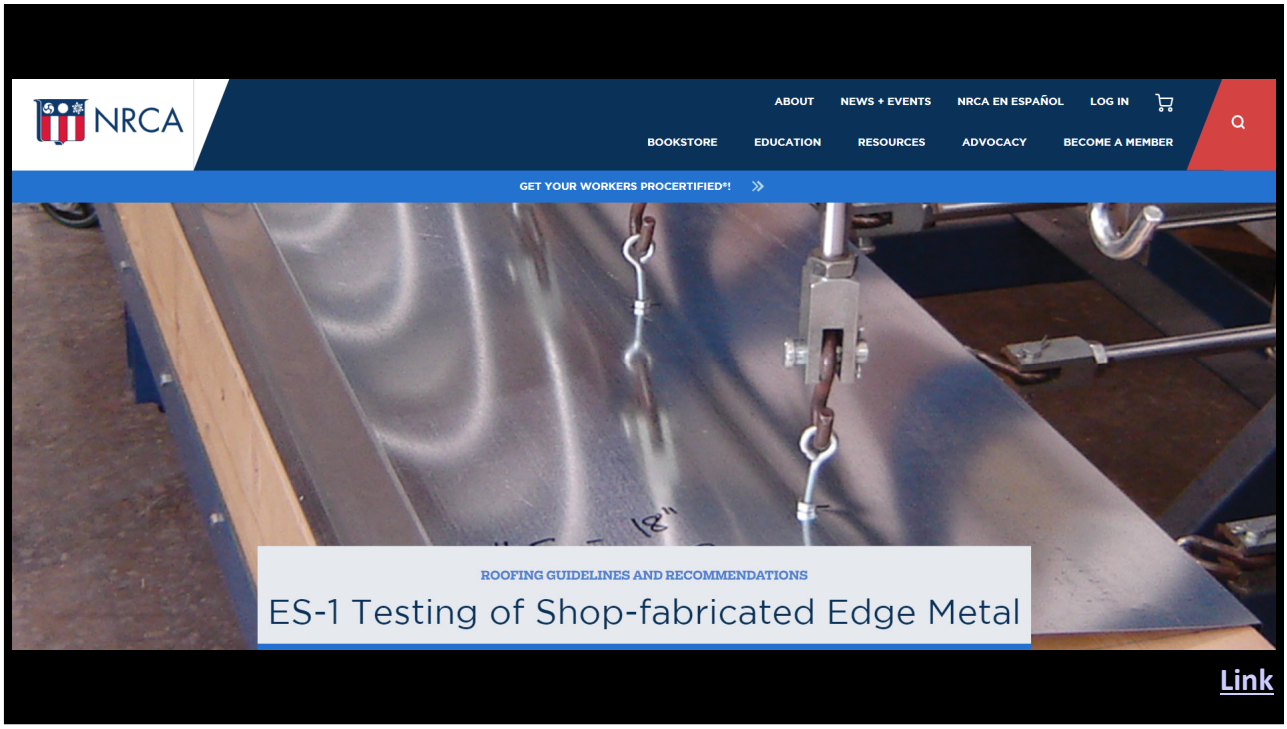

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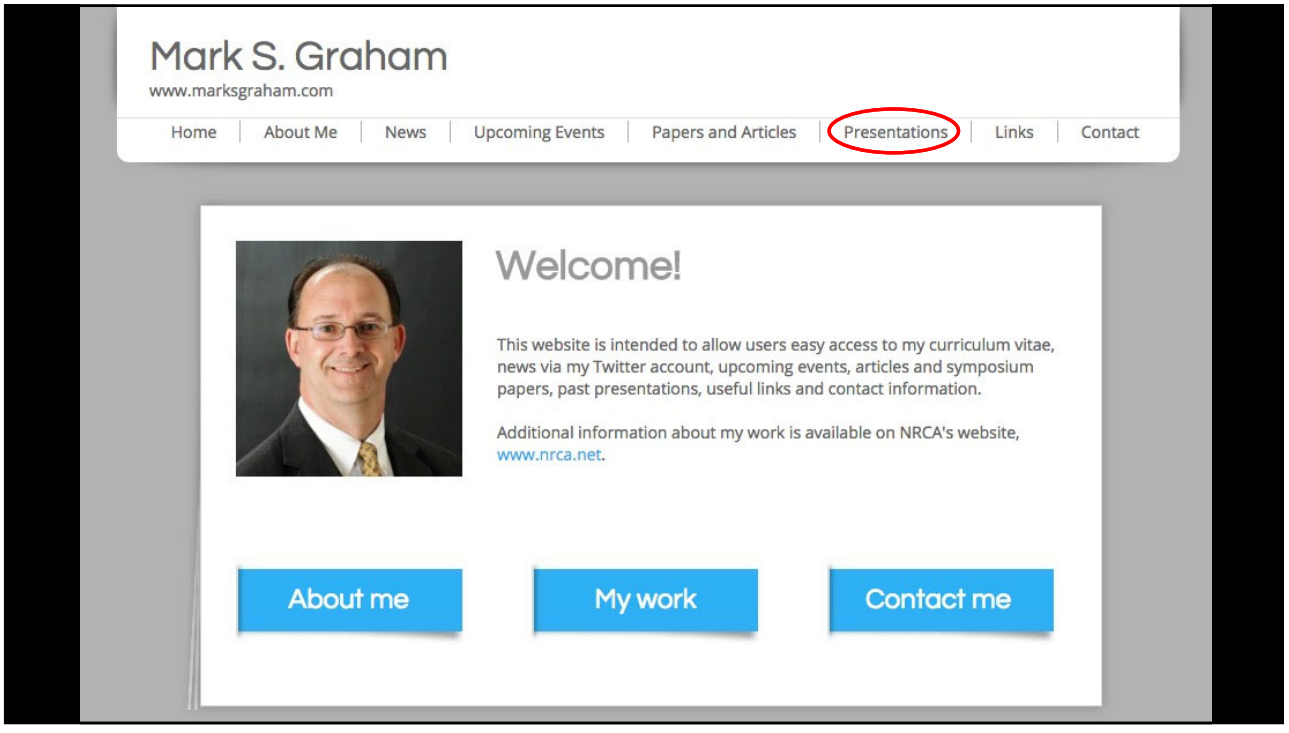

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