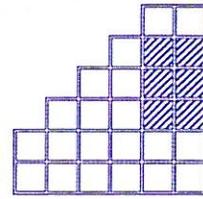


# French Engineering, Inc.

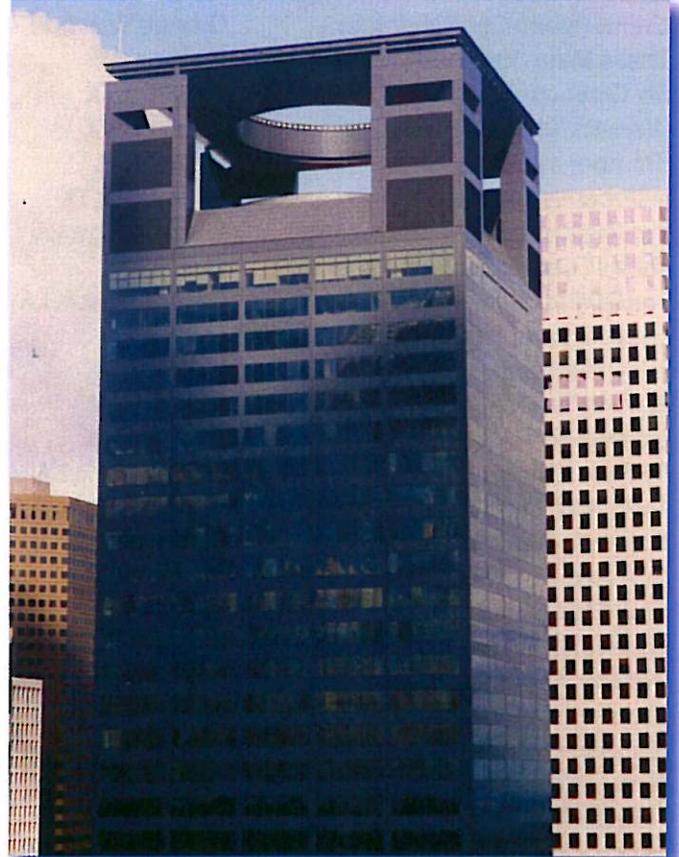
4201 FM 1960 Rd. West, Suite 300  
Houston, TX 77068 - 3498  
(281) 440-8284 FAX: (281) 440-8286  
TOLL FREE: 1 (800) 395-8285



[www.frenchengineering.com](http://www.frenchengineering.com)

## SERVICES

- Building Condition Surveys
- Building Diagnostics
- Forensic Studies
- Performance Investigations
- Constructibility Analysis
- New Construction Design
- Design Peer Reviews
  - Division 7
  - Division 8
- Plans & Specifications
- Contract Administration
- Construction Inspections
- Construction Testing
- Expert Testimony
- Roof Moisture Surveys
  - Infrared Thermography
  - Nuclear Moisture Meter

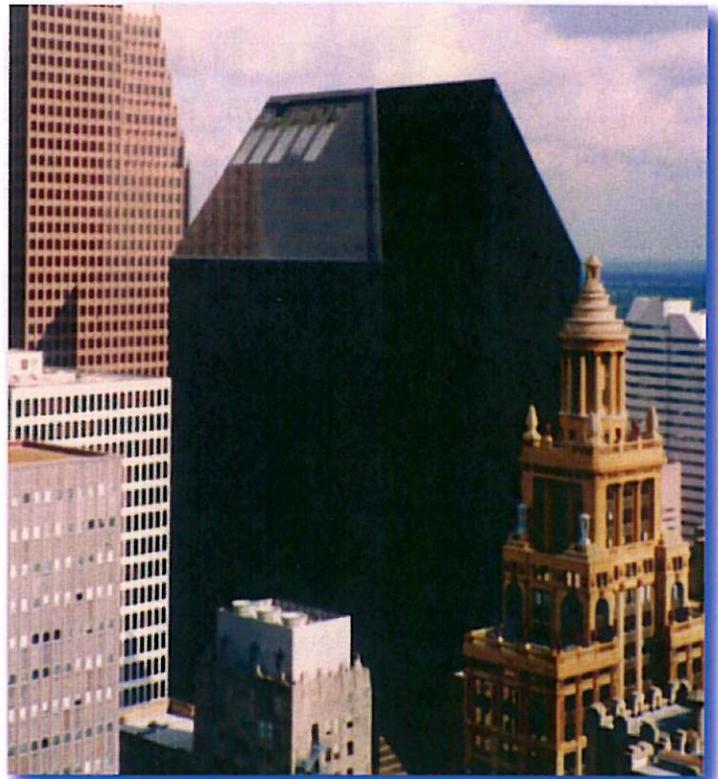


## SPECIALTIES

- Built-Up Roofing
- Single-Ply Roofing
- Metal Roofing
- Sheet Metal Design
- Window Performance Analysis
- Curtain Wall Designs
- Building Sealants
- Brick & Masonry
- Precast Concrete
- Plaster & EIFS
- Below Grade Waterproofing
- Plaza Deck Waterproofing
- Concrete Investigation & Repair
- Moisture Problem Analysis

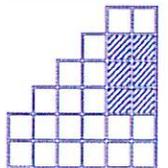
# PARTIAL PROJECT LIST

Argosy Sheraton Hotel	Baton Rouge, LA
Case Library/Colgate University	Hamilton, NY
Hilton Village-Kalia Tower	Honolulu, HI
One Shell Plaza	Houston, TX
Lambeth House Assisted Living	New Orleans, LA
Grand Pointe Condominium	Orange Beach, FL
Thalia Mara Auditorium	Jackson, MS
Six Greenspoint Plaza	Houston, TX
Warwick Towers Terrace Deck	Houston, TX
Belmont at Park Central	Orlando, FL
Wimberley High School	Wimberley, TX
Southgate Towers Apartments	Baton Rouge, LA
Dallas Theological Seminary	Dallas, TX
Tradewinds Condominium	Orange Beach, LA
Cypress Bend Resort & Conf. Center	Many, LA
1400 Hermann Building	Houston, TX
Skyline Towers	St. Paul, MN
ExxonMobil-Upstream Research	Houston, TX
1750 St. Charles Apartments	New Orleans, LA
John A. Wilson Building	Washington, D.C.
Colorado Mills-Super Mall	Lakewood, CO
Concord Mills-Super Mall	Charlotte, NC
Katy Mills-Super Mall	Katy, TX
Opry Mills-Super Mall	Nashville, TN
Phoenix Tower Office Building	Houston, TX
Novotel Hotel/Manhattan	New York, NY
Acapulco Princess Hotel	Acapulco, Mexico
New Orleans Hilton Hotel	New Orleans, LA
FBI Headquarters Building	New Orleans, LA
Holiday Inn/Memphis East	East Memphis, TN
Baylor University/Moody Library	Waco, TX



## French Engineering, Inc.

FORENSIC STUDIES • CONSULTING • TESTING  
ROOFING • WATERPROOFING • CURTAIN WALLS



### Houston Contacts:

**Warren R. French, P.E., RRC, RWC, CCS**

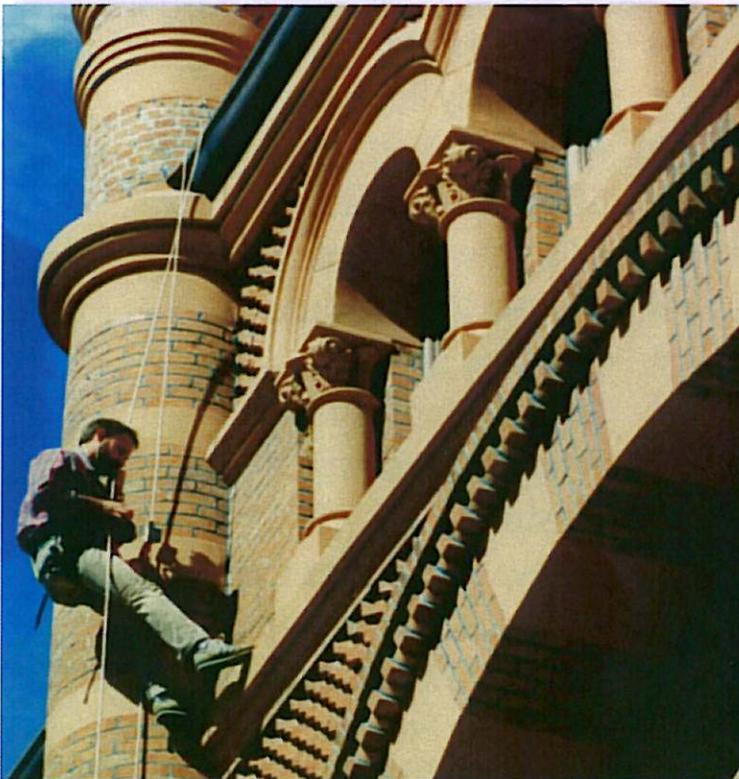
4201 FM 1960 Rd. West, Suite 300  
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**(281) 440-8284**

**(800) 395-8285**

**FAX: (281) 440-8286**

**Website: [www.frenchengineering.com](http://www.frenchengineering.com)**



### ASSOCIATIONS

- American Society of Civil Engineers (ASCE)
- Roof Consultants Institute (RCI)
  - Registered Roof Consultant
  - Registered Waterproofing Consultant
- Construction Specifications Institute (CSI)
  - Certified Construction Specifier
- International Concrete Repair Institute (ICRI)
- American Society for Testing & Material (ASTM)
- Infrappection Institute

Curriculum Vitae for:

**Warren R. French, P.E., RRC, RWC, REWC, GRP, CEI, CCS, FRCI**

President

www.frenchengineering.com

**FRENCH ENGINEERING, LLC**  
4201 FM 1960 West, Suite 300  
Houston, Texas 77068  
(281) 440-8284 / (281) 440-8286 FAX

**PROFESSIONAL PROFILE:**

a) Registered Professional Engineer in the following jurisdictions:

State of Texas	State of Virginia	State of New York
State of Florida	State of Kansas	State of Tennessee
State of Georgia	District of Columbia	State of Mississippi
State of Minnesota	State of North Carolina	State of Louisiana
State of Alabama	State of Pennsylvania	State of New Jersey
State of South Carolina	State of Wisconsin	State of Oklahoma

b) Certified Construction Specifier (CCS) and professional member of the *Construction Specifications Institute (CSI)*

c) Registered Roof Consultant (RRC #005), and Registered Waterproofing Consultant (RWC #012), and Registered Exterior Wall Consultant (REWC #008), Registered Building Envelope Consultant (RBEC), and professional member of RCI, Inc. (formerly the *Roof Consultants Institute*); Fellow of RCI, Inc. (formerly the Roof Consultants Institute) (FRCI) - 2002 to present:

- 1) 1997 National Treasurer
- 2) 1998 National Secretary
- 3) 1999 National 2<sup>nd</sup> Vice President
- 4) 2000 National 1<sup>st</sup> Vice President
- 5) 2001 National President
- 6) 1997 thru 2005 - Board of Directors
- 7) Chairman of Registration Committee (2002 – present);
- 8) Chairman of Advocacy and Legislation Committee (1998 – 2005)

d) Accredited Green Roof Professional (GRP) and member of *Green Roofs for Healthy Cities (GRHC)*

e) *Association of the Wall and Ceiling Industries-International (AWCI)*:

- 1) Professional Member
- 2) Certified EIFS Inspector (CEI) - #480604

f) Certified Level I and Level III Thermographer (#6688) by *The Infrascpection Institute*

g) *Roofing Industry Committee on Weather Issues (RICOWI)*:

- 1) Member of specially-trained Wind Event Investigation Program (WIP) working under the Department of Energy (DOE) and Oak Ridge National Laboratory (ORNL) to assess wind damage to buildings caused by Hurricane Charley (August 2004) and by Hurricane Ike (September 2008).

h) Certified Trainer for WUFI-ORNL® software for dynamic hygrothermal modeling of building envelopes; certified by Oak Ridge National Laboratory (October 2012-present).

**PROFESSIONAL PROFILE:** (cont'd.)

j) Member of the following organizations:

- 1) *American Society of Civil Engineers (ASCE)*
  - Architectural Engineering Institute - Founding Member
  - Structural Division Task Committee on Performance of Structures
  - Technical Council on Forensic Engineering
- 2) *American Society for Testing and Materials (ASTM)*
  - Committee C-24 on Building Seals and Sealants
  - Committee D-08 on Roofing and Waterproofing
  - Committee E-06 on Performance of Building Construction
  - Chairman - EIFS Task Group E06.58.03 on Structural and Wind Load Testing (1998 to 2008)
    - Committee responsible for ASTM E2134 (Feb. '01)
    - Committee responsible for ASTM E2359 (Jun. '06)
- 3) *Post-Tensioning Institute (PTI)*
- 4) *International Concrete Repair Institute (ICRI)* – Professional Member
- 5) *American Association for Wind Engineering (AAWE)*
- 6) *Sealant, Waterproofing & Restoration Institute (SWRI)* – Associate Member

**EXPERIENCE:**

Thirty-nine years experience in design, engineering and construction of commercial, residential, industrial, and institutional buildings for both domestic and international projects. Special experience and abilities in the analysis, design, testing and inspection of all types of construction assemblies intended to resist wind loads and moisture migration within buildings. Areas of expertise include all types of roofing systems, below-grade and plaza-type waterproofing, building envelopes, building sealants, wall cladding systems, plaster, EIFS, all types of curtain wall, as well as concrete investigation and repair.

**EMPLOYMENT:**

- a) 1990 to Present - French Engineering, LLC - President/Founder  
(formerly French Engineering, Inc.)  
Houston, Texas
- b) 1984 to 1990 - Moisture Systems, Inc. - Vice President/Engineering  
Houston, Texas
- c) 1983 to 1984 - Aquatonics, Inc.  
Houston, Texas
- d) 1981 to 1983 - Fish Engineering & Construction Company  
Houston, Texas
- e) 1974 to 1981 - Armco, Inc. - Western Steel Division  
Houston, Texas
- f) 1973 to 1974 - Brown and Root, Inc.  
Houston, Texas

**EDUCATION:**

- a) 1976 to 1989 - University of Houston  
(part time) Cullen College of Civil Engineering  
Bachelor of Science/Civil Engineering (B.S.C.E.)
- b) 1971 to 1973 - Texas A&M University  
College Station, Texas  
School of Architecture and Environmental Design
- c) Roofing Industry Educational Institute (RIEI)
- d) World of Concrete/World of Masonry
  - 1) Certified Concrete Repair Specialist - 2000
  - 2) Certified Masonry Repair Specialist - 2001
- e) “Sick Building Syndrome & Mold” - August 22, 2000  
Houston, Texas (sponsored by BioSafety Institute)
- f) Light Steel Framing & the Structural Engineer - Part I - November 1, 2002  
Houston, Texas (The Steel Network)
- g) “Mold: A Balanced Approach” – May 11, 2004  
Houston, Texas (sponsored by the Roof Consultants Institute)
- h) “Structural Condition Assessment of Buildings” – September 23 & 24, 2004  
Houston, Texas (sponsored by American Society of Civil Engineers)
- i) “Steel Design After College” – November 2, 2005  
Houston, Texas (sponsored by American Institute of Steel Construction, Inc.)
- j) “Mold in Commercial Buildings” – December 8, 2005 (webinar)  
Houston, Texas (sponsored by American Society of Civil Engineers)
- k) “ACI/PCA 318-05 Building Code” – December 9, 2005  
Houston, Texas (sponsored by American Concrete Institute)
- l) “Designing with Wood: The Basics” – August 7, 2006  
Houston, Texas (sponsored by Auburn University – Engineering Professional Development Program)
- m) “Symposium on Repair, Retrofit and Inspection of Building Exterior Wall Systems (presenter) –  
October 21 & 22, 2006, Atlanta, Georgia (sponsored by American Society for Testing and Materials)
- n) “Façade Attachments to Steel Frames” – December 12, 2007  
Houston, Texas (sponsored by American Institute of Steel Construction, Inc.)
- o) “Design of Wood-Framed Sloped Roofs” – August 16, 2008  
Houston, Texas (sponsored by American Society of Civil Engineers)

**EDUCATION:** (cont'd.)

- p) "Renovation of Wood Trusses" – August 26, 2008 (webinar)  
Houston, Texas (sponsored by American Society of Civil Engineers)
- q) Numerous Other Seminars, Symposiums, and Convention Meetings  
(both as attendee, and as presenter or instructor)

**SPEAKING ENGAGEMENTS:**

- a) Speaker at "National Building Envelope Symposium" in Plano, Texas (Dallas) in April, 1992.
- b) Speaker at Chicago Chapter of the *American Institute of Architects* - Technical Round Table in September, 1992.
- c) Panelist for 1996 CSI Roofing Symposium held in Denver, Colorado, June, 1996 by the Construction Specifications Institute. Reference November, 1996 *The Construction Specifier*, Vol. 49, No. 11.
- d) Speaker at a number of the "Building Envelope Symposiums" sponsored by RCI, Inc. (formerly the *Roof Consultants Institute*):
  - 1) Raleigh, North Carolina - February, 1994
  - 2) Atlanta, Georgia - October, 1994
  - 3) Ontario, California - September, 1995
  - 4) Memphis, Tennessee - September, 1996
  - 5) Seattle, Washington - November, 1996
  - 6) Dallas, Texas - October, 1997
  - 7) San Diego, California - November, 1997
  - 8) Houston, Texas - August, 1998
  - 9) Chicago, Illinois - September, 1998
  - 10) Parsippany, New Jersey - October, 1999
  - 11) Atlanta, Georgia - January, 2000
  - 12) Seattle, Washington - October, 2000
  - 13) Region 6 Hawaii Winter Workshop - January, 2003
- e) Speaker at a number of in-house seminars for major corporations, design firms and associations, including Hilton Hotels Corporation, Marriott Corporation, HKS Architects, Hermes & Reed Architects, Roof Consultants Institute, Southwestern Brick Institute, Associated General Contractors, Building Owners & Managers Association (BOMA)-Dallas Chapter, International Concrete Repair Institute (ICRI), Roofing Industry Committee on Weather Issues (RICOWI), Trammel-Crow Residential, The Morgan Group, C. E. Woodward, etc.

**AWARDS:**

- a) *RCI, Inc.* – 21<sup>st</sup> International Convention and Trade Show
  - 2006 First Place - Large Roofing/Waterproofing Project  
Warwick Towers – Terrace Renovation, Houston, TX
- b) *2003 International Award of Excellence in Rehab and Restoration*
  - Design and Construction - Honorable Mention, Pat Neff Hall, Waco, Texas
- c) *International Concrete Repair Institute (ICRI)*
  - 1996 Award of Excellence - Mid-Rise Project of the Year  
- Downtown Post Office, Houston, TX
  - 1996 Award of Excellence - High-Rise Project of the Year  
- Pinnacle Port Condominium, Panama City Beach, FL

## **PUBLICATIONS AND TECHNICAL PAPERS:**

- a) French, Warren R., “**In-situ Testing of the Structural Integrity of Exterior Insulation and Finish Systems,**” Water in Exterior Building Walls: Problems and Solutions, ASTM STP 1107, Thomas A. Schwartz, Ed., American Society of Testing and Materials, Philadelphia, 1991.
- b) French, Warren R., “**The Practical Use and Potential Limitations of Exterior Insulation and Finish System Materials as an Exterior Building Envelope,**” Water in Exterior Building Walls: Problems and Solutions, ASTM STP 1107, Thomas A. Schwartz, Ed., American Society of Testing and Materials, Philadelphia, 1991.
- c) French, Warren R., “**Recommendations for Remedial and Preventative Actions for Existing Commercial, Institutional, and High-Rise Buildings,**” Moisture Control in Buildings, ASTM Manual Series: MNL 18, Heinz R. Trechsel, Ed., American Society of Testing and Materials, Philadelphia, 1994, Chapter 20, pp. 371-394.
- d) French, Warren R., “**Water Vapor Diffusion and Techniques for Evaluating Vapor Flow Using Vapor Pressure Graphs,**” Development, Use, and Performance of Exterior Insulation and Finish Systems (EIFS), ASTM STP 1187, Mark F. Williams and Richard G. Lampo, Eds., American Society for Testing and Materials, Philadelphia, 1995.
- e) French, Warren R., “**Design and Renovation of a High-Rise Retrofit EIFS Cladding: A Case Study,**” Water Problems in Building Exterior Walls: Evaluation, Prevention, and Repair, ASTM STP 1352, Boyd, Jon M., Ed., American Society for Testing and Materials, 1997.
- f) French, Warren R., “**A Field Performance of Single-Ply, Chlorinated Polyethylene (CPE) Roof Membranes,**” Roofing Research and Standards Development: 4<sup>th</sup> Volume, ASTM STP 1349, T. J. Wallace and W. J. Rossiter, Jr., Eds., American Society for Testing and Materials, 1998.
- g) French, Warren R., “**Post-Installation Field Evaluation of a Pressure-Equalized Single-Ply Roofing System to Determine Drying Effects on a Moist Cementitious Roof Deck,**” Proceedings of the RCI 14<sup>th</sup> International Convention and Trade Show, March 12-16, 1999, Charlotte, NC, Roof Consultants Institute, Raleigh, NC, 1999.
- h) French, Warren R., “**Post-Installation Field Evaluation of a Pressure-Equalized Single-Ply Roofing System to Determine Drying Effects on a Moist Cementitious Roof Deck,**” *RCI Interface*, Aug. '99, Vol. XVII, No. 8, (REPRINT).
- i) French, Warren R., “**Design and Renovation of a High-Rise Retrofit EIFS Cladding: A Case Study,**” *RCI Interface*, Nov. '00, Vol. XVIII, No. 11, (REPRINT).
- j) French, Warren R., “**Legislative & Regulatory Issues for Roof Consultants,**” *RCI Interface*, Apr. '02, Vol. XX, No. 4.
- k) French, Warren R., “**President’s Message,**” Monthly column in *RCI Interface*, from June, 2001 through May, 2002.

**PUBLICATIONS AND TECHNICAL PAPERS:** (cont'd.)

- l) French, Warren R., “**Three Case Studies: Moisture Control in a Hot, Humid Climate,**” Proceedings of the Thirteenth Symposium on Improving Building Systems in Hot and Humid Climates, May 20-23, 2002, Houston, Texas, Jeff Harbel, Technical Director, Energy Systems Laboratory, Texas A&M University, College Station, Texas.
- m) French, Warren R., “**Gulf Coast Syndrome,**” *Home Energy*, May/June 2003, Vol. 20.3, pp. 42-44.
- n) French, Warren R., “**Further Evaluation of Pressure-Equalized Single-Ply Roofing System to Determine Drying Effects on a Moist Cementitious Roof Deck; A Follow-up Study,**” *RCI Interface*, Volume XXI, No. 9, September, 2003, pg. 5-12 [reference Items g) & h), above].
- o) French, Warren R., and Schroeder, Joshua S., “**Case Study: Wind Damage to Commercial Building from Hurricane Charley,**” Proceedings of the Tenth Americas Conference on Wind Engineering (10ACWE), convened by the *American Association for Wind Engineering*, May 31 – June 4, 2005, Baton Rouge, Louisiana.
- p) French, Warren R., and Schroeder, Joshua S., “**Delayed Ettringite Formation (DEF) Within Pre-Cast Concrete Cladding Panels on a Mid-Rise Commercial Office Building: A Case Study,**” *Journal of ASTM International*, Vol. 5, No. 10, 2008, Paper ID JAI100881, available online at [www.astm.org](http://www.astm.org).
- q) French, Warren R., “**Renovation Design and Construction Issues Related to Aluminum Sliding Glass Doors for Residential Mid-Rise Buildings in a Coastal Environment,**” Proceedings of The Future is in the Balance: Symposium on Building Envelope Sustainability, convened by *The RCI Foundation*, April 30 – May 1, 2009, Washington, D.C.
- r) French, Warren R., “**Case Studies of Roofing and Cladding Failures Involving Internal Pressurization,**” Forensic Engineering 2009, Proceedings of the Fifth Congress on Forensic Engineering, convened by the *Technical Council on Forensic Engineering of the American Society of Civil Engineers (ASCE)*, November 11-14, 2009, Washington, D.C.
- s) French, Warren R., “**Evaluation and Remediation of the Building Envelope for Existing High-Rise Buildings,**” Moisture Control in Buildings: The Key Factor in Mold Prevention – 2<sup>nd</sup> Edition; MNL 18-2<sup>nd</sup>, Heinz R. Trechsel and Mark T. Bloomberg, Editors, ASTM International, West Conshohocken, PA, 2009, Chapter 20, pp. 399-427.
- t) French, Warren R., “**Case Studies of Roofing and Cladding Failures Involving Internal Pressurization, and Topographic Effects,**” Proceedings of the 26<sup>th</sup> RCI International Convention and Trade Show, April 7-12, 2011, Reno, Nevada, RCI, Inc., Raleigh, NC, pp. 115-124.