RIA®
Restoration Industry Association

CERTIFIED RESTORER

BODY OF KNOWLEDGE

The complete guide for those pursuing excellence in restoration education and training.

CR
Certified Restorer
Granted by the Restoration Industry Association

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Chicago, Illinois

INTRODUCTION

Left to Right: Don Bragonier, Bob Carrier, Marty King, Reed Dow, Jim Barrett, Major Lee. Murry Dow not pictured.

Forward

In 1978, RIA launched its inaugural advanced training course-of-study and examination in the emerging art and science of fire and smoke disaster restoration. In 1980, seven candidates had the distinction of being inducted into the Association's first group of "Certified Restorers (CR)."

They were the first of many who desired to expand their knowledge beyond the day's current professional development offerings and entered the CR advanced certification program, first completing the specialized course of study, and then pursuing the additional requirements, which included a certification exam and completion of a Formal Report.

Today, the **RIA Certified Restorer** is proudly at the forefront of his or her craft, leading and managing the complex issues and intricacies of restoration projects where their expertise, experience, and advanced knowledge is required and recognized.

Long considered the "Master's Degree of Restoration," training for the Certified Restorer is structured to raise restorers to a higher level of professional ability in all manner of fire and smoke damage repair, while also encompassing water damage, mold remediation, and contents damage, among other areas of specialization.

One cannot mention damage and disaster restoration without acknowledging the major contributions of the individual who had the vision to create the field, giving form and function to fire and smoke damage restoration - Martin King, CR. As the Association's CR Certification Founder and primary CR Instructor for 30 years, the late Martin King (known to all as "Marty") created the fundamental core of the CR educational content, the CR examination, and the CR formal report procedures.

Through RIA's Certified Restorer certification program, literally four generations of professionals were mentored and taught, imbued with the DNA unique to a Certified Restorer: a sense of loyalty, trust, integrity, and professionalism, and a desire to research and "figure it out," – all qualities essential in one who calls himself or herself a Certified Restorer.

It is to the 21st Century Certified Restorer and the restoration industry-at-large, that this CR Body of Knowledge is dedicated.

Introduction

The restoration profession has grown rapidly over the past four decades – with more and more public and private organizations requiring the services of qualified restoration contractors and specifically, the training and expertise of Certified Restorers. Solid knowledge of professional restoration procedures, combined with a growing understanding of the science associated with restoration methods, have moved the profession to a higher profile with the public and private sector, insurance companies, government agencies, and humanitarian groups.

As awareness of the restoration industry increases, an obligation to the end users is recognized by the restoration industry and its affiliated organizations. The restoration profession has expanded from its early years of hands-on field and carpet cleaning training to today's need for consistently updated, expanded, and specific knowledge of fire and smoke damage restoration, water damage restoration, mold remediation, and personal property restoration. This awareness has accelerated the need for uniform restoration education across the country.

The 21st Century Certified Restorer requires an updated comprehensive education, based on a realistic analysis of the expanding restoration industry, and the competencies needed to keep pace with changes is the dynamics of business, finance, operations, and technical procedures. Uniformity in an expanding body of knowledge and the development of corresponding educational programs had to be created to graduate Certified Restorers who are educated in a wide range of knowledge domains and practices.

INTRODUCTION

To offer this standardized basis for restoration education and professionalism among Certified Restorers, in 2011, RIA's Board of Directors approved the formation of the CR Body of Knowledge Committee. For six years, encompassing over 12,000 volunteer hours and staff time, the CR Body of Knowledge Committee engaged in a formal process to define what a 21st Century Certified Restorer needs to know upon graduation, essentially redefining the CR and restoration profession, creating competencies in the CR education, while remaining true to the tenets that guided the creation of the Certified Restorer in the 1980s.

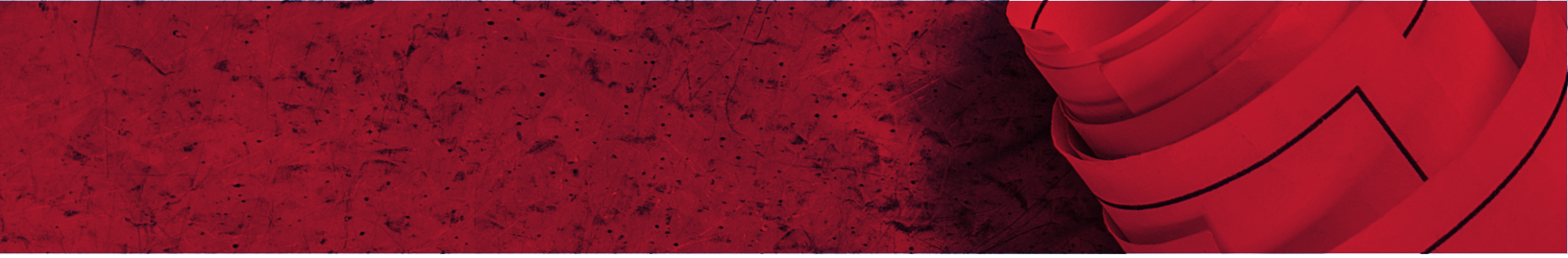
Special Thanks

In May 2011, RIA engaged the services of Coats Knudsen & Associates of Raleigh, North Carolina, a curriculum design and development consulting firm. RIA, via an open application and review process, selected and appointed a nine-member Committee for the CR Body of Knowledge Education project, with each member representing distinct segments of the restoration profession.

Special recognition must be given to RIA's CR Body of Knowledge Development Committee for its tireless efforts over a six-year period to create, manage and deliver this first-ever guiding document of its kind to the restoration industry. Considered a "living document," RIA's Certified Restorer Body of Knowledge will be the basis for the creation of many new educational offerings for the industry, in addition to being the reference point for the creation of the Certified Restorer examination and other new educational programs.

CR Redevelopment Committee Members included:

Peer Reviewers	Accreditation	Company	State
Tom Barr	CR	*Platinum Restoration*	*Illinois*
Scott Black	R, WLS, CMP	*Interstate Restoration*	*Michigan*
Charles Cassani	CR	*Restoration Management Company*	*California*
Lisa Dickson	CR	*Dayspring Restoration, Inc.*	*Montana*
Randy Rapp, D. Mgt	PE, CCE	*Purdue University*	*Indiana*
John Rybski	CR	*Belfor-Ann Arbor*	*Michigan*
Chris Silliman	CR	*First Restoration Services of Asheville LLC (DKI)*	*North Carolina*
Sandi Taylor	CR	*Rainbow International*	*Maryland*
Jack White	CR, WLS	*Rainbow International*	*Texas*



RIA CR Body of Knowledge Peer Reviewers

The CR Redevelopment Committee was guided by Larue Coats, PhD, a certified specialist in the curriculum development field, Cynthia Hereth, RIA's Director of Training and Certification, and Pete Consigli, CR, WLS, RIA Industry Advisor.

Peer Reviewers	Accreditation	Company	State
Daniel Bernazzani	CR	*Liberty Consulting*	*Massachusetts*
Pete Consigli	CR, WLS	*Industry Advisor/Consultant*	*Florida*
John Capponni	CR	*Big Business Impact Group*	*Florida*
Graham Dick	CR, CMP	*Genesis Restorations Ltd.*	*Canada*
Michael Duke	CR	*Utah Disaster Kleenup*	*Utah*
Darren Foote	CR, WLS	*Belfor*	*Nevada*
Norris Gearhart	CR	*TOMI*	*Maryland*
Joseph Goetz	CR, WLS	*Brouwer Brothers Steamatic*	*Illinois*
Jason Hawk	CR	*ServiceMaster of Greater Pittsburgh*	*Pennsylvania*
Jeff Heyd	PhD	*Concrobium*	*California*
Marty King	ASA, CR	*Industry Advisor*	*Virginia*
Bill Lakin	CR	*WJL Associates*	*England*
Ken Larsen	CR, WLS	*Advisor/Instructor*	*Florida*
Cheryl Lewis	CR	*First General Services*	*Pennsylvania*
Michael Pinto	CSP, CMP	*WonderMakers*	*Michigan*
Daniel Sadeh	CR	*Home Design Contents Restoration*	*California*
Mark Savinsky	CR	*Har-Bro*	*California*
Shawn Silliman	CR, WLS	*First Restoration Services of Asheville*	*North Carolina*
Mark Springer	CR	*Dayspring Restoration*	*Montana*
Jason Thornburn	CR	*On Side Restoration*	*Canada*
Steve Willis	CR	*Steamatic*	*California*
Lori Young	CR	*Bartwood Construction*	*California*

Additional recognition is given to those who Peer Reviewed this document prior to publication. Their efforts created a stronger document that will be able to "withstand the assault" of time.

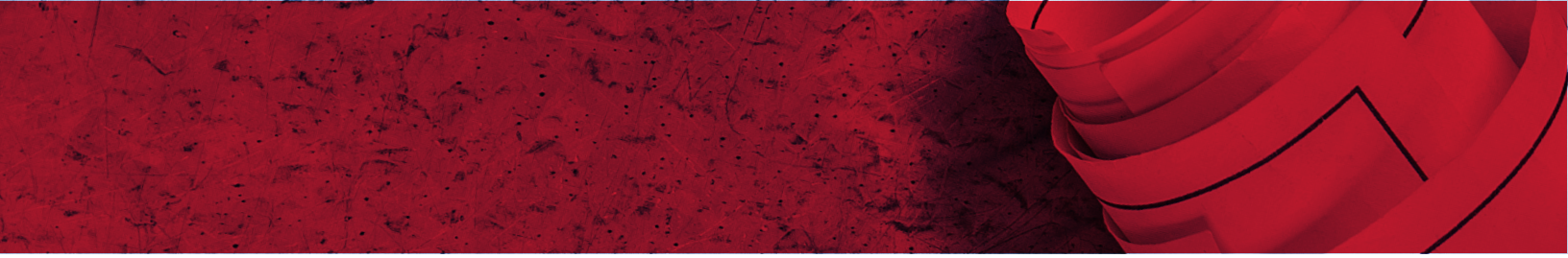
RIA CR BoK Development: Industry Peer Reviewers

IICRC Reviewers	Company or Affiliation
Ed Jones	*Vice President of Education and R&D, HSG-Code Blue, IICRC Chairman of the Board*
Patrick Moffett	*Blue Sky Environmental, Inc.*
Pete Duncanson	*IICRC Chairman of the Board*
Mili Washington, CStd	*IICRC Standards Director*
Randy Rapp, D. Mgt, PE, CCP	*IICRC Education Committee Chair, contact person for IICRC*

IAQA Reviewers	
John Lapotaire	*CIEC, IAQA Board Treasurer, IAQA Education Committee Chair*
Larry Hibbs	*Principle Contractor and Owner of Servpro, IAQA Education Committee Member*
John Kudach	*CIE, CMR, IAQA Education Committee Member*
Donald Weekes	*CIH, CSP, FAIHA™, Immediate Past President IAQA Board of Directors*
Ron Young	*Founder of The Jardy Group, CIEC, CIES, CETC, IAQA Education Committee Member*

AIHA Reviewers	
Ralph A. Froehlich, CIH, CSP, QEP, FAIHA™	*Helix Environmental, Inc.*
Michelle McIntyre, MPH, CIH, CSP	*American Management Resources Corporation (AMRC)*
Robert W. Storment, CIH, CHMM	*Partner, SRP Environmental LLC*
Lindsay Cook CIH, CSP	*Senior Vice President, The EI Group, Inc.*
Mary Ann Latko CAE, CIH, CSP, QEP, FAIHA™	*American Industrial Hygiene Association (AIHA)*
Stacy Calhoun PMP	*American Industrial Hygiene Association (AIHA)* (contact person for AIHA)

Restoration Sciences Academy (RSA)	
Kevin Fisher, WLS	*Former RSA Education & Curriculum Manager*
Brandon Burton, WLS	*IICRC Instructor* (Contact for RSA)



Developing the CR BoK

The CR Redevelopment Committee, with the assistance of Dr. Coats and Cynthia Hereth, analyzed and conceptualized the restoration profession to a high level of detail, and the governing CR BoK System on page 6 was developed. This System outlines interacting elements and knowledge of the restoration educational process, and the profession of restoration is broadly represented in the System. Using this System, the CR Restoration BoK was generated, according to guiding principles of cognitive learning theory in an instructional design framework. The CR BoK document has undergone extensive revisions in addition to an unbiased peer review by a 25 – member Peer Review Team and an extensive open industry peer review process and comment period.

The CR/BoK document is arranged according to the introductory Curriculum System, consisting of four primary "arms:" Leadership Knowledge, Technical Knowledge, Scientific Knowledge, and Management Knowledge. These arms are, in turn, comprised of numerous knowledge areas on which the competencies are based. These knowledge areas are presented in a systematic manner, consistent with the educational learning flow within the restoration profession. Each of the four knowledge categories are further delineated by levels of understanding which have been categorized by the terms mastery, working knowledge, and familiarity.

Definitions, diagrams, formulas, descriptions, methods and competencies are covered comprehensively. The BoK document also conveys how elements of the restoration profession are interrelated to enable Certified Restorers to help clients with the vast array of issues and needs that follow any restoration job, and to provide requisite knowledge in order to accomplish the delivery of the end product, which is either a residential or commercial structure or its contents, appropriately restored to pre-loss condition.

PURDUE UNIVERSITY®

The Purdue Study

The CR Bok Development Committee extensively referenced and discussed the findings from Purdue University's published study on the restoration industry, which surveyed 275 professionals from RIA member firms – including 160 RIA certified respondents. The Purdue Study's mathematically derived results confirmed and underscored the correctness of the BoK, particularly in the Technical Knowledge and Project Management Arms, and captured what actually is needed by the consummate restoration professional, the Certified Restorer.

Curriculum Usage: General Information

To aid future course curriculum developers and Subject Matter Expert Item Writers, the following definitions for the Levels of Knowledge were used and applied to each entry within the document. Throughout the document, font and color changes indicate levels of knowledge as follows:

Mastery. Without reference material, promptly and correctly apply subject knowledge and skills to solve typical problems or address detailed issues in the subject.

Working knowledge. With proper reference material, promptly and correctly apply subject knowledge and skills to solve typical problems or address detailed issues in the subject.

Familiarity. Comprehend industry-specific terminology and general relationships among activities or processes pertaining to the subject, without promptly and correctly applying knowledge and skills to solve typical problems or address detailed issues in the subject, even with proper reference material.

The RIA CR BoK was intentionally created using and referencing the U.S. Imperial Standard. This decision was intended for use by the U.S. Certification SME Exam Item Writers and Curriculum Developers. Future endeavors will include reviews to include metric calculations and standards from countries outside the U.S.

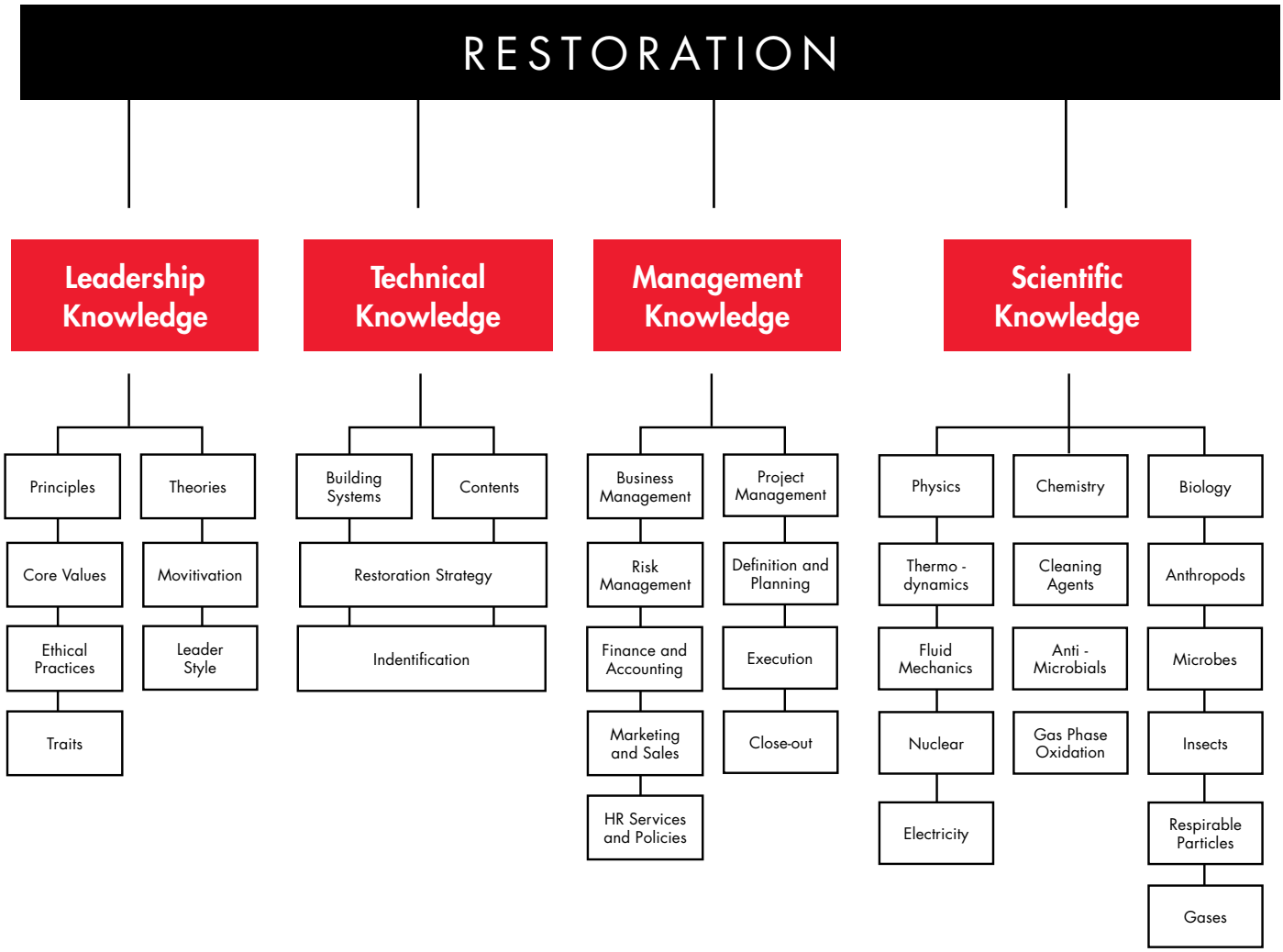
RIA and its Board of Directors, with the CR Redevelopment Committee take pride in offering this CR BOK with accompanying competencies and references to any education entity, teaching institution, or private training company that wishes to educate and train individuals in the art and science of restoration and those who wish to become a Certified Restorer.

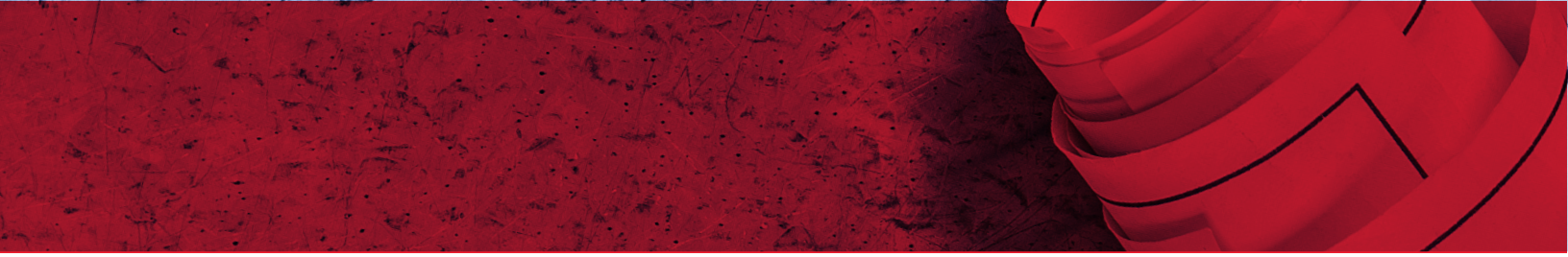
Learning institutions, training experts, education providers, and insurance agencies who wish to use the CR BOK can obtain a Usage Agreement form directly from RIA. By signature, the User agrees to acknowledge RIA in any material which utilizes this Document, in whole or part.

RESTORATION AS DEFINED FOR THE PURPOSES OF THE CERTIFIED RESTORER BODY OF KNOWLEDGE / CURRICULUM:

The mitigation and repair of property damage resulting from natural and man-made disasters.

LEADERSHIP KNOWLEDGE





Leadership Knowledge

Principles

- Core values
  - ☐ Integrity
  - ☐ Compassion
  - ☐ Trustworthiness
  - ☐ Commitment
  - ☐ Confidence
  - ☐ Candor
  - ☐ Humility
  - ☐ Moral courage
- Ethical practices
  - ☐ □RIA ethical codes
- Traits
  - ☐ Communicating effectively
  - ☐ Technical and managerial competence
  - ☐ Leading by example
  - ☐ Developing subordinates
  - ☐ Perseverance
  - ☐ Knowing yourself
  - ☐ Displaying self-control
  - ☐ Selfless service

Theories

- Motivation
  - ☐ Maslow's Hierarchy
  - ☐ Herzberg's Motivation-Hygiene Theory
  - ☐ Fiedler Contingency Model
- Leader style
  - ☐ Situational
  - ☐ Team
  - ☐ Facilitative
  - ☐ Teacher/coach
  - ☐ Charismatic

APPENDIX A: Leadership Arm: References

The following statement pertains to the thought process and rationale when creating the CR Leadership arm content:

- Our leadership values and industry ethics are the basis of why Certified Restorers do what they do.
- Traits are Certified Restorers personal assets that embody the way each of them tends to approachtheir duties.
- Motivational theories help Certified Restorers understand what compels other people in the team tobehave as they do.
- Leadership styles are how Certified Restorers blend their traits with the team's motivational needs to best bring about the desired results.

FM 6-22 and other references were consulted for ideas of what to think about and discuss with regard to CR leadership traits and values—a starting point to help recall experience and structure the knowledge. The FM reference was probably the most influential of the many references reviewed. It is broad in its coverage of leadership issues. It is a consensus document, so it favors no one or few people's personal biases. It is in the public domain and readily available at no cost to professionals. While its purpose is application for military situations, there is much that pertains to leaders of all organizations, no matter what uniform or non-uniform clothing they may wear. The reader need only look beyond some of the military terminology to see the broader implications for leaders of all types and in all organizations.

The list of traits and values are not meant to cover every possible item that a restoration professional might wish to exhibit or internalize, but it covers in large measure the personal qualities and ideals that the CR Redevelopment Committee discussed extensively and deemed essential to include. The Redevelopment Committee decided to keep the lists manageable, so each list comprises only eight entries. Also, the items on both lists were confirmed to be reasonable for inclusion by objective research of restoration professionals.

The motivation theories are commonly discussed in psychology and organizational psychology courses.

From the personal traits and values, and with understanding of common motivational theories, the professional restorer should be able to learn to adapt her or his style to the people and the job they encounter. Then, people are treated properly, while the job is accomplished to standard.

The CR Redevelopment Committee members understand that as RIA and its members gain more experience with applying the knowledge of the Leadership arm of the CRBoK, there will be consensus evolution of the content. Since no single reference fully captures even this somewhat limited array of leadership knowledge, the Committee expects that an RIA Leadership Knowledge Manual may develop after the content is confirmed during the next few years. Along with explanations of the items listed in the Leadership arm, such a reference will probably include a number of scenarios or case studies that enable CR candidates to begin to better understand how the leadership knowledge can be better implemented. Ultimately, the leadership that a professional restorer can deliver will derive from what the person is, what the person knows, and what the person does. Action of some kind is usually a prerequisite for any good that the leader accomplishes.

Leadership Knowledge: Principles – Core Values

Block, Peter. *Stewardship*. (Ch. 1, Replacing leadership with stewardship, pp. 3-22). Berrett-Koehler

Publishers: San Francisco, 1996.

Covey, Stephen R. P*rinciple-Centered Leadership*. Free Press: New York, 1992.

Kouzes, James and Posner, Barry. *Credibility: How Leaders Gain It and Lose It, Why People Demand It.* (Ch. 1, Leadership is a relationship). Jossey-Bass Publishers: San Francisco, 1993.

FM 6-22 (see General References). Part I: The basis of leadership.

Leadership Knowledge: Principles – Ethical Practices

Cordle, D. Tim. Restoration industry ethics. *Cleaning & Restoration* 46, no. 1: 2-5.

Fox, John. Ethics mean action. *Cleaning & Restoration* 41, no. 1: 22-25.

Fox, John. Ethical relationships–part 1. *Cleaning & Restoration* 44, no. 1: 2-4.

Fox, John. Ethical relationships–part 2. *Cleaning & Restoration* 44, no. 2: 2-4.

Fox, John. Ethical relationships with the golden rule–part 3. Cleaning & Restoration 44, no. 3: 3-5.

Fox, John. Ethical team communication. Cleaning & Restoration 44, no. 9: 2-4.

FM 6-22 (see General References). Character, beliefs (values), ethics: p. 4-12 to p. 4-15.

The RIA Code of Ethics. http://restorationindustry.org/content/ria-code-ethics (accessed 8 March 2013).

Violand, Chuck. Sailboats, yachts, and tall-masted ships. *Cleaning & Restoration* 46, no. 1: 2-5.

Leadership Knowledge: Principles – Traits

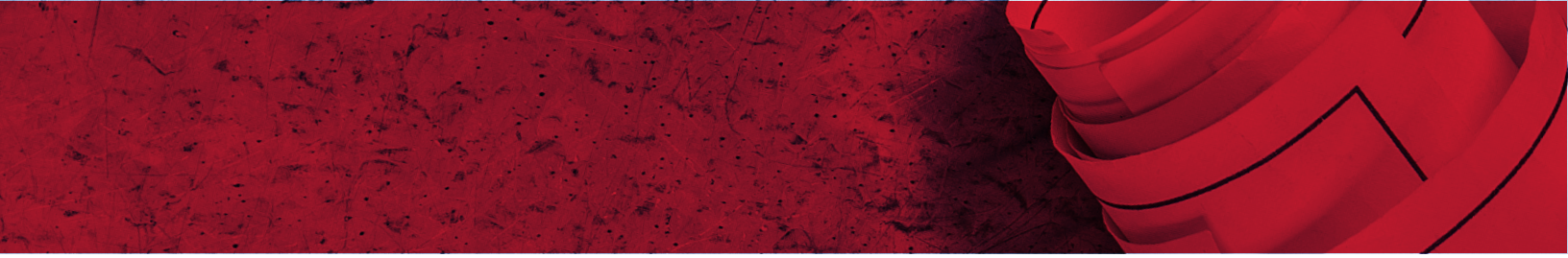
FM 6-22 (see General References). Appendix A: Leader attributes and core leader qualities.

Hudema, D. The role of communication. *Cleaning & Restoration* 42, no. 11: 20-22.

Rapp, Randy and Baroudi, Bassam. What makes a leader? *Cleaning & Restoration* 50, no. 1:10-15.

Leadership Knowledge: Theories - Motivation

Maslow, Abraham. (Deborah Stephens, Ed.). *The Maslow Business Reader*. (Part Two, Management and leadership issues, pp. 93-183). John Wiley and Sons: New York, 2000.



APPENDIX A: Leadership Arm: References

Kotter, John. *Power and Influence.* (Chs. 3, 7, 8, 9, and 11). The Free Press: New York, 1985.

Long, M. L. Using psychology with the insured. *Cleaning & Restoration* (Oct. 78): 4-8.

Padre, Ronald L. Motivation theories of Maslow, Herzberg, McGregor, and McClelland: A literature review of selected theories dealing with job satisfaction and motivation.

http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED316767&ERICExtSearch_SearchType_0=no&accno=ED316767. (accessed January 26, 2013). U.S.

Department of Education, Educational Resources Information Center: Washington, D.C., 1990.

Peters, Thomas and Waterman, Robert. *In Search of Excellence: Lessons from America's Best-Run Companies.* (Ch. 3, Man waiting for motivation, pp. 55-86). Harper and Row Publishers: New York, 1982.

Leadership Knowledge: Theories - Leader Style

Coaching and Charismatic Leadership Styles. http://www.asapm.org/asapmag/articles/LeadershipStyles.pdf

(accessed January 26, 2013; Coaching on p. 2; Charismatic on p. 3)

Collins, James. Good to Great: *Why Some Companies Make the Leap . . . and Others Don't.* Harper Business:

New York, 2001.

Covey, Stephen R. *The Seven Habits of Highly Effective People.* The Free Press: New York, 1989.

Facilitative Leadership Style. http://www.facilitativeleader.com/frset_fl.htm (accessed January 26, 2013)

FM 6-22 (see General References). Coaching: p. 8-13.

Hersey, Paul and Blanchard, Kenneth H. *Leadership and the One Minute Manager.* Harper-Collins: New York, 1 2000.

Kouzes, James and Posner, Barry. *The Leadership Challenge: How to Get Extraordinary Things Done in Organizations.* (Chs. 1, 2, 9, and 13). Jossey-Bass Publishers: San Francisco, 1987

Situational Leadership Style. http://practical-management.com/Leadership-Development/Situational-Leadership.html (accessed January 26, 2013)

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U.S. Department of Commerce. Technology Administration. 1999. *UNIFORMAT II: Elemental classification for building specifications, cost estimating, and cost analysis*, by Robert P. Charette and Harold E. Marshall. Interagency report, National Institute of Standards and Technology (NIST). Pp. 50-53.

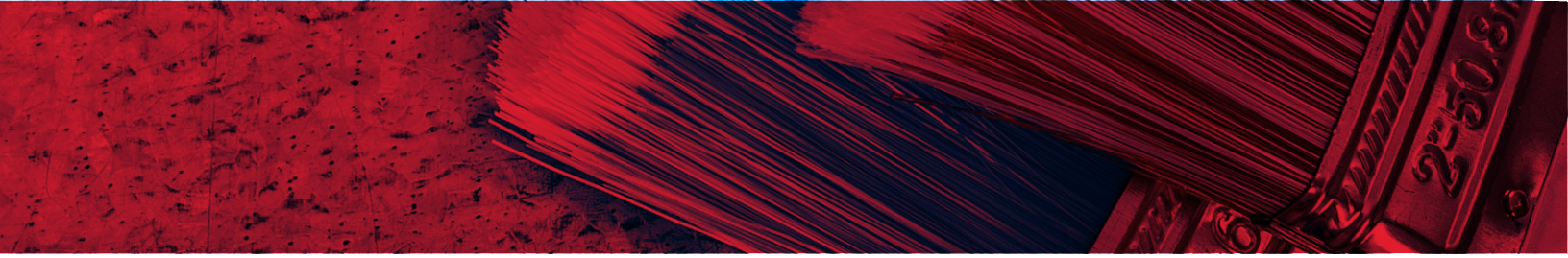
Chowdhury, Subir, ed. *Management 21C.* (Chs. 2-8 and 12-13). Prentice-Hall: London, 2000.Field Manual (FM) No. 6-22. *Army Leadership: Competent, Confident, Agile.* Headquarters (HQ), Department of the Army (DA): Washington, D.C., 2006. http://usacac.army.mil/cac2/Repository/Materials/fm6-22.pdf (accessed January 15, 2013).

Rapp, Randy R. and Pan, Jing. "Disaster Restoration Professional Body of Knowledge." International Journal of Construction Education and Research, vol. 6, no. 3 (2010): 202-218.

Rapp, Randy R. *Disaster Recovery Project Management: Bringing Order from Chaos.* (pp. 13-20, 31-39). Purdue University Press: West Lafayette, IN, 2011.

Technical Knowledge

- **Building Systems**
  - Restoration Strategy
    - ☐ Emergency stabilization
      - Testing
        - ○ Environmental
        - ○ Corrosion
        - ○ Contaminates
      - Utilities
        - ○ Electric
          - ✦ Power
          - ✦ Low voltage
        - ○ Gas
        - ○ Water
        - ○ Cable
      - Climate Control
        - ○ Air movement
        - ○ Air Filtration Device
        - ○ Dry cleaning method
        - ○ Wet cleaning method
        - ○ Neutralization of acidic residue
        - ○ Testing for presence of chlorides
        - ○ Application of corrosion control agents
        - ○ Contaminate Removal
      - Security
        - ○ Preservation of evidence
        - ○ On-site guard
        - ○ Lock and hasp
        - ○ Tarp-over
        - ○ Board up
        - ○ Fencing
      - Winterization
        - ○ Temporary heat
        - ○ Drain plumbing
          - ✦ Fill traps with recreational vehicle antifreeze
          - ✦ Blow out plumbing lines
      - Structural drying
        - ○ Control Source
        - ○ Identify source
          - ✦ Category of water damage
          - ✦ Class of water damage
        - ○ Procedures of drying
          - ✦ Remove liquid water



- ✦ Control evaporation
- ✦ Control humidity
- ✦ Control temperature

○ Drying equipment

- ✦ Air movers
- ✦ Dehumidifiers
- ✦ Extraction units
- ✦ Extraction tools
- ✦ Climate Control
- ✦ Heat drying system
- ✦ Inspection monitoring equipment /Tools

○ Effects of water on material

- ✦ Porous
- ✦ Non-porous
- ✦ Semi-porous

○ Drying documentation

- ✦ Moisture map
- ✦ Record of drying conditions
- ✦ Application Authorization

☐ Demolition

• Equipment

○ Site equipment

- ✦ Generator
- ✦ Dumpster
- ✦ Debris chute
- ✦ Air compressor
- ✦ Robot

○ Crew operated/heavy equipment

- ✦ Hydraulic excavator with attachments
- ✦ Front-end loader
- ✦ Bobcat
- ✦ Crane with attachments
- ✦ Hauler

○ Hand tools

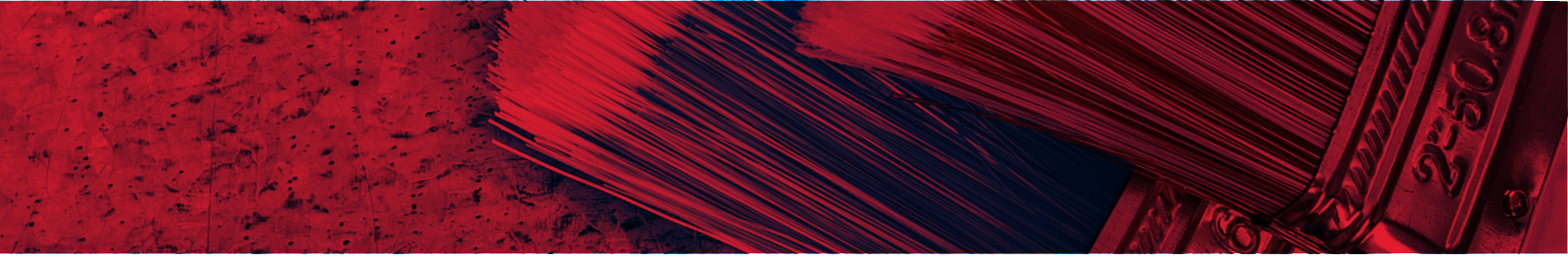
- ✦ Manual
- ✦ Power

• Site plan/preparation

○ Site survey

- ✦ HAZMAT
  - • Forensics
  - • Hording
  - • Blood Borne Pathogens
- ✦ Utilities
- ✦ Structural assessment

- ✦ OSHA engineering survey
- ○ Site organization
  - ✦ Health/safety/environmental (HSE)
    - ♦ Engineering controls
      - › Air filtration device
      - › Containment
      - › Negative air
      - › Dust control device
    - ♦ PPE
  - ✦ Logistics
    - ♦ Storage/stockpiling
    - ♦ Haul routes
- • Debris disposal
  - ○ Recycling
    - ✦ Concrete and CMUs
    - ✦ Ferrous materials
    - ✦ Non-ferrous materials and alloys
    - ✦ Other masonry
  - ○ Landfill
    - ✦ Soft construction and demolition materials
- • Demolition strategy
  - ○ Full
  - ○ Selective
    - ✦ Cut openings
      - ♦ Windows and doors
      - ♦ Other access
    - ✦ Deconstruction/Remove building features
  - ○ Salvage
    - ✦ Architectural features
    - ✦ Structural components
    - ✦ Machinery/equipment
- ☐ Structural cleaning
  - • Surfaces
    - ○ Porous
    - ○ Semi-porous
    - ○ Non-porous
  - • Cleaning process
    - ○ Chemical
      - ✦ Solvents
        - ♦ Water
        - ♦ Dry
      - ✦ Oxidizing agents
      - ✦ Reducing agents
      - ✦ Enzymes
      - ✦ Biocides



- Heat/temperature
- Agitation
  - Negative pressure
    - Vacuum
  - Positive pressure
    - Air wash
  - Abrasive
    - Erasing
    - Brushing
    - Media Blasting
    - Sanding
    - Grinding
    - Polishing
  - Adsorptive
    - Dry sponge
    - Non-staining, solid adsorbent material
    - Sticky tape
    - Crumbly Cleaner (Absorene)
  - Absorptive
    - Dry sweep
    - Poultice
- Dwell Time

☐ Deodorization

- Principles
  - Eliminate source
  - Clean source area
  - Recreate conditions
  - Encapsulate surface
  - Control temperature
- Classes of deodorization agents
  - Absorption and adsorption
  - Odor / Counteraction
  - Antimicrobial
  - Enzymes
  - Oxidizers
  - Encapsulants
  - Desorbants
- Equipment
  - Chemical applicator
    - Vapor
    - Pump
    - Electrical
    - Pressure
  - Air movers
    - Filtered

- ♦ HEPA
- ♦ ULPA
- ♦ Activated carbon

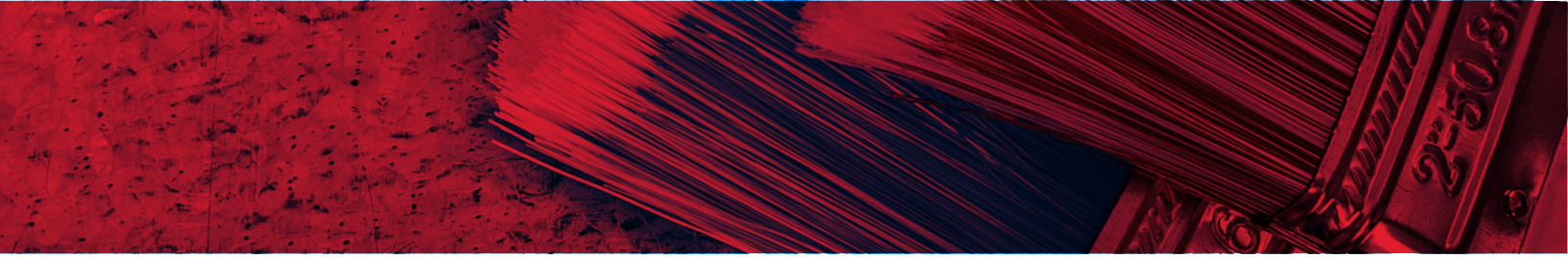
- ✦ Non-filtered

- ○ Foggers
  - ✦ Thermal
  - ✦ Wet
- ○ Generators
  - ✦ Ozone
  - ✦ Hydroxyl

- Odor sources
  - ○ Biological
    - ✦ Skunk
    - ✦ Putrification
    - ✦ Sewage
    - ✦ Fungal / Bacteria / MVOCs
  - ○ Chemical
    - ✦ Bitumens
    - ✦ Volatile organic compounds (VOCs)
    - ✦ Drug labs
    - ✦ Tear Gas
  - ○ Smoke
    - ✦ Protein
    - ✦ Natural
    - ✦ Synthetic

- ☐ Repair
- ☐ Replace

- Identification
  - ☐ Substructure
    - Standard foundations
      - ○ Spread footings
      - ○ Strip footings
      - ○ Foundation under-drain
      - ○ Crawlspaces
    - Special foundations
      - ○ Concrete piles
        - ✦ Cast-in-place
        - ✦ Pre-cast
      - ○ Steel piles
        - ✦ Pipes
        - ✦ H-section
        - ✦ Step-tapered
      - ○ Treated wood piles
      - ○ Grade beams



- Caissons or piers
- Pressure-injected footings

- Slab-on-grade
  - Non-reinforced
  - Reinforced
    - Normally reinforced
    - Post-tensioned
- Basement walls
  - Masonry walls
    - CMU, block
      - Non-reinforced
      - Reinforced
    - Stone
  - Cast-in-place
    - Non-reinforced
    - Reinforced
    - Insulated block
  - Pre-cast or pre-fab
  - Treated wood

☐ Shell / Building Envelope

- Floor
  - Building floor types
    - Suspended
    - Upper floors
    - Balcony floors
    - Ramps
    - Exterior stairs/fire escapes
    - Floor raceway systems
    - Raised floors
  - Floor structural components
    - Beams and joists
      - Wood
        - Dimensioned lumber
        - Engineered
        - Heavy timber
      - Steel
        - Light gauge
        - Joists on beam and wall
        - Deck and joists on bearing wall
      - Concrete
      - Cast-in-place
      - Pre-cast
    - Concrete slabs
      - Cast-in-place
        - Normally reinforced

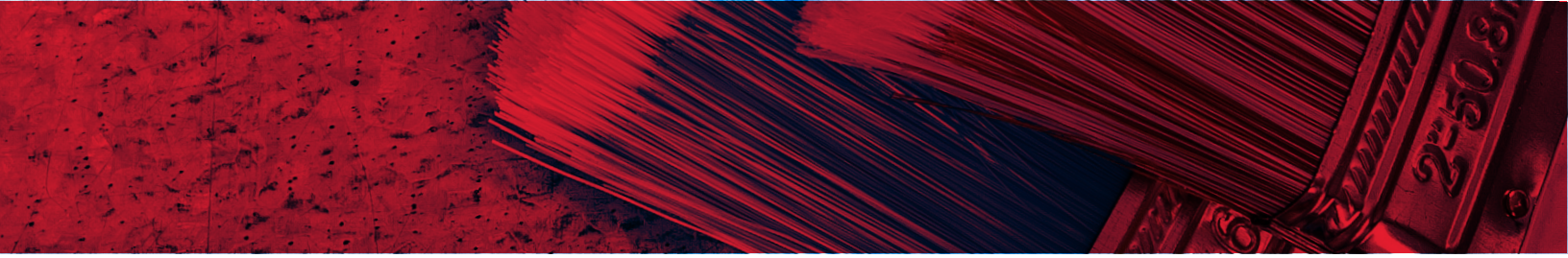
- Post-tensioned
- Waffle slab
- Metal deck concrete fill

- Pre-cast
  - Normally reinforced
  - Pre-stressed
  - Beam and plank
  - Plank
  - Double T-section

- Beam and slab
  - Cast-in-place, 1 way
  - Cast-in-place, 2 way
  - Composite beam and cast-in-place slab

- Columns
  - Wood
    - Dimensioned lumber
    - Engineered lumber
    - Heavy timber
  - Steel
  - Concrete
    - Spiral reinforcement
    - Tied reinforcement

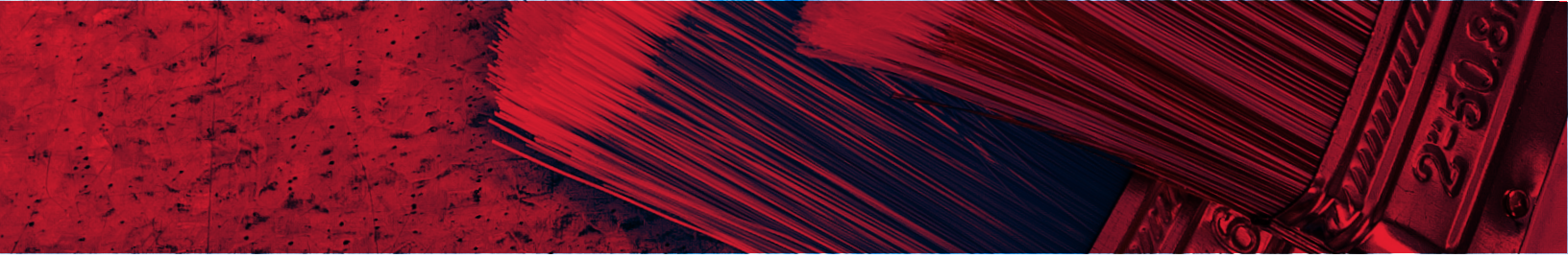
- Roof
  - Roof construction
    - Styles
      - Flat
      - Pitched
        - Gable
        - Hip
        - Mansard
        - Gambrel
        - Shed
        - Turret
    - Structure
      - Wood
        - Engineered trusses
        - Rafters
        - Engineered beams
      - Steel
        - Joists and deck on bearing walls
        - Joists, beams, and deck on columns
        - Joists, joist girders, and deck/walls
        - Ribbed
        - Cellular deck
  - Roof coverings



- Roof finishes
  - Flat
    - Single-ply
    - Bituminous
    - Vegetative
  - Sloped
    - Metal
    - Slate
    - Tile
    - Shingle
    - Shake
    - Fiberglass
- Traffic toppings and paving
  - Gravel
  - Pavers
  - Membranes
  - Pads
- Insulation and fill
  - Foam in place
    - Spray / inject
  - Batt or blanket
  - Rigid board
  - Loose fill
  - Cast
  - House wrap
- Exterior flashings and trims
  - Flashing
    - Step
    - Cap
    - Base
    - Kick out
    - Counter
    - Pipe
    - Valley
    - Drip edge
    - Ice and Water Shield
    - Z-flashing
  - Trim
    - Ridge cap
    - Corner
    - J-trim
    - Eave trim
    - Fascia
- Roof eaves and soffits
  - Enclosed flat

- ♦ Enclosed angle
- ♦ Open with exposed truss
- ✦ Scuppers, gutters, and downspouts
- ○ Roof openings
- ✦ Skylights
- ♦ Fixed
- ♦ Operating
- ✦ Hatches
- ✦ Vents
- ♦ Gravity
- ♦ Power

• Exterior enclosure
- ○ Exterior walls
- ✦ Exterior wall construction
- ♦ Concrete
- › Cast-in-place
- △ Non-reinforced
- △ Reinforced
- › Pre-cast
- › Tilt-up panels
- ♦ Masonry
- › Brick
- △ Single Wythe
- △ Double Wythe
- * Non-reinforced
- * Reinforced
- › Concrete masonry unit and other block
- △ Non-reinforced
- △ Reinforced
- › Stone veneer
- ♦ Stud walls
- › Wood studs
- › Metal studs
- ♦ Curtain walls
- › Masonry
- › Glazed
- ♦ Siding
- › Vinyl
- › Aluminum
- › Fiber cement
- › Wood
- › Stucco
- › EFIS
- › Asbestos shingles
- › Galvanized steel



- ♦ Insulation
  - › Batt or blanket
  - › Foam in place
  - › Rigid board
  - › Loose fill
  - › Cast
  - › House wrap
- ✦ Parapets
- ✦ Exterior louvers, screens, and fencing
- ✦ Exterior sun control devices
  - ♦ Awnings
  - ♦ Pergola
- ✦ Balcony walls and handrails
- ✦ Exterior soffits

○ Exterior doors

- ✦ Style
  - ♦ Glazed
  - ♦ Solid exterior
  - ♦ Revolving
  - ♦ Overhead
  - ♦ Others doors and entrances
    - › Storm
    - › Air curtain
    - › Pet
- ✦ Type of construction
  - ♦ Wood
  - ♦ Aluminum
  - ♦ Metal
  - ♦ Steel
  - ♦ Fiberglass
  - ♦ Glass

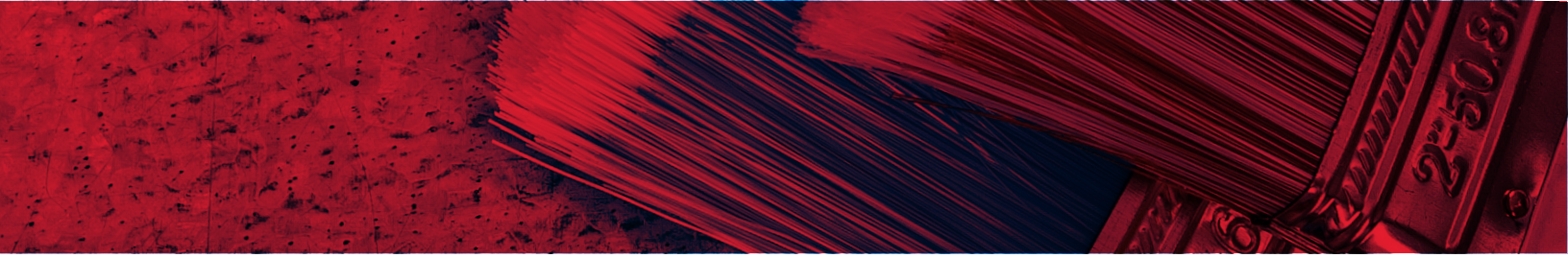
○ Exterior windows

- ✦ Style
  - ♦ Casement
  - ♦ Double hung
  - ♦ Single hung
  - ♦ Slider
  - ♦ Fixed
  - ♦ Atrium
  - ♦ Glass block
  - ♦ Awning
- ✦ Type of construction
  - ♦ Wood
  - ♦ Aluminum
  - ♦ Thermal panes

- ♦ Fiberglass
- ♦ Glass
  - › Single pane
  - › Tempered
  - › Thermal

☐ Interior

- • Interior construction
  - ○ Partitions
    - ✦ Fixed
      - ♦ Drywall
      - ♦ Lath and plaster
      - ♦ Masonry
      - ♦ Pre-fabricated panel
    - ✦ Demountable
    - ✦ Retractable
    - ✦ Balustrades and screens
    - ✦ Windows/storefronts
  - ○ Interior doors
    - ✦ Style
      - ♦ Bi-fold
      - ♦ Folding
      - ♦ Sliding
      - ♦ Pocket
      - ♦ Standard hinge
      - ♦ Café
      - ♦ Specialty
    - ✦ Type
      - ♦ Wood
        - › Solid
        - › Hollow core
      - ♦ Metal
        - › Solid
        - › Hollow core
      - ♦ Fiberglass
        - › Solid
        - › Hollow core
      - ♦ Glazed
    - ✦ Frames
      - ♦ Wood
      - ♦ Metal
    - ✦ Hardware
      - ♦ Latches
      - ♦ Closers
      - ♦ Kick plates
      - ♦ Emergency



- ♦ Knobs and handles
- ✦ Wall opening
- ✦ Side lights and transoms
- ✦ Interior hatches and access

○ Fittings and fixtures

- ✦ Fabricated toilet partitions
- ✦ Fabricated compartments and cubicles
- ✦ Storage shelving and lockers
- ✦ Ornamental metals and handrails
- ✦ Identifying devices and signs
- ✦ Closet specialties
- ✦ General fittings and miscellaneous metals
- ✦ Cabinets and tops

• Stairs

○ Styles

- ✦ Regular box
- ✦ Curved
- ✦ Spiral
- ✦ Handrails and balustrades

○ Finishes

- ✦ Tread and landing
- ✦ Soffit
- ✦ Handrail and balustrade

○ Materials

- ✦ Wood
- ✦ Metal
- ✦ Concrete

• Interior finishes

○ Wall finishes

- ✦ Wall finishes to inside exterior walls ~Moisture sealant
  - ♦ Grout
- ✦ Wall finishes to interior walls, posts, and columns ~Paint
  - › Oil
  - › Latex
  - ♦ Gesso
  - ♦ Epoxy
  - ♦ Wallpaper
    - › Foil
    - › Grass cloth
    - › Vinyl
    - › Paper
  - ♦ Paneling
    - › Sheet
      - △ Waterproof
      - △ Vinyl covered

- △ Composite
- △ Wood
- › Plank
  - △ Wood
  - △ Composite
- ♦ Insulation
  - › Fiberglass
  - › Polymers
  - › Mineral wool
- ♦ Stone
- ♦ Tile

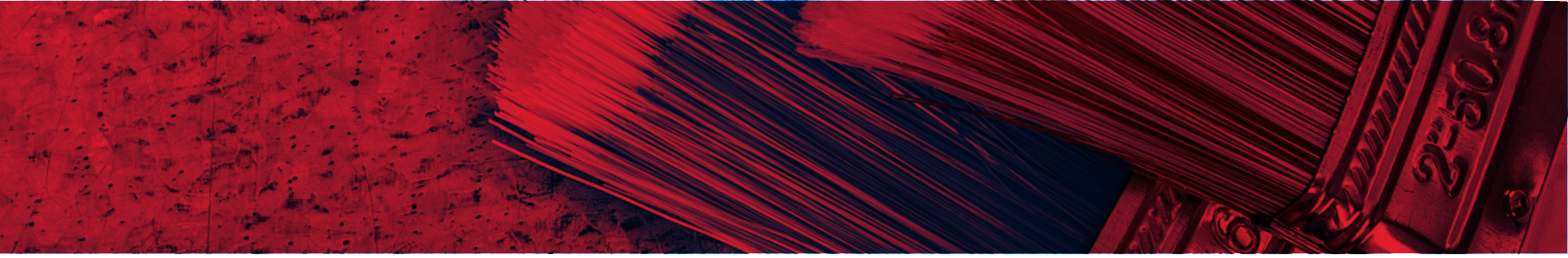
✦ Trim

- ♦ Crown molding
- ♦ Corner
- ♦ Chair rail
- ♦ Baseboard
- ♦ Shoe/quarter round
- ♦ Casing
- ♦ Decorative

○ Floor finishes

✦ Carpet

- ♦ Construction
  - › Tufted
    - △ Cut pile
    - △ Loop pile
    - △ Cut loop
  - › Woven
    - △ Axminster
    - △ Wilton
    - △ Velvet
  - › Modular tile
- ♦ Cushion
  - › Rebond
  - › Urethane foam
  - › Felt
  - › Waffle
- ♦ Installation types
  - › Stretched in
  - › Glued down
  - › Double stick
- ♦ Fiber identification
  - › Nylon
  - › Polyester
  - › Olefin
  - › Cotton



- › Jute
- › Wool
- › Acrylic
- › Triexta
- ♦ Backing
  - › Cushion
  - › Polypropylene
  - › Soft back
- ♦ Finishes
  - › Fluorochemical
  - › Acid-dye resisters
- ♦ Style
  - › Frieze
  - › Shag
  - › Saxony
  - › Sculptured
  - › Velvet plush
  - › Berber
- ✦ Wood
  - ♦ Construction
    - › Solid
    - › Engineered
    - › Laminate
  - ♦ Installation types
    - › Glued
    - › Nailed
    - › Floating
- ✦ Vinyl
  - ♦ Sheet goods
  - ♦ Tile
- ✦ Poured epoxy
- ✦ Tile
  - ♦ Ceramic
  - ♦ Porcelain
  - ♦ Terrazzo
- ✦ Specialty
  - ♦ Bamboo
  - ♦ Cork
  - ♦ Stone
  - ♦ Marble
  - ♦ Concrete

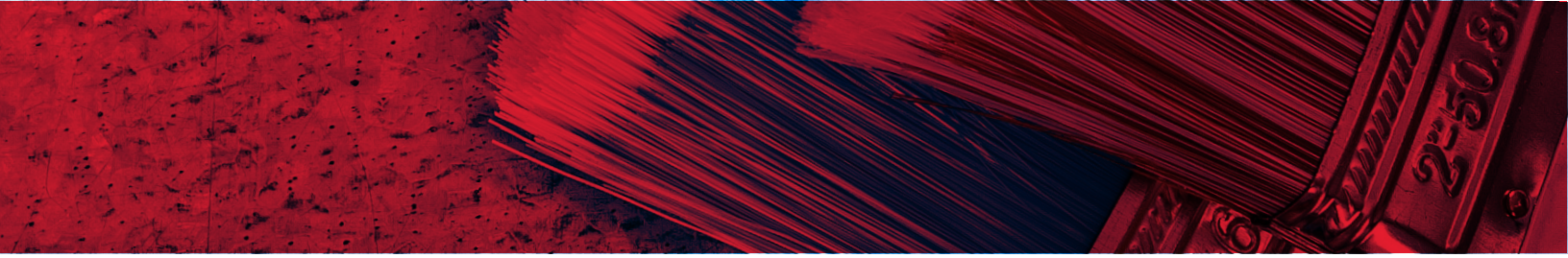
○ Ceiling finishes

- ✦ Plaster
- ✦ Drywall
- ✦ Tin

- ✦ Wood
- ✦ Acoustic tile
- ✦ Specialty
  - ♦ Stucco
  - ♦ Popcorn and stipple
  - ♦ Hand-stippling
- ○ Suspended ceilings

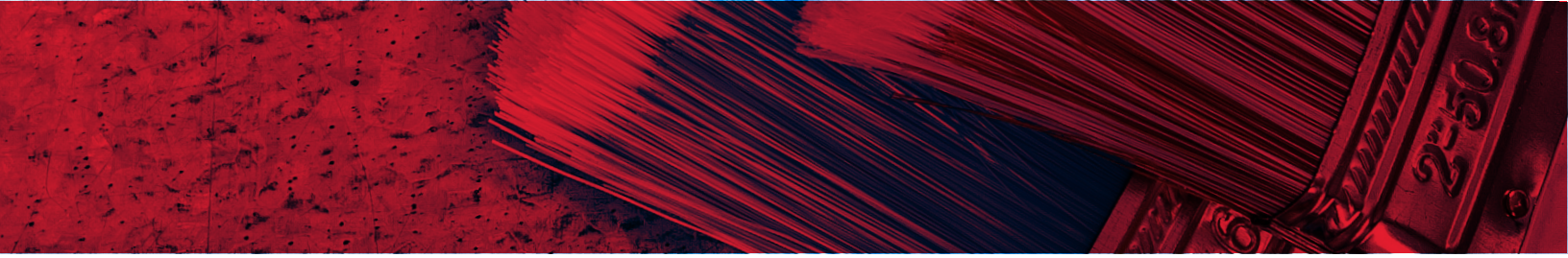
☐ Services

- • HVAC
  - ○ Energy supply systems
    - ✦ Oil
    - ✦ Gas
      - ♦ Propane
      - ♦ Natural
    - ✦ Coal
    - ✦ Electrical
    - ✦ Steam
    - ✦ Hot water
    - ✦ Solar
    - ✦ Geothermal
    - ✦ Wind
    - ✦ Wood
  - ○ Heat generating systems
    - ✦ Boilers
    - ✦ Furnaces
  - ○ Cooling generating systems +Chilled water
    - ✦ Direct expansion
  - ○ Distribution systems
    - ✦ Forced air
      - ♦ Change-over
      - ♦ Ducts
        - › Rigid
        - › Flexible
        - › Insulated
      - ♦ Registers, returns, diffusers
    - ✦ Radiator
      - ♦ Cast-iron
      - ♦ Baseboard
    - ✦ Radiant
      - ♦ Electric mats
      - ♦ Hydronic radiant floor heating
  - ○ Terminal and package units
  - ○ Controls and instrumentation
    - ✦ Heating generating systems
    - ✦ Cooling generating systems



        - Heating-cooling air handling units
        - Exhaust and ventilating systems
        - Hoods and exhaust systems
        - Terminal devices
        - Energy monitoring and control
        - Building automation systems
        - Recording systems
    - Other HVAC systems and items
        - Special heating, cooling and ventilation systems and devices
        - Special humidity control
        - Dust and fume collectors
        - Air curtains
        - Air purifiers
        - Paint spray booth ventilation
        - General construction items
        - Makeup air system
- Plumbing
    - Fixtures
        - Water closets
        - Urinals
        - Lavatories
        - Sinks
        - Bathtubs
        - Wash fountains
        - Showers
        - Drinking fountains and coolers
        - Bidets and other plumbing fixtures
    - Water distribution
        - Cold water service
        - Hot water service
        - Domestic water supply equipment
    - Sanitary waste
        - Waste piping
        - Vent piping
        - Floor drains
        - Grinders and pumps
        - Pipe installation
    - Rainwater drainage
        - Pipes and fittings
        - Roof drains
        - Cistern and sump pumps
        - Pipe insulation
    - Other plumbing
        - Gas distribution
        - Acid waste systems

        - ✦ Interceptors
        - ✦ Pool piping and equipment
        - ✦ Decorative fountain piping devices
        - ✦ Irrigation
        - ✦ Other piping systems
    - Fire protection
        - ○ Sprinklers
            - ✦ Sprinkler water supply
            - ✦ Sprinkler pump equipment
            - ✦ Dry sprinkler system
        - ○ Standpipes
            - ✦ Standpipe water supply
            - ✦ Pump equipment
            - ✦ Standpipe equipment
            - ✦ Fire hose equipment
    - Electrical
        - ○ Service and distribution
            - ✦ High tension service and distribution
            - ✦ Low tension service and distribution o Lighting and branch wiring
            - ✦ Branch wiring devices
            - ✦ Lighting equipment
        - ○ Generators
        - ○ Storage
    - Communication and security
        - ○ Public address and music
        - ○ Intercommunication/paging/call
        - ○ Telephone
        - ○ Television
        - ○ Clock and program
        - ○ Fire alarm
        - ○ Security and detection
        - ○ Local area networks
    - Conveying
        - ○ Elevators and lifts
        - ○ Escalators and moving walks
- ☐ Installed equipment
    - Fixed multiple seating
    - Commercial equipment
    - Restaurant Equipment
        - ○ Security and vault
        - ○ Teller and service
        - ○ Registration
        - ○ Check-room
        - ○ Mercantile
        - ○ Laundry and dry cleaning



- Vending
- Office
- Manufacturing

- Institutional equipment
  - Ecclesiastical
  - Library
  - Theater and stage
  - Instrumental
  - Audio/Visual
  - Detention
  - Lab
  - Medical
- Vehicular equipment
  - Vehicular service
  - Parking control
  - Loading dock

☐ Building site work
- Landscaping
- Pavements and sidewalks
- Drainage
  - Surface
  - Subsurface

Contents

Restoration Strategy

☐ Evaluation Process
- Prioritize
  - Test / Sample Cleaning
  - Emergency stabilization
    - ✦ Corrosion control
    - ✦ Drying/freezing
    - ✦ Pre-cleaning
  - Processing
    - ✦ Pack out
    - ✦ Onsite cleaning
- Inventory
  - Salvageable
    - ✦ Pre-existing condition report
    - ✦ Photographic log
  - Non-salvageable

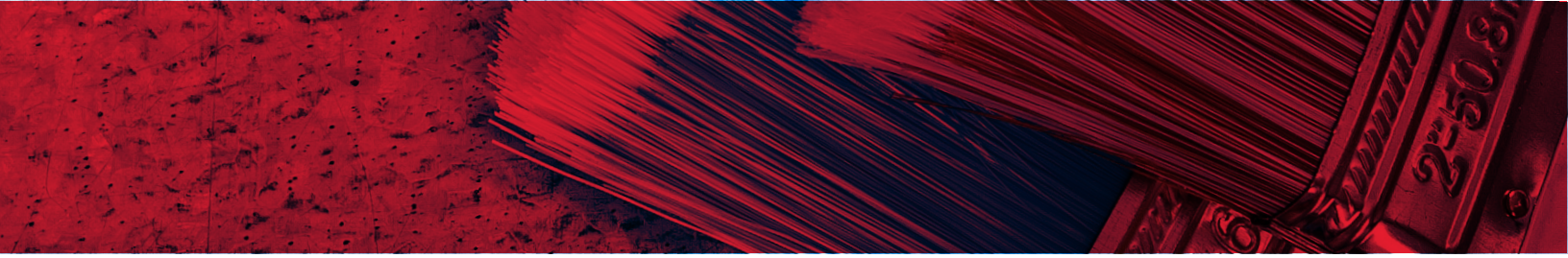
☐ Cleaning Processes
- Chemical
  - Solvents
    - ✦ Water
    - ✦ Dry

- Oxidizing agents
- Reducing agents
- Enzymes
- Biocides

- Heat/temperature
- Agitation
  - Negative pressure
    - Vacuum
  - Positive pressure
    - Air wash/sparging
    - Media blasting
    - Water
  - Abrasive
    - Cavitation
    - Erasing
    - Brushing
    - Sanding
  - Adsorptive
    - Dry sponge
    - Non-staining solid adsorbent material
    - Sticky tape
  - Absorptive
    - Dry sweep
    - Poultice
- Time
- Specialty
  - Gamma irradiation
  - Ethylene oxide

☐ Packing/Handling/Storage Processes

- Supplies
  - Boxes/containers/crates
  - Wraps
    - Bubble
    - Mattress bags
    - Shrink
    - Soft roll
    - Newsprint
  - Other supplies
- Inventory control
  - Bar coding
  - Photo-Video inventory
  - Written documentation
- Storage systems
  - Open
  - Modular



- Rack
- Materials and Equipment
  - Large
    - Fork lifts
    - Pallet jacks
    - Rug drying racks
    - Climate Control
  - Small
    - Furniture pads
    - Moving blankets
    - Dollies
    - Straps
    - Sliders
    - Air sleds
    - Pallets

☐ Deodorization Processes

- Equipment
  - Hydroxyl
  - Ozone
  - Wash system
    - Textile
    - Ultrasonic
  - Media blaster
  - Hand tools
  - Downdraft Table
  - HEPA vacuums
  - Fogger
  - Air scrubbers

☐ Specialty Restoration

- Art☐
- Electronic☐
- Document☐
- Furniture☐
- Textiles☐
- Furs and leathers☐

☐ Pack In Process

- Pre-delivery inspection☐
- Inventory review☐
- Delivery☐
- Certificate of Satisfaction☐
- Authorization to Pay☐

- Identification

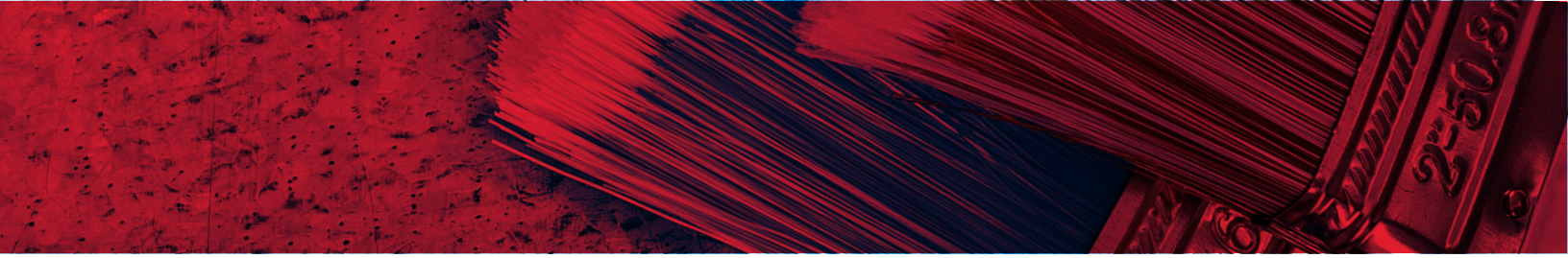
☐ Classifications

- Antique☐

- Heirloom□
- Period□
- Styles□

☐ Furniture

- Hard
  - ○ Tables
    - ✦ End
    - ✦ Coffee
    - ✦ Sofa
    - ✦ Dining
    - ✦ Nested
    - ✦ Tilt top
    - ✦ Game
    - ✦ Vanity/Dressing
    - ✦ Computer
    - ✦ Others
  - ○ Chairs
    - ✦ Club
    - ✦ Rocking
    - ✦ Side
    - ✦ Ladder back
    - ✦ Barrel
    - ✦ Captain
    - ✦ Massaging
  - ○ Storage
    - ✦ Entertainment centers
    - ✦ China cabinets
    - ✦ File cabinets
    - ✦ Desks
    - ✦ Bookcases
    - ✦ Credenzas
    - ✦ Chests of drawers
    - ✦ Cedar chests
    - ✦ Armoires
    - ✦ Dressers
    - ✦ Nightstands
    - ✦ Liquor cabinets
    - ✦ Gun cabinets
    - ✦ Lockers
    - ✦ Deacon benches
    - ✦ Hall trees
  - ○ Beds
    - ✦ Headboard
    - ✦ Footboard
    - ✦ Crib



        - Cradle
        - Futon
        - Bunk
        - Waterbed frame
        - Hospital
- Soft
    - Sofa
        - Chesterfield
        - Camelback
        - Tuxedo
        - Settee
        - Lawson
        - Charles of London
        - Love seats
        - Chaise lounge/fainting couch
        - Sectional
    - Chairs
        - Recliner
        - Bean bag
        - Wing
        - Club
        - Corner
        - Window seat
        - Closed arm occasional
        - Fan back
        - Shell
        - Barrel
        - Open-arm pull up
        - Motorized
        - Bank of England
        - Fireside
        - Cogswell
        - Tub
        - Lawson
        - Charles of London
        - Cockfight
        - Tete-a-tete
    - Mattress/box springs
        - Waterbed/waveless
        - Memory foam
        - Leave on – feather
        - Air
    - Upholstery fabrics
        - Natural
            - Cotton

- ♦ Linen
- ♦ Wool
- ♦ Leather
- ♦ Silk
- ♦ Rush/cane

✦ Synthetic

- ♦ Saran
- ♦ Polyester
- ♦ Nylon

✦ Textiles

- ♦ Olefin
- ♦ Modacrylic
- ♦ Rayon

✦ Weave

- ♦ Plain
- ♦ Twill
- ♦ Satin
- ♦ Jacquard
- ♦ Pile
- ♦ Knitting
- ♦ Basket

✦ Style

- ♦ Brocade
- ♦ Damask
- ♦ Haitian cotton
- ♦ Denim
- ♦ Moiré
- ♦ Flocking

☐ Textiles

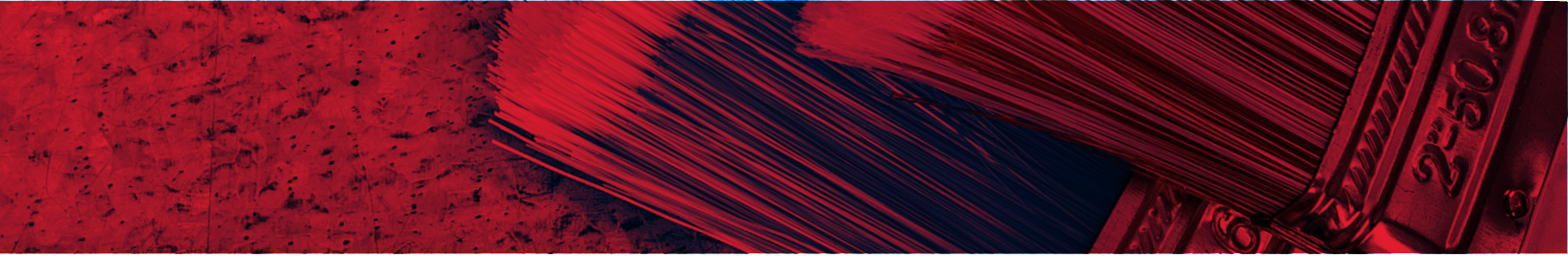
- ○ Draperies
  - • Lined
  - • Unlined
  - • Specialty
  - • Valance
  - • Sheers
  - • Panels

☐ Linens

- ○ Towels
- ○ Bedding
- ○ Tablecloths, napkins, scarves
- ○ Pillows

☐ Clothing

- ○ Outerwear
- ○ Innerwear
- ○ Intimates

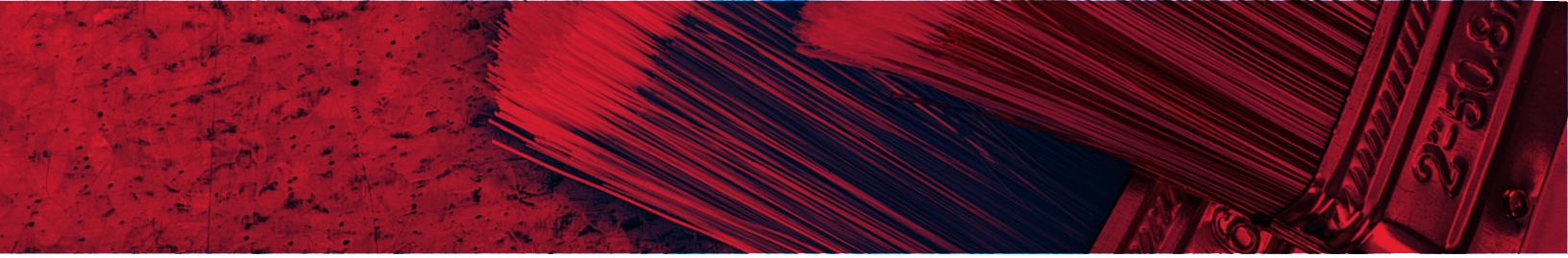


- Accessories□
- Purses
- Shoes
- Wallets
- Belts
- Hats
- Scarves
- Ties
- Gloves

- Stuffed toys
- Floor coverings
  - Oriental rugs
  - Specialty rugs
  - Domestic rugs

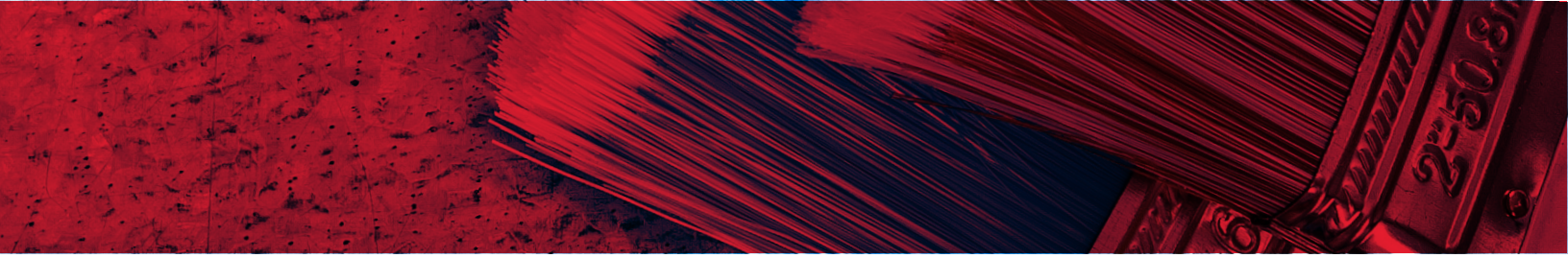
- Appliances
  - Large□
    - Stove
      - Gas
      - Electric
      - Wood
    - Refrigerator
    - Freezer
    - Washer
    - Dryer
    - Dishwasher
      - Small□
    - Toaster oven
    - Coffee maker
    - Clothes iron
    - Waffle iron
    - Mixer
      - Hand
      - Tabletop
    - Blender
    - Food processor
    - Microwave
    - Electric skillet
    - Vacuum cleaner
    - Blow dryer
    - Electric toothbrush
    - Electric shaver
    - Flatiron
    - Curling iron
    - Other specialty appliances

- Electronics
    - Computers/peripherals
        - Desktop
        - Portables
        - Server
    - Phones
        - Landline
        - Cell
        - Smartphone
    - Satellite equipment
        - Transceiver
        - Navigational device
        - Receiver/DVR
        - Dish
        - Internet devices
    - Electronic storage devices
        - Tapes
        - CDs and DVDs
        - Flash drives
        - External hard drive
    - Video devices
        - Viewing
            - Surveillance
            - Media players
            - Projection equipment
            - Gaming consoles and accessories
            - Television
    - Recording
            - Cameras
                - Video
                - Photo
            - DVRs
            - VHS
    - Audio devices
        - Stereo
        - Radio
        - Professional sound equipment
    - Small devices
        - Cameras
        - Clocks
    - Collectibles
        - Dolls□
    - Clothing and footwear□
        - Vintage
        - Costume



- Jewelry
  - Vintage
  - Costume
- Coins
- Ceramics/china/glassware/porcelain
- Wine/alcohol
- Cigars
- Taxidermy
- Keepsakes
- Other
- Art work
- Drawing
  - Chalk
  - Pen and ink
  - Charcoal
- Painting
  - Oil
  - Acrylic
  - Watercolor
- Sculpture
  - Clay
  - Wood
  - Metal
  - Pottery
  - Glass
  - Textiles
- Print
  - Lithography
  - Etching
  - Silk-screening
- Film
  - Legacy
  - Digital
  - Slides
- Jewelry and accessories
- Toys and games
- Household dining ware and décor
- Stemware
  - Plateware
  - Flatware
  - Cookware
  - Pottery
  - Figurines
  - Statues
  - Brick-a-brac

- Documents and archival materials
- Books
  - Records
  - Paper
  - Digital
  - Film
  - Other
- Rare historic documents
- Signed collections
  - Photographs
  - Posters
  - Letters
  - Prints/lithographs
  - Stamps
  - Trading and sports cards
- Specialty
  - Pet items
  - Cages
  - Houses
  - Aquariums
  - Specialty
  - Musical instruments
  - Wind
  - Strings
  - Keyboards
  - Percussion
  - Electronic
  - Seasonal decorations
  - Plant décor
  - Artificial
  - Live
  - Recreational
  - Spas/hot tubs/sauna
  - Camping
  - Sporting goods
  - Livery
  - Luggage/backpacks
  - Archery
  - Fishing
  - Firearms
  - Long or shoulder arms
    - Rifle
    - Shotgun
  - Handguns
    - Revolver



- ✦ Semi-automatic pistol
- Common accessories
  - ✦ Optics
  - ✦ Magazines
  - ✦ Reloading equipment
  - ✦ Gun cases and scabbards
  - ✦ Holsters
- Ammunition
- Defensive implements□

○ Portable equipment

- Healthcare□
- Residential□
- Agricultural□
- Manufacturing□
- Industrial□
- Food service□
- Institutional□
- Hospitality

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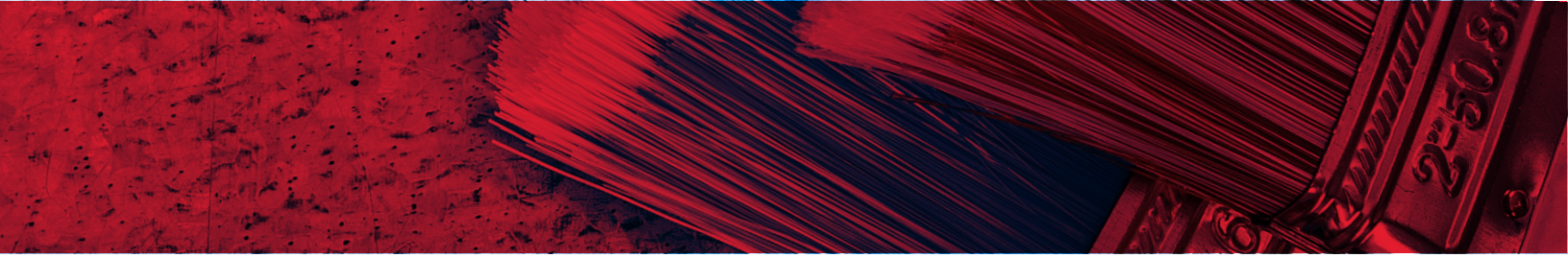

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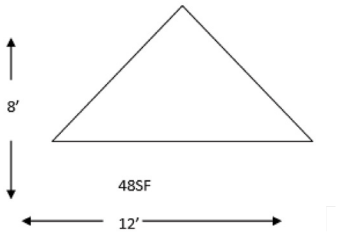
APPENDIX C: Measurements and Structural Diagrams

Measurement/Formulas

Gable end



½ length (x) height = total SF
6 X 8 = 48 SF

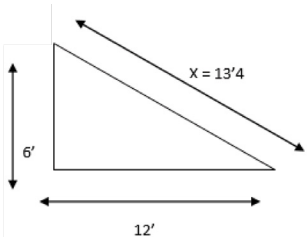
Gable end rafter length
(Height squared) + (Length squared) = X

Square root of X = total length

6X6 = 36

12X12=144

180 √ =13′4



Formula for determining Board Feet

Width (inches) x Height (inches) X Length (feet) = Board feet
12
SQUARE FEET = L X W CUBIC FEET = L X W X H
SQUARE YARDS = TOTAL SF/9

Dehumidifier Calculation
Cubic feet of affected area (Drying chamber) ÷ Class of Loss ÷ AHAM* Rating of unit = Number of units
**Association of Home Appliance Manufacturers*

Initial Desiccant Dehumidifier Calculations (based on air exchanges per hour or ACH)
Formula: ft3 ÷ 60 min + cfm x # ACH (see chart) + total cfm required. Divide this number by the dehumidifier's process cfm = # units

1. Example: 3000 sf Class 4 project with 12′ ceilings = 36,000ft3
2. 36,000 ft3 ÷ 60 minutes = 600 cubic feet per minute (cfm)
3. 600 cfm x 2 ACH = a requirement for 1800 cfm of desiccant dehumidifiers
4. 1200 cfm ÷ desiccant dehumidifier output (e.g. desiccant dehumidifier @ 600 cfm) = 2 units needed for effective drying.

Calculate the cubic footage of the affected room of area. Example: 30′x50′ = 1500 ft2 x 8′
ceiling height = 12,000 ft3.

Note: The recommendations arrived at using this process from a starting point that is based on research and observation in IICRC - approved Applied Structural Drying houses. Psychometric readings recorded on the Daily Humidity Record dictate decisions about on-going dehumidifier capacity throughout the drying process. Adjustments may be necessary.

APPENDIX C: Measurements and Structural Diagrams

Air Machine Devices
Cubic feet per minute (CFM):
Cubic feet of space ÷ Air Exchanges = total CFM needed, then ÷ CFM at Operating Capacity = Number of units

Air mover Placement - 1 air mover for each 10 to 16 linear feet of wall (S500 – 2006 Chapter 14.)
Rate of Evaporation: **Dalton's Law Formula** is mathematically expressed as: E=fd(u)(Es-Ea)

E = Rate of Evaporation
Fd(u) = A function of the mean wind speed (u)
Es = saturation vapor pressure at the temperature of the water surface
Ea = Vapor pressure of the air

Amps: Amperes x volts x 3.4 = **British Thermal Units** (BTU) per hour

Power Consumption / Cost of Equipment Operation
Formula: voltage x amps x 24 hours = watt-hours per day
Watt-hours ÷1000 watt-hours/kw-hour = kw-hours
Kw x 24-hr x cost per kw-hr = total cost to operate per day.

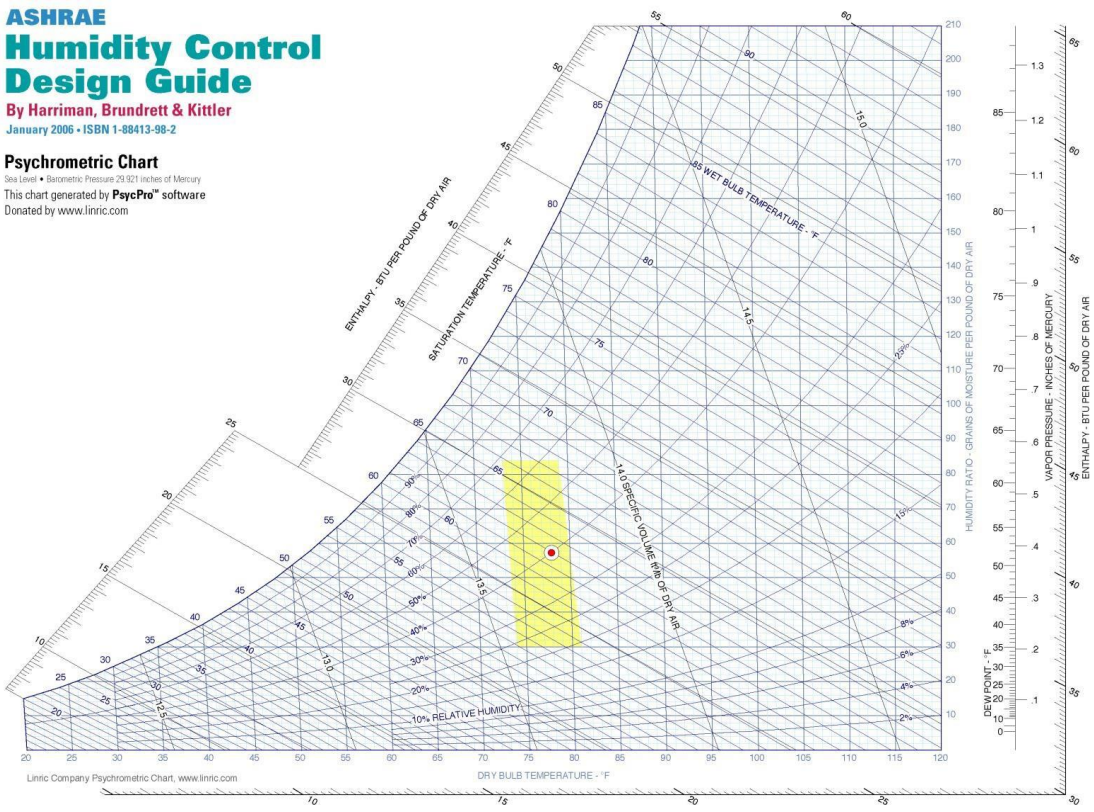
Cubic Ft of water to gallons of water
Ft2 x inches depth ÷ 12″ = ft3 water x 7.48 = # of gallons

Grains of Moisture - 7000 grains of moisture =1 pound

Class I Vapor Retarder	0.1 perm or less
Class II Vapor Retarder	1.0 per or less and greater than 0.1 perm
Class III Vapor Retarder	10 perm or less and greater than 1.0 perm

STRUCTURAL DIAGRAMS/ILLUSTRATIONS

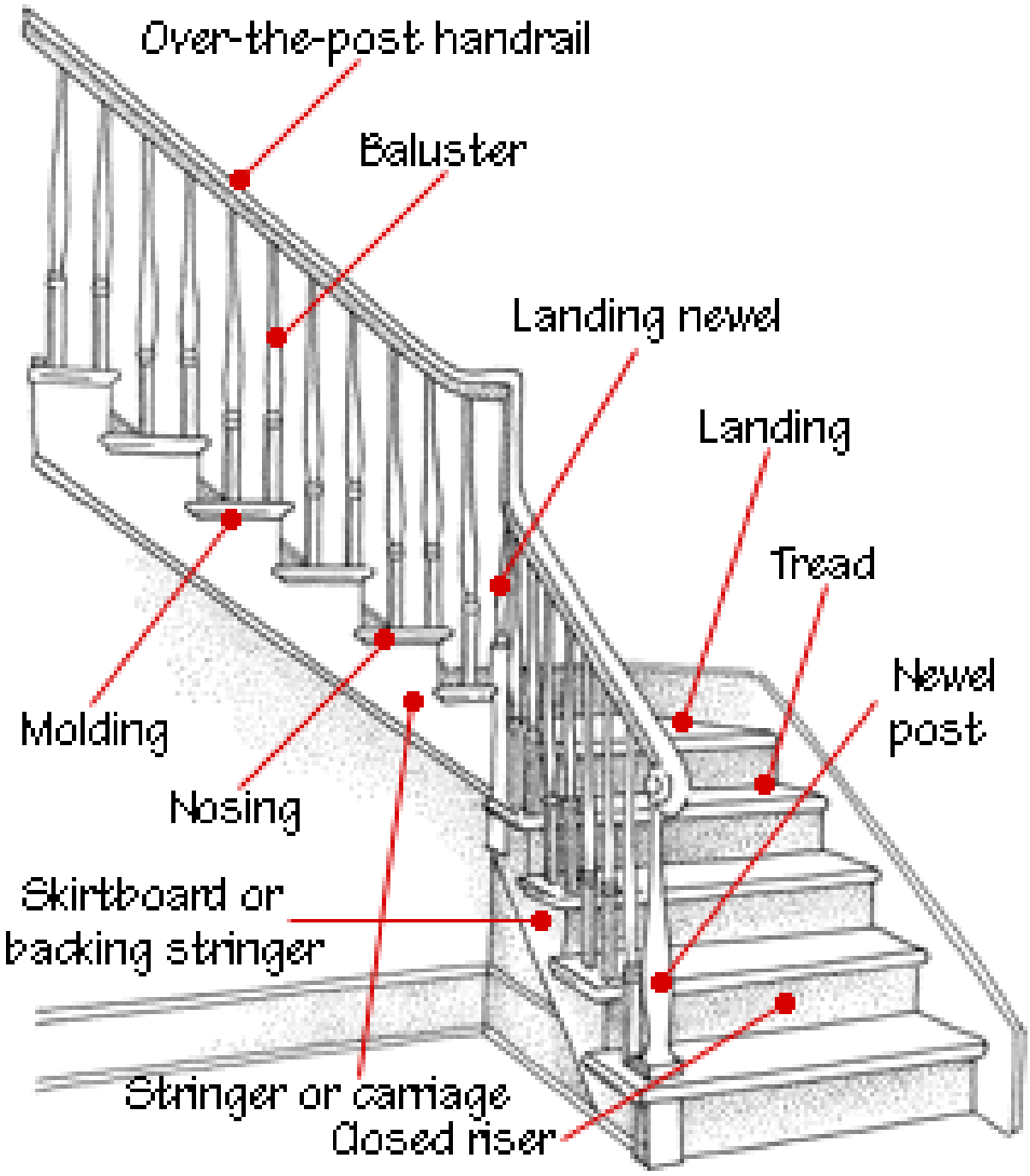
Psychometric Chart



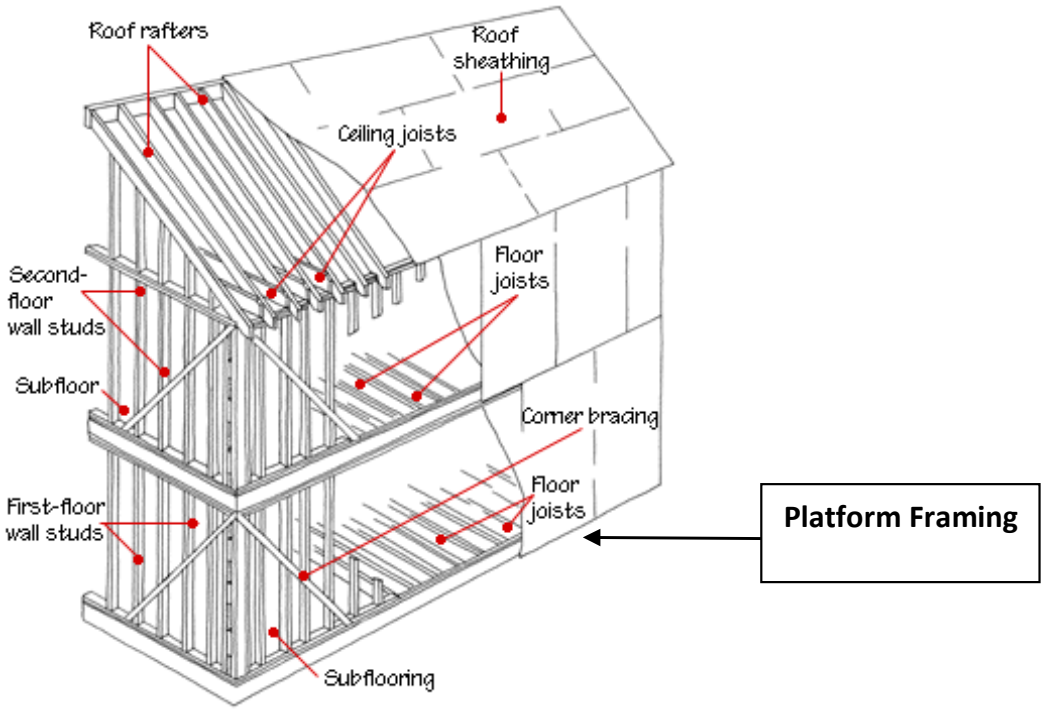
Subarctic/Artic Illustration

Vegetative Roof Illustration - Cross Section View

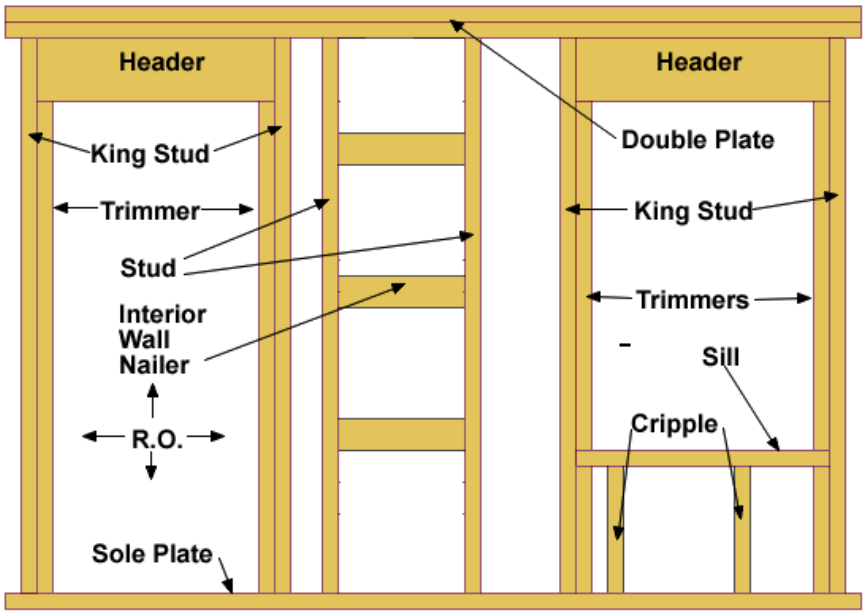
Stairs


Over-the-post handrail
Baluster
Landing newel
Landing
Tread
Newel post
Molding
Nosing
Skirtboard or backing stringer
Stringer or carriage
Closed riser

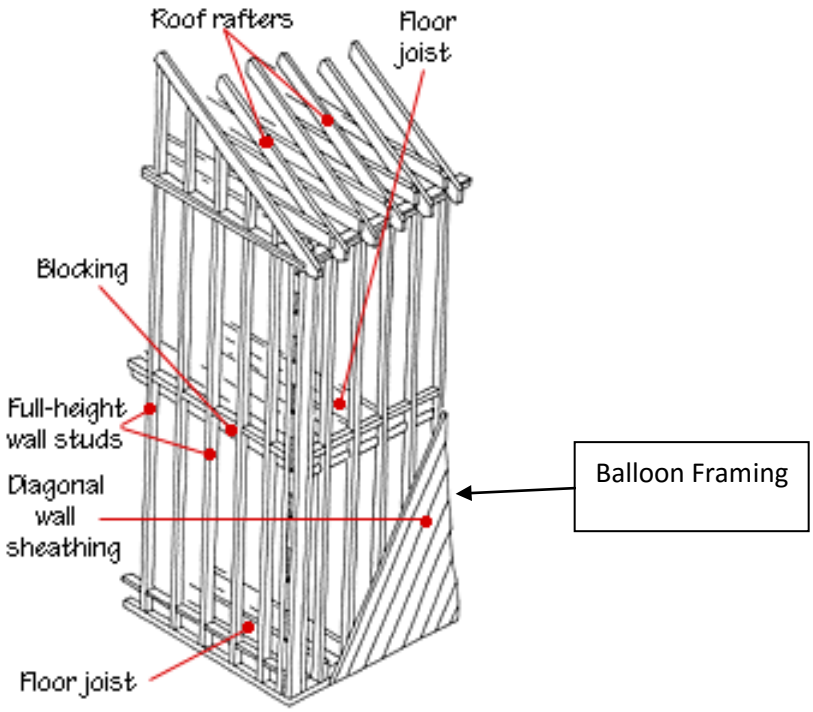
Exterior wall framing – Wood



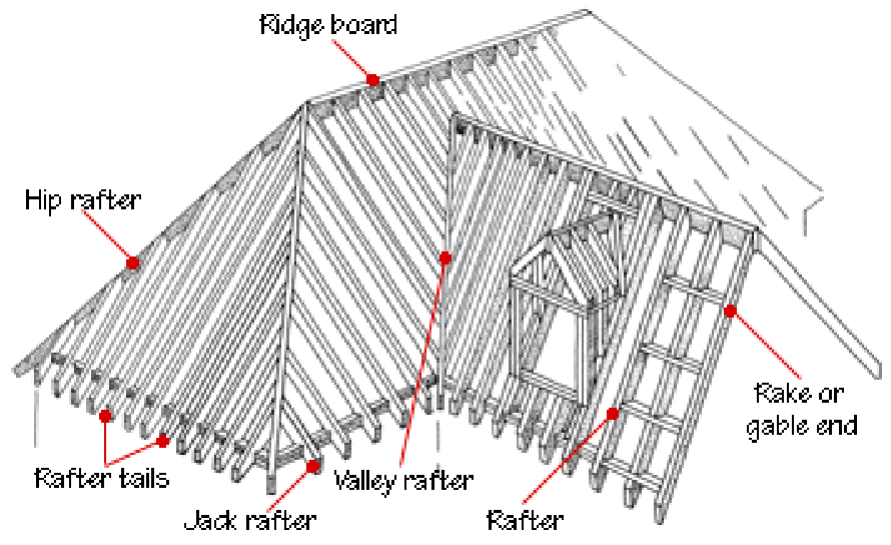
Typical Wall Framing – Wood



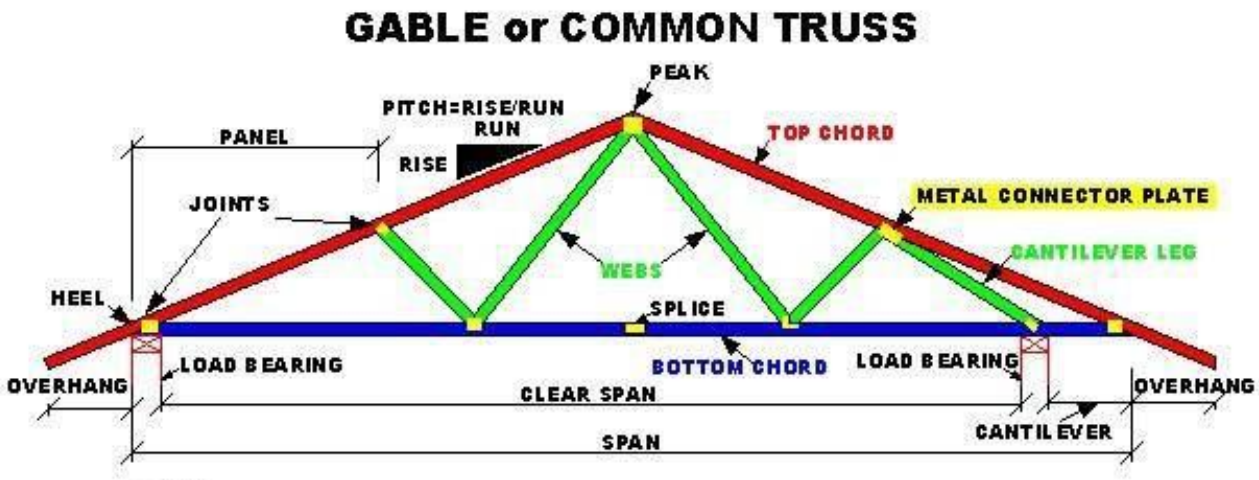
Exterior wall framing – Wood



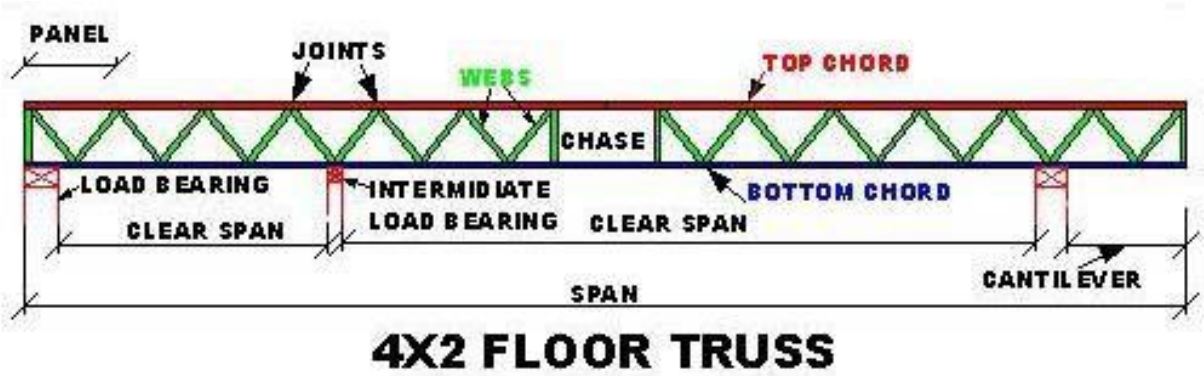
Roof framing – Structure



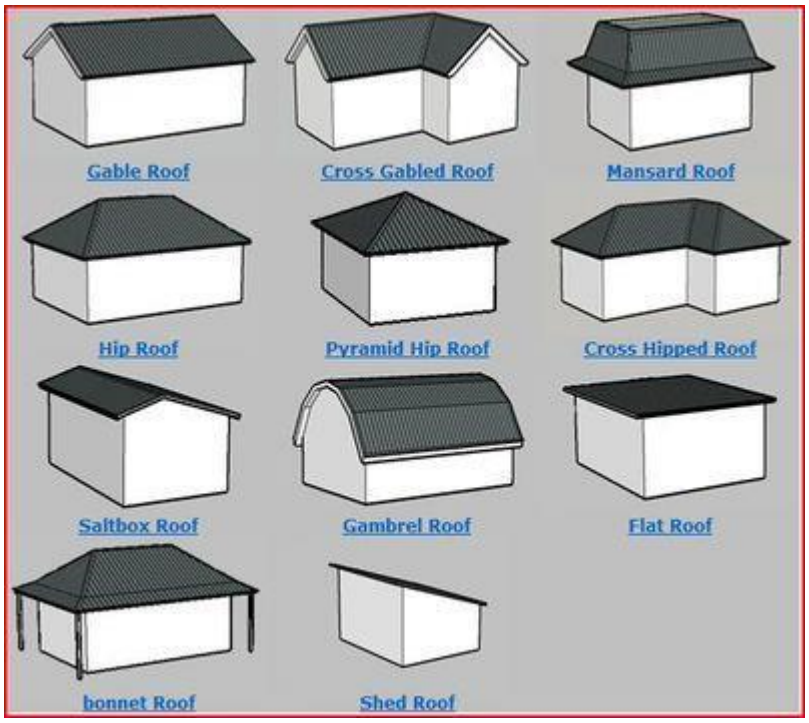
Engineered Truss – Roof



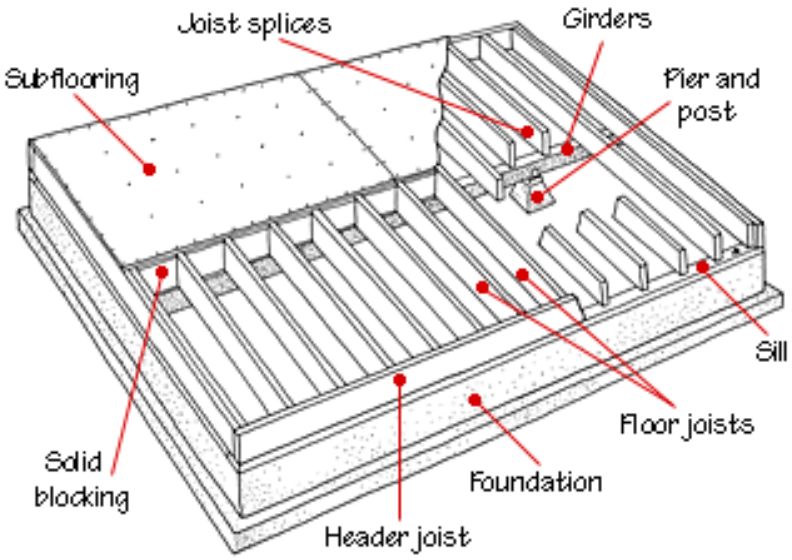
Engineered Floor Truss



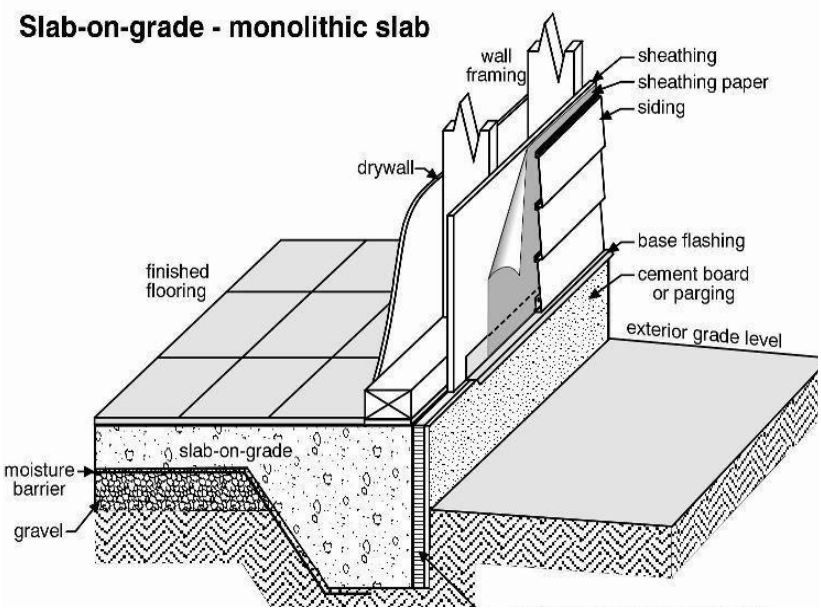
Roof Styles



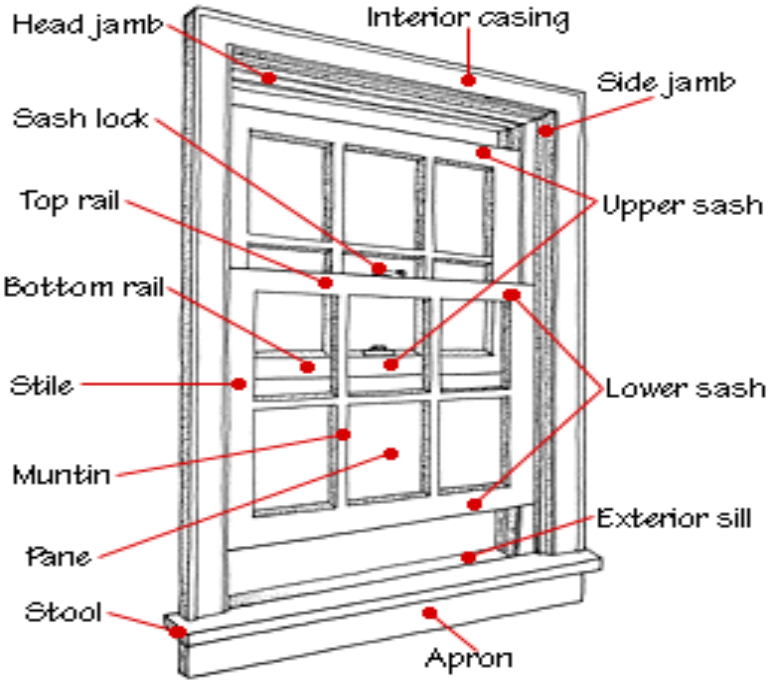
Floor Structural Components



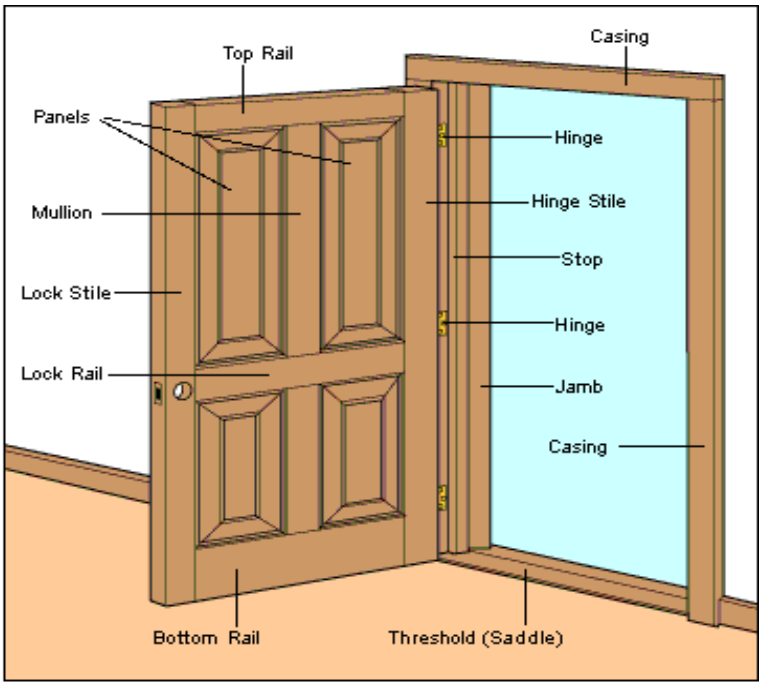
Monolithic Slab on Grade



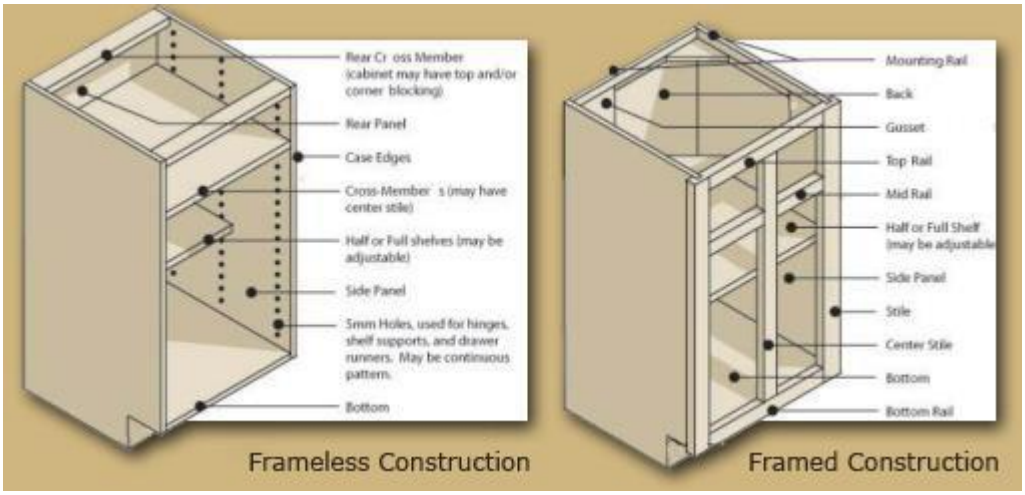
Window Illustration



Door Illustration



Cabinet Illustration



APPENDIX D: Furniture

Content Identification: Classification
Antique: any work of art, piece of furniture, decorative object, or the like, created or produced in a former period, or, according to U.S. customs laws, 100 years before date of purchase.
http://dictionary.reference.com/browse/antique

Period: Furniture that was made during a particular period in time
http://www.collinsdictionary.com/dictionary/english/period-furniture
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http://www.ehow.com/list_7233092_characteristics-victorian-furniture.html#ixzz2WV0vsBFs

http://www.google.com/imgres?imgurl=&imgrefurl=http%3A%2F%2Fwww.myhomestyle.org%2Fvictorian- chairs-the-perfect-touch%2F&h=0&w=0&sz=1&tbnid=eqwIFW- fxoTaoM&tbnh=194&tbnw=259&zoom=1&docid=IHC234GgXfhL9M&ei=-F1i_UcCWDtXI4AOe34CgAg&ved=0CAg QsCU

http://www.bing.com/images/search?q=Free+architectural+images+of+mission+chairs&qs=ds&form=QBIR - view=detail&id=0723B-7CC8D11160556ECCF00F0324C98B286E36A1&selectedIndex=26

http://www.claybornesamishfurniture.com/html/mission_end.html

https://www.google.com/search?q=early+american+style+tables&rlz=1T4GZAG_enUS427US429&tbm=isch&tbo=u&source=univ&sa=X&ei=uVy_UcrLNpTI4APbroGAAQ&ved=0CDkQsAQ&biw=1492&bih=720#facrc=_&imgrc=7lX8XNDJInbhtM%3A%3BaiC6fyuZvzZF8M%3Bhttp%253A%252F%252Ftomsworkbench.com%252Fwpcontent%252Fuploads%252F2010%252F04%252FCraigstable.jpg%3Bhttp%253A%252F%252Ftomsworkbench.com%252F2010%252F04%252F19%252Fwoodworking- spotlight-craig-bentzley%252F%3B1536%3B1024

https://www.google.com/search?q=Louis+XV+furniture+styles&rlz=1T4GZAG_enUS427US429&tbm=isch&tbo=u&source=univ&sa=X&ei=cGa_UdvEIzj4AORwIC4Dw&ved=0CE0QsAQ&biw=1492&bih=720#facrc=_&imgrc=GZwVRNo8Pi3pyM%3A%3BLIcqddKPZY2w8M%3Bhttp%253A%252F%252Fwww.soustelleartadvisory.com%252Fimages%252Farticles%252FlouisStyleLa diesDesk.gif%3Bhttp%253A%252F%252Fwww.soustelleartadvisory.com%252Farticles%252Flouis-style-case-furniture-in- 19th-century-paris.html%3B292%3B398

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http://styles-and-periods.interiordezine.com/furniture-history/william-and-mary

http://www.museumfurniture.com/georgian/#8candelabra1

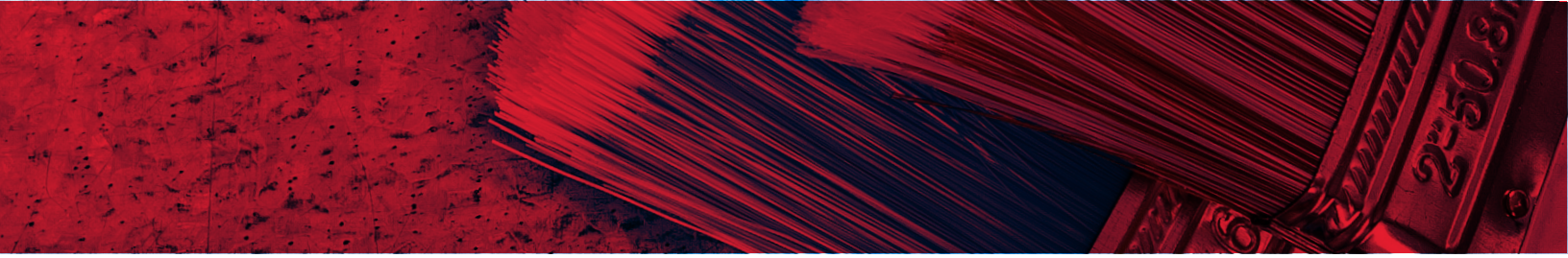
http://styles-and-periods.interiordezine.com/furniture-history/sheraton-furniture

http://www.buzzle.com/articles/federal-style-furniture.html

http://www.worthpoint.com/blog-entry/collecting-federal-furniture

APPENDIX D: Furniture

Dates	British Monarch	British Period	American Period	Style
1558-1603	Elizabeth I	Elizabethan	Early Colonial	Gothic
1603-1625	James I	Jacobean		Baroque (c. 1620-1700)
1625-1649	Charles I	Carolean		
1649-1660	Commonwealth	Cromwellian		
1660-1685	Charles II	Restoration		
1685-1688	James II	Restoration		
1688-1694	William & Mary	William & Mary	William & Mary	
1694-1702	William III	William III	Dutch Colonial	Rococo (c. 1695-1760)
1702-1714	Anne	Queen Anne	Queen Anne	
1714-1727	George I	Early Georgian		
1727-1760	George II	Georgian	Chippendale (c. 1750)	
1760-1811	George III	Georgian	Early Federal (c. 1790-1810) American Directoire (c. 1798-1804) American Empire (c. 1804-1815)	Neo-classical (c. 1755-1805) Empire (c. 1799-1815)
1812-1820	George III	Regency	Later Federal (c. 1810-1830)	Regency (c. 1812-1830) Eclectic (c. 1830-1880) Arts & Crafts (c. 1880-1900)
1820-1830	George IV	Regency		
1830-1837	William IV	William IV		
1837-1901	Victoria	Victorian	Victorian	
1901-1910	Edward VII	Edwardian	Art Nouveau (c. 1890-1920)	Art Nouveau (c. 1890-1920)
1910-1936	George V		Art Deco (c. 1920-1939)	Art Deco (c. 1925-1939)
1936	Edward VIII			
1936-1952	George IV			
1952-	Elizabeth II			
1920-1940				International Modern
1950-1960				Danish Modern
1970 – 1980				Vintage Retro
1990-2010				High-Tech



APPENDIX D: Furniture

Natural: Natural fibers are made from plant, animal and mineral sources. Natural fibers can be classified according to their origin.

Cane

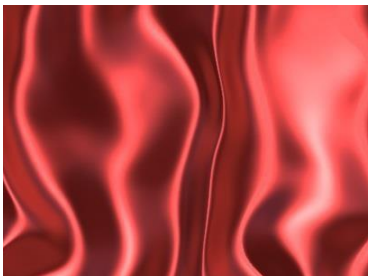
Rush

Wool

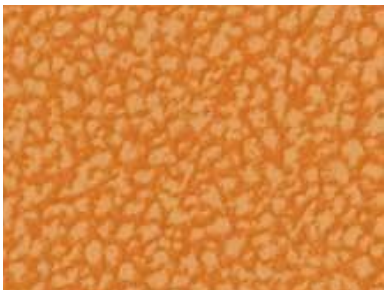
Cotton

Reference: Synthetic (http://en.wikipedia.org/wiki/Synthetic_fabric)

Silk



Leather



Synthetic fabrics are textiles made from synthetic fibers. They are used primarily to make clothing. A synthetic fabric is plastic fabric. Some of the examples of synthetic clothing were usually made of polyester, acrylic, and nylon. A synthetic fiber, when magnified, looks like plastic spun together. Man-made fabrics, also known as synthetic fabrics include fabrics such as rayon, acetate, nylon, acrylic, polyester, olefin, spandex, latex and kevlar. These fabrics have many different uses and qualities, some which, cannot be achieved with natural fibers. With synthetic fibers one can create waterproof fabrics and fabrics with an excellent amount of stretch used for swimwear and lingerie.

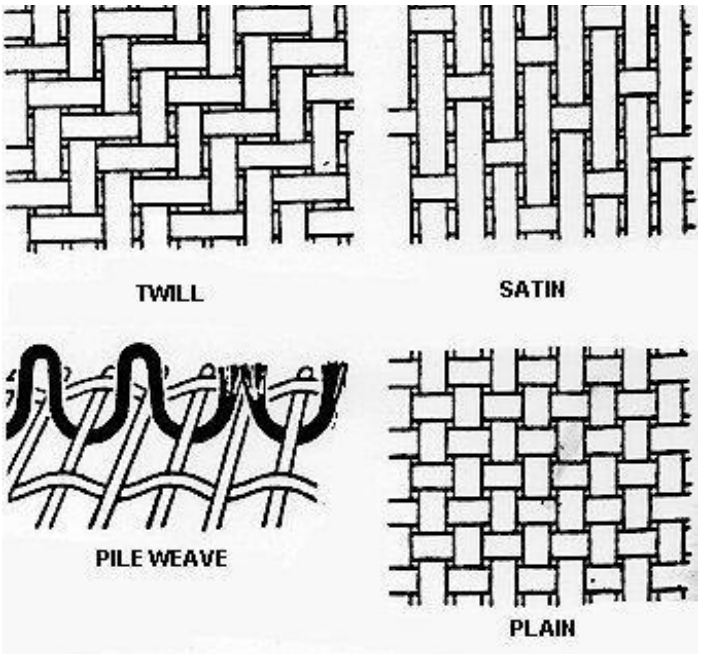
The fabric is made from chemically produced fibers. The chemicals used to make the fibers are sodium hydroxide and carbon di-sulphide, which are derived from coal, oil, or natural gas. The chemicals are in liquid form and are forced through tiny holes called spinnerets. As the liquid comes out of the spinnerets and into the air, it cools and forms into tiny threads. Dyes are added to these threads before they are woven together to make the fabric.

Depending on the fabric, other chemicals are added to make the fabric softer, wrinkle free, flame-resistant, water resistant, stain-resistant, and moth-repellant.

While all these qualities are desirable, they can have harmful effects on the environment, wildlife and our health, especially for those who work to produce the fabrics. The chemicals leach out into the waterways, airways and pollute the ground, water and even the air we breathe. Also, these fabrics are non-biodegradable, which means they do not breakdown in the soil.

APPENDIX D: Furniture

Weaves

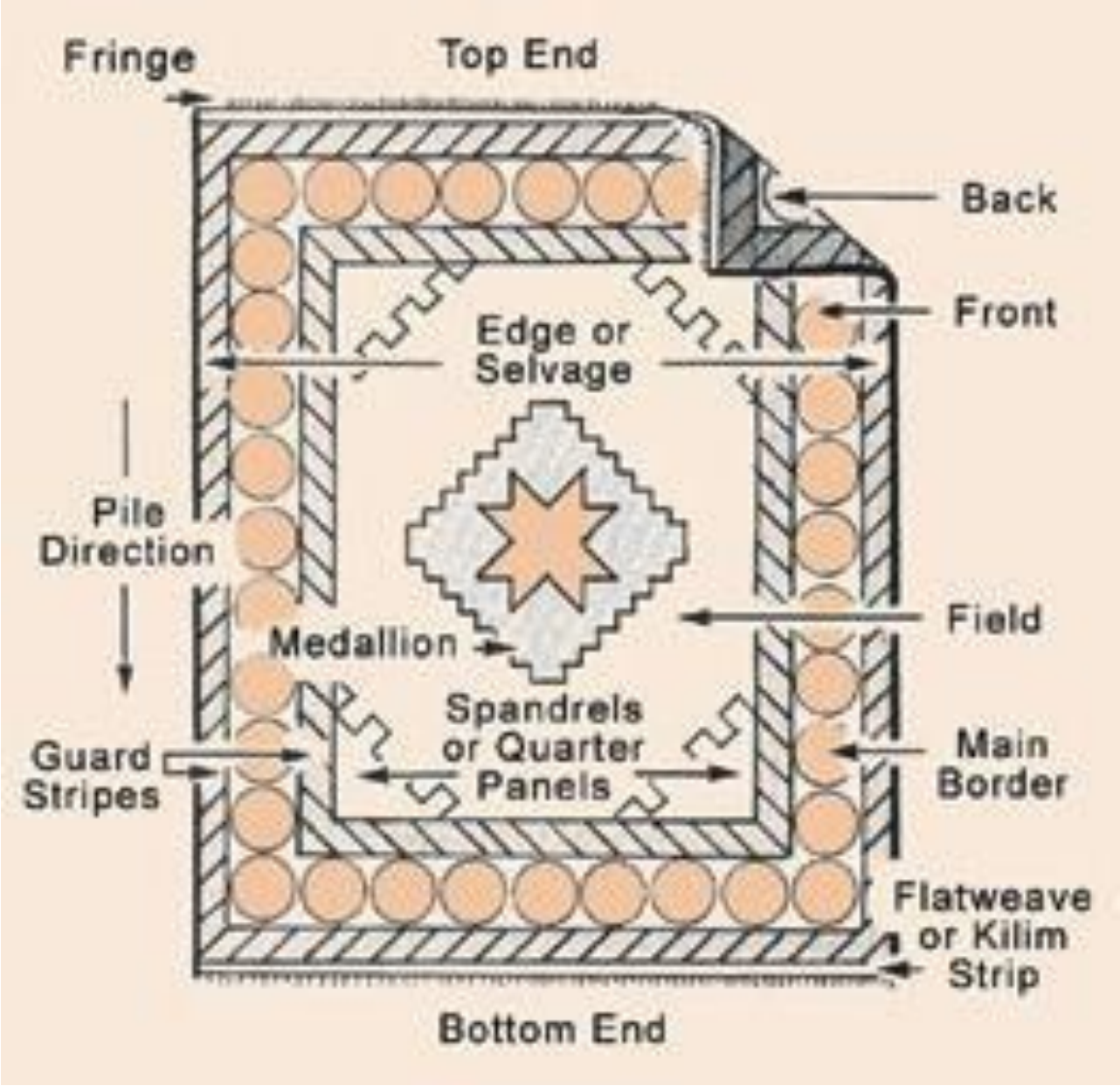


Jacquard

APPENDIX D: Furniture

Floor Coverings: Specialty Rug Samples

Oriental Rug



APPENDIX D: Furniture

Navajo Rug

APPENDIX D: Furniture

Domestic

Reference:
Restoration Industry Association, 2013. Certified Restorer Advanced Certification Course Manual and Study Guide. Section 4: Contents, 181 – 252. Restoration Industry Association.

Management Knowledge

Business Management

- Risk Management
  - ☐ Contracts
  - ☐ Legal documents
  - ☐ Government regulations
- Finance and Accounting
  - ☐ Cash flow
  - ☐ Line of credit
- Marketing and Sales
- HR services and policies

Project Management

- Definition and Planning
  - ☐ Identification and assessment of needs
    - Initial damage assessment
      - ○ Triage
        - ✦ Subrogation
        - ✦ Loss severity
        - ✦ Loss type
      - ○ Situational criteria
        - ✦ Health and safety and environment
        - ✦ Limitations
        - ✦ Competence and capacity
    - Stakeholders
      - ○ Direct level
        - ✦ Contractor
        - ✦ Policyholder
          - ♦ Agent of record
            - › Property manager
            - › Public adjuster
            - › Legal representative
        - ✦ Insurer
          - ♦ Insurance agent/broker
          - ♦ Insurance adjuster
            - › Staff adjuster
            - › Independent adjuster
          - ♦ Third party administrator
            - › Licensed
        - ✦ Neighbors
        - ✦ Insured's customers
        - ✦ Tenants
        - ✦ Community at large

- Objectives
  - Safety
  - Schedule/Time
  - Quality
  - Financial
  - Estimating
- Detailed damage assessment
  - Comprehensive inspection/observation
  - Work breakdown
- Estimate types
  - Firm-fixed price
  - Cost reimbursement
    - Time and materials
    - Cost-plus
  - Unit price
- Estimating process
  - Quantity take-off
    - Formulas
    - Measurement and counts
  - Costing
    - Data sources
    - Direct costs
    - Indirect costs
  - Pricing
    - Internal profitability requirements
    - External risk and market conditions
  - Formatting
    - Carrier or adjuster requirements
    - Owner requirements
      - Initial documentation
- Contractual
  - Work authorization
  - Assignment of benefits
  - Payment schedule
  - Liability release
  - Informed consent
  - Chain of Custody
  - Federal, State, Local, Provincial
  - Healthcare
    - HIPPA
    - ICRA
    - JCAHO-EOC 2.6
    - NFPA Life Safety Code 101
  - Permits and notices
    - Building permit

- Pre-lien notices
- Operational
  - Personal property
    - Disclaimers
    - Waivers
  - Audio/visual record
    - Video
    - Images
      - Film
      - Digital
    - Voice
  - Building/site information
    - Map
    - HOT BOOK / RED BOOK
    - Job profile
    - Record drawings (As Builts)
    - Building information modeling
    - Engineering reports
  - Schedule development
    - Scheduling Documents
    - Apps and software
    - Critical Path Method
  - Estimate development
    - Draft
    - Approved
  - Communication means and media
    - Face-to-face
    - Health and safety
    - Walk through and site inspection
  - Meetings
- Electronic
  - Web-based
    - Email
    - Web-cam
    - Management systems
  - Wireless
    - Cell phone
    - Tablet
    - Multi-media messaging
    - Radio
- Hard copy
  - Writing
  - Graphics
    - Sketches
    - Diagrams

- Execution
  - ☐ Project resources
    - Labor
      - Skilled trade
      - Restoration technicians
      - General labor
      - Restoration supervisor
    - Materials☐
    - Equipment☐
    - Consultants☐
      - Building Systems
      - Contents
      - Specialized Consultants
  - ☐ Monitoring and control
    - Site safety☐
      - OSHA Safety Standard 29CFR1910
      - OSHA Safety Standard 29CFR1926
    - Schedule☐
    - Budget☐
      - Job-cost auditing
      - Forecast
    - Quality and assurance☐
    - Emerging complications☐
  - ☐ Working documentation
    - Contractual☐
      - Change orders
        - ✦ Supplements
        - ✦ Upgrades
        - ✦ Credits
      - Submittals / Customer selections
      - Subcontracts
      - Notifications
      - Work orders
    - Regulatory
      - Municipal
      - State
      - Federal
    - Operational☐
      - Labor
        - ✦ Sign-in log
        - ✦ Time cards
      - Materials
        - ✦ Requisitions
        - ✦ Purchase orders
        - ✦ Vendor invoices

- Equipment inventory and use
  - Daily dispatch log
  - Equipment Maintenance log
- Job monitoring
  - Communication logs
  - Schedule status
  - Budget status
  - Revised estimate
- Recurring reports
  - Daily site
  - Production
  - In-progress images

- Close-Out
  - ☐ Final inspection
    - Client or Policy Holder☐
    - Insurance carrier☐
    - Municipality☐
    - Mortgage company☐
  - ☐ Final documentation
    - Contractual☐
      - Pre-final inspection punch list
      - Warranties
        - Manufacturer and product manuals
        - Workmanship
      - Mortgage release
      - Project Completion
        - Certificate
        - Survey
        - Authorization to pay
    - Regulatory☐
      - Municipal
        - Certificate of occupancy
      - State
        - Notice of substantial completion
        - Lien waivers
      - Federal
        - Offsets and tax incentives
        - Hazardous Materials Bill of Lading
    - Operational☐
      - Record of correspondence and transmittals
      - Completion images
      - Final pay invoices/receipts
        - Vendors
        - Subs

- Job cost analysis
- Final estimate
- Personal property
  - Inventory at turnover
  - Updated disposal authorization

APPENDIX E: Management Knowledge References

Business Management
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FIFRA, http://www.epa.gov/pesticides/regulating/laws.htm

Safety Data Sheet (SDS): http://en.wikipedia.org/wiki/Material_safety_data_sheet

AHA / JHA - OSHA 3071, Activity Hazards Analysis, www.usace.army.mil › Safety and Occupational Health, Job Hazards Analysis, https:www.osha.gov Publications osha30 1.pdf

Health Insurance Portability and Accountability Act (HIPAA) http://www.dhcs.ca.gov/formsandpubs/laws/hipaa/Pages/default.aspx

Infection Control Risk Assessment (ICRA) https://www.premierinc.com/quality-safety/tools-services/safety/topics/construction/icra.jsp

Health Insurance Portability and Accountability Act (HIPAA) http://www.dhcs.ca.gov/formsandpubs/laws/hipaa/Pages/default.aspx

The Joint Commission - Environment of Care: http://www.jointcommission.org/topics/hai_environment_of_care.aspx

Infection Prevention and Control Issues in the Environment of Care, Second Edition, 2009, 153 pages. http://store.jcrinc.com/infection-prevention-and-control-issues-in-the-environment-of-care-second-edition/

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Scientific Knowledge

Physics

- Thermodynamics
  - ☐ ☐Heat transfer mechanisms
    - Conduction☐
    - Convection☐
    - Radiation☐
  - ☐ ☐Psychrometry
    - Relative Humidity☐
    - Dry and atmospheric air☐
    - Specific humidity, absolute humidity, humidity ratio☐
    - Dew point temperature☐
    - Adiabatic saturation and wet-bulb temps☐
    - Enthalpy: sensible and latent heat☐
    - Psychrometric chart☐
    - Vapor pressure, hydrodynamic and thermal boundary layers☐
    - Evaporation and condensation ☐
    - Equilibrium Moisture Content☐
    - Mass / Volume☐
  - ☐ ☐Laws of thermodynamics
    - Conservation of energy☐
    - Entropy☐
  - ☐ Inspection Monitoring Equipment
- Fluid mechanics
  - ☐ ☐Basics
    - Unit density, specific weight/volume/gravity☐
    - Vapor pressure☐
    - Capillarity☐
  - ☐ ☐Statics
    - Absolute and gauge pressures☐
    - Manometry☐
    - Buoyancy and flotation☐
  - ☐ ☐Kinematics
    - Conservation of mass (continuity)☐
    - Conservation of energy (Bernoulli)☐
  - ☐ ☐Real flows
    - Laminar and turbulent flows☐
    - Boundary layers☐
    - Pipe flow☐
    - Open channel flow☐
    - Pump characteristics☐
- Nuclear
  - ☐ ☐Medical and industrial so

- Pump Characteristics

☐ Sources of radiation
- Radiation characteristics☐

☐ Nuclear☐
- Medical and Industrial sources of radiation☐
    - Radiation Characteristics☐
        - Alphas
        - Betas
        - Gammas
        - Intensities and half lives
- Common nuclear process wastes
    - Medicine
    - Power

☐ Biological effects of radiation
- Adverse☐
    - Somatic
    - Genetic
- Radiation exposure standards☐

- Electricity

☐ Basic principles
- Voltage, current, resistance, power☐
- Ohm's Law E=IxR☐
- Joule's Law P=ExI☐
- Kirchoff's Law: The sum of the currents flowing into any node of an electrical circuit must equal the sum of the currents flowing out of that node: ☐Iin = ☐Iout , where I is the quantity of electrical current.☐
- Series, parallel, and series-parallel circuits☐
- AC vs DC electricity☐
- Waste heat☐

- Chemistry

- Cleaning agents

☐ Dry side
- Volatile dry solvents (VDS)☐
- Non-volatile dry solvents (NVDS)☐

☐ Wet side
- Water-based solvents☐
    - pH
    - Neutral agents
    - Alkaline agents
    - Acid agents

☐ Digesters-biologicals
- Biologicals☐

☐ Rust removers
- Hydrofluoric acid☐
- Oxalic acid☐

- Reducing agents
  - Sodium bisulfite
- Oxidizing agents
  - Hydrogen peroxide
  - Sodium hypochlorite

- Anti-microbials
  - Sanitizers
  - Disinfectants
  - Sterilizers
    - Sporicides
  - Growth Inhibitors
    - Bacteriostats
    - Fungastats

- Biocides (aka Antimicrobials)
  - Fungacides
  - Pesticides

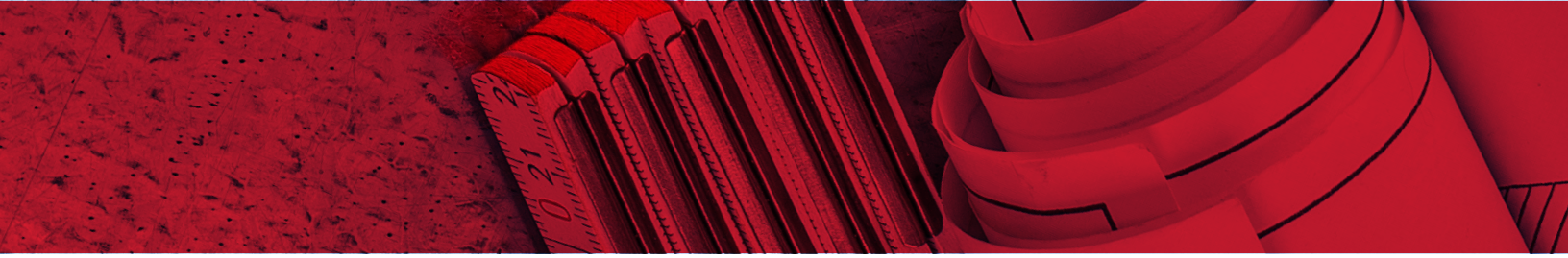
- Gas phase oxidation
  - Ozone
  - Hydroxyl

- Biology

- Arthropods
  - Pests
    - Skunk
    - Squirrel
  - Parasites
    - Amoeba
    - Lice
    - Bed Bugs
    - Ring worms

- Microbiology
  - Blood-borne pathogens
    - Hepatitis A
    - Hepatitis B
    - Hepatitis C
    - HIV
  - Bacteria
    - Escherica coli
    - Salmonella
    - Shigella
    - Pseudomonas
  - Viruses
    - Adenovirus
    - Rotovirus

    - G.I. Virus
- ☐ Fungi
    - Stachybotrys
    - Penicillium
    - Aspergillus
    - Chaetomium
- Insects
- Respirable particles
- Gases
- Dusts



APPENDIX F: Scientific Knowledge: Physics Formulas

Thermodynamics
Heat transfer mechanisms. No formulas.
Useful constants associated with heat transfer to and from water:
Heat of vaporization of water at 1-atmosphere pressure is 540-calories/gram. That much heat must be added to water at 100o C = 212o F in order to vaporize it to steam, even though the temperature does not increase through the liquid-to-gas phase change.
Heat of fusion of water at 1-atmosphere pressure is 80-calories/gram. That much heat must be drawn from water at 0o C = 32o F in order to solidify it to ice, even though the temperature does not decrease through the liquid-to-solid phase change.
B. Psychrometry. Also see Technical Knowledge: Restorative Drying

H = U + pV
total energy, enthalpy = internal energy
+ work done expanding to equilibrium against ambient pressure

C. Laws of thermodynamics

1. First Law of Thermodynamics. Energy is conserved in thermodynamic systems.
□U = Q – W
change in system internal energy = system heat – system work

2. Second Law of Thermodynamics. Heat cannot move from colder to warmer regions, or from more disorder to less disorder, without some external action.
Q = T □S
change in system heat = system equilibrium temperature x change in system entropy

II. Fluid Mechanics (fluids are liquids and gasses)

A. Basics

1. Unit density, □ At a given temperature, a material's mass per unit volume, which remains constant for the material throughout the universe, no matter the pull of gravity.

2. Specific weight, □= □x g. A material's weight per unit volume, where weight is the mass times the acceleration of gravity, g = 32.2-feet/second2 (ft/sec2), a value that changes with fluctuations in gravitational attraction. Example: the specific weight of water is 62.4-pounds/cubic foot (lb/ft3 or pcf) on Earth, although even here it changes slightly from place to place; we tend to ignore the small changes in g for most purposes.

3. Specific volume, □= 1 □ At a given temperature, the ratio of the volume of a material to its mass; the reciprocal of the unit density.

4. Specific gravity. At a given temperature, the ratio of the density of material to the density of water, which is 62.4-pounds/cubic foot or 62.4-pcf. Example: steel is commonly assigned a specific weight for engineering calculations on Earth of 490-pcf; steel's specific gravity is then 490-pcf/62.4-pcf = 7.85.

B. Statics.
1. Absolute pressure, pabs. The pressure within a system or container compared to a perfect vacuum. Atmospheric pressure is expressed in absolute terms, commonly in inches of mercury, inHg. Since mercury, chemical symbol Hg, is 13.5 times as dense as water, a 1.0-in depth of Hg exerts 0.491-lb/in2 (psi).

2. Gauge pressure, pga = pabs - patm. The pressure within a system or container compared to the local ambient pressure. Tire inflation pressure is expressed as a gauge pressure, showing the difference in pressure between the atmosphere and the absolute air pressure in the tire. Pressures displayed for systems in restoration or construction equipment are usually gauge pressures, showing zero-units of pressure when not operating, even though the system experiences atmospheric pressure, which is 14.7-psi (at sea level, 20oC = 68oF, and 20% RH) = 760-mm Hg = 29.9-inHg.

3. Manometry. The use of a manometer to measure vapor pressure in a system or container. A manometer commonly measures the movement of a fluid in a standing tube, which is open to air pressures in adjacent regions, such as restoration containment and the ambient air. The fluid is usually water, but mercury is also used. With changing pressure, the fluid in the tube is forced to move with or against gravity, depending on a pressure decrease or increase. The fluid movement is measured to find the changed pressure.

4. Buoyancy. The weight of water displaced by a submerged or partially submerged body reduces the effective weight of the body by the weight of displaced water.

C. Kinematics

1. Conservation of mass (continuity equation). min = mout + s
mass flowing in = mass flowing out + storage of mass in the apparatus

2. Conservation of energy (Bernoulli equation, along a streamline). (p1 □) + (v1 /2) + (g x h1) = (p2 □) + (v2 /2) + (g x h2)
(pressure head + velocity head + elevation head) at point 1 on a streamline
= (pressure head + velocity head + elevation) at point 2 on that streamline

III. Nuclear. No formulas.

IV. Electricity

A. Ohm's Law.
E = I x R
electromotive force (volts) = current (amperes) x resistance (ohms)

APPENDIX F: Scientific Knowledge: Physics Formulas

B. Joule's Law.

P = E x I
watts = volts x amperes

Kirchoff's Circuit Law. Sum of currents in = sum of currents out:
currents flowing into the node = □currents flowing out of the node

C. Appliance heat generation.

See Technical Knowledge for formula applied t drying apparatus.

APPENDIX G: Scientific Knowledge: References

Scientific Knowledge: Physics
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Ohm's Law: http://www.autoshop101.com/trainmodules/elec_circuits/circ108.html (accessed 3Jan13)

Joules' Law: http://www.britannica.com/EBchecked/topic/306638/Joules-law (accessed 3Jan13)

If including Kirchoff's Law [sum of current(s) into a node = sum of current(s) out of a node]: http://www.electronics-tutorials.ws/dccircuits/dcp_4.html (accessed 3Jan13)

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Occupational Safety Hazards & Administration (OSHA), Standards for General Industry, 29 CFR part 1910. http://www.osha.gov/law-regs.html. (accessed 15March, 2013)

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Basics of FIFRA: https://www.epa.gov/enforcement/federal-insecticide-fungicide-and-rodenticide-act-fifra-and-federal-facilities#Basics

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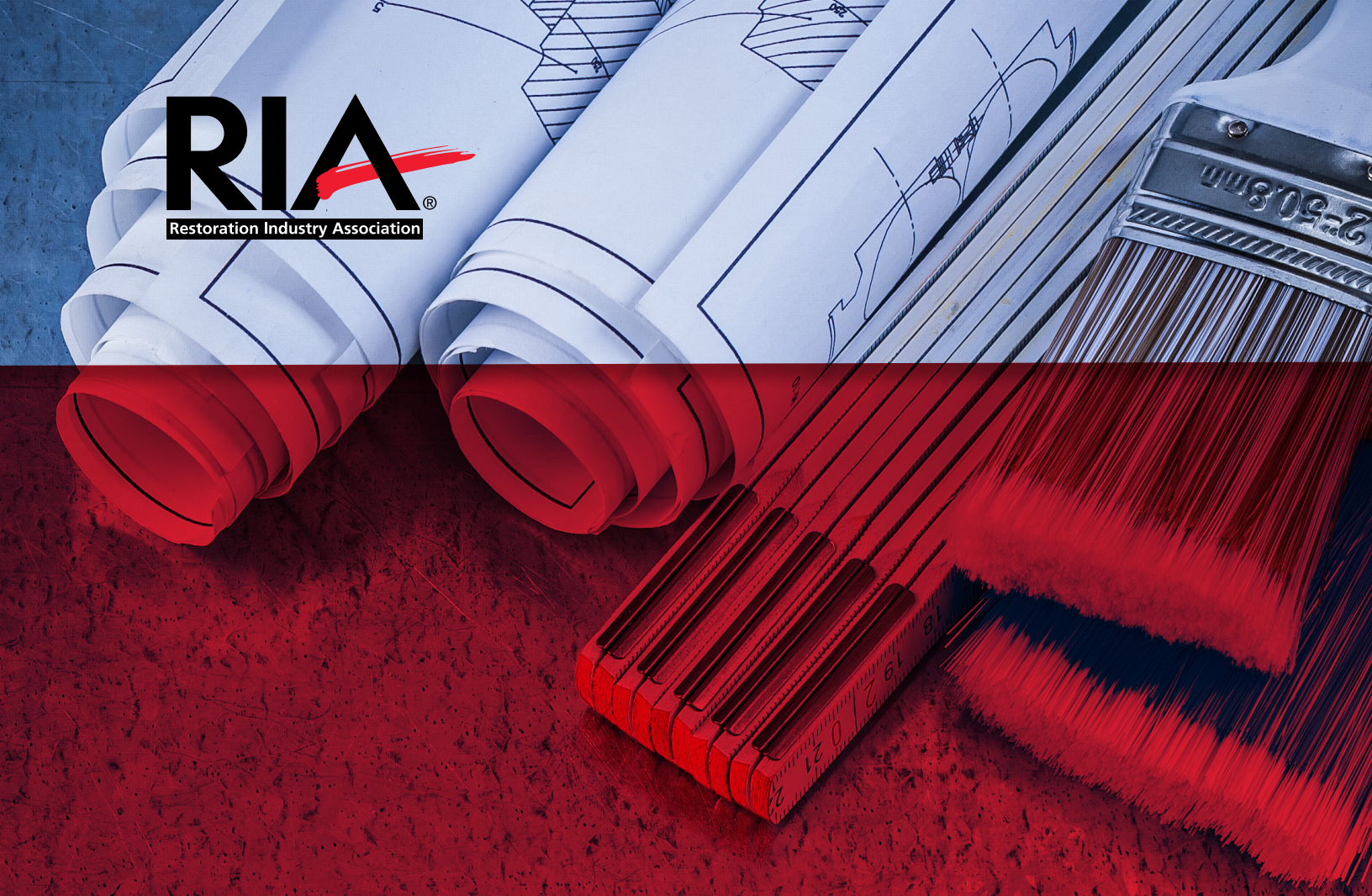
Additional Resources pending future publication.

RIA Guidelines for Fire and Smoke Damage Repair, Second Edition, http://restorationindustry.org



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