



# Strategies for Selection of Roofing Systems

CAA Seminar – Increasing Your Property Value  
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Making Buildings Perform Better

# Best Practice

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- **Education:** B.S., Civil Engineering, Santa Clara University
- **Registration:** P.E., Civil Engineering, California, Washington, Nevada, and Hawaii
- **Certification:** Registered Roof Consultant (RRC), Roof Consultants Institute, and Registered Waterproofing Consultant (RWC)



- **Overview:**
  - CEO and Senior Principal at Allana Buick & Bers.
  - Former Turner Construction Employee (Project Engineering and Superintendent)
  - Over 37 years experience providing superior technical standards in all aspects of building technology and energy efficiency.
  - Principal consultant in forensic investigations of building assemblies, failure analysis, evaluation and design of building infrastructure and building envelope evaluation and design.
  - Expert in all aspects of building envelope technology.
  - Completed numerous new construction, addition, rehabilitation, remodel and modernization projects for public and private sector clients.
  - Specialization in siding, roofing, cement plaster, wood, water intrusion damage, window assemblies, storefronts, below grade waterproofing, energy efficiency, solar engineering and complex building envelope and mechanical assemblies.

# ABBAE Firm Overview

- Allana Buick & Bers (ABBAE) is an Architectural Engineering firm specializing in Building Envelope Systems
- ABBAE is one of the 5 largest building envelope consultants in the country
- ABBAE has over 33 years of experience & over 12,500 projects
- ABBAE is also a leading Forensic Defect firm with hundreds of forensic projects (litigation)
- Locations – 16 offices across California, Nevada, North Carolina, Oklahoma, Oregon, Texas, Virginia, Washington, Colorado and Hawaii



# Staff & In-House Expertise

- Licensed Professional Engineers – Civil, Structural, and Mechanical
- Registered Architects
- Building Enclosure Commissioning Process Providers (BECxPs)
- Registered Building Envelope Consultant (RBEC)
- Registered Roofing Consultants (RRCs)
- Registered Waterproofing Consultants (RWCs)
- Registered Exterior Wall Consultant (REWCs)
- Registered Roof Observers (RROs)
- Certified Exterior Insulation and Finish System (EIFS) inspectors
- Curtain Wall Specialists
- ICC Certified Building Inspectors
- Quality Assurance Monitors
- Water Testing Experts
- Leak Investigation and Diagnosis Experts
- Infrared Imaging and Nuclear Moisture Scanning Experts

# ABBAE Building Expertise

- Building Envelope Systems

- Roofing Systems
  - High-Slope/Low-Slope Roofs
  - Green/Garden Roofs
  - Drainage Systems
  - Pedestrian Plazas
- Exterior Wall Systems
  - Wall Cladding/Siding/GFRC/pre-cast
  - EIFS/cement plaster/stucco
  - Sheet Metal Flashings
- Windows and Glazing Systems
  - Punched Windows
  - Curtain Wall/Window Wall Systems
  - Sliding Glass Doors
  - Skylights

- Building Envelope Systems (cont'd)

- Roofing & Waterproofing Systems
  - Deck/Balcony/Lanai Waterproofing
  - Podium Waterproofing
  - Pool/Spa Deck Waterproofing
  - Above-Grade/Below-Grade Waterproofing
  - All types of low and steep sloped roofing
- Commissioning BECx
  - OPR/BOD/Commissioning Plan
- Mechanical/HVAC Systems
  - HVAC design
  - Plumbing systems
  - Commissioning and testing



# ABBAE Core Services

- Consulting and third-party peer review services
- Engineer of record for building envelope systems
- Contract administration services
- Inspection services (usually direct with owner)
- Air and water performance testing
- Mock-up design, observation, and testing
- Building assessments and forensic investigations
- Litigation support and expert witness services
- Educational seminars with AIA credits





# Selecting Roof Membranes

- Every Project Manager has differing needs and requirements for the building and especially for the roof membrane
- There are a multitude of roofing systems from which to select:
  - Built Up (Hot and Cold Process)
  - Single Ply
  - Foam
  - Composition Shingle
  - Peel and Stick
  - Tile

# Built Up Roofs









*In built up roofs, bitumen is more than just adhesive – it should flow through pores in felt, to form a system.*



*Lack of brooming results in poor adhesion.*



# Tile Roofs





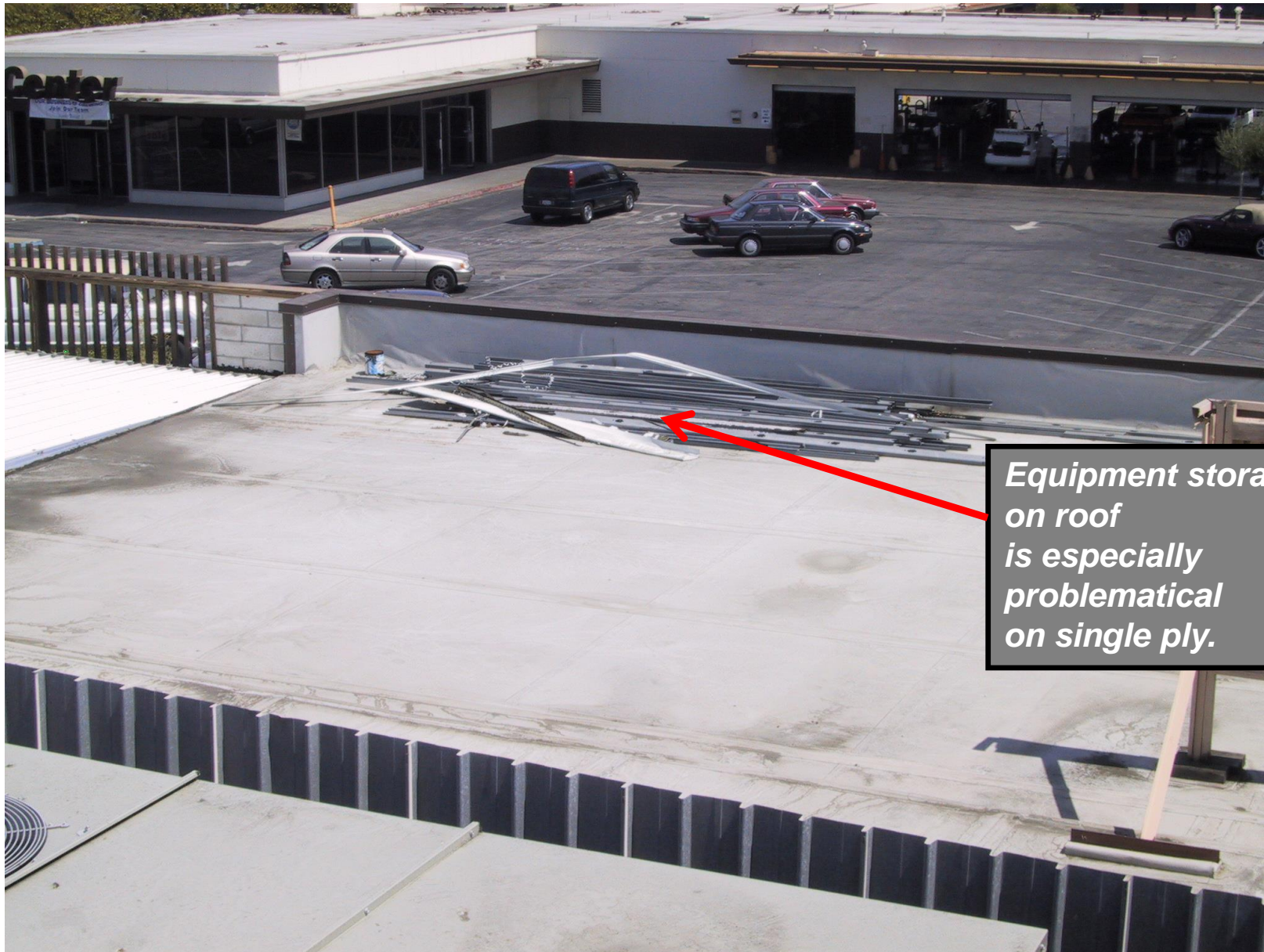




# Single Ply Roofs







*Equipment storage  
on roof  
is especially  
problematical  
on single ply.*























*An example of a pipe penetration system that was not designed properly.*



# Composition Shingles



# Peel and Stick





# Combination of Roof Types





# Economic Analysis

# Life Expectancies..

- Sealants: 10 to 25 years
- Painting: 5 to 7 years
- Hardboard siding: 25 years
- Roofs: 20 to 30 years
- Below Grade Waterproofing: Life of the building
- Windows: Life of the building
- Stucco: Life of the building

# LIFE CYCLE COSTING

To obtain the equivalent annual cost of a major expenditure, such as sealant replacement, you want to know the equivalent annual cost

Number of Years	Interest = 5%	Interest = 7%	Interest = 8%	Interest = 10%
4	0.2820	0.2952	0.3019	0.3155
15	0.0963	0.1095	0.1168	0.1315
20	0.0780	0.0944	0.1019	0.1175
30	0.0651	0.0806	0.0888	0.1061

Example: Assume a replacement cost for sealants of \$50,000

Assume Life Expectancy = 20 years

Assume Cost of money/interest = 5%

Life Cycle cost = \$50,000 x .0780 = \$3,900 per year

Compare that to: Yearly Maintenance Expense

Loss in Property Value

Cost of Continued Maintenance

Inability to turn around units



# Contractor Selection



# Contractor License Types

- “A” – General Engineering Contractor is licensed to design and build (although design build construction does not require an “A” license)
- “B” – General Building Contractor
- “C” – Specialty contractor, often is a subcontractor to an “A” or “B”

# Which license is needed and what are the limits?

- Specialty work such as roofing requires a C-39 license
- Only a C-39 Contractor or a licensed designer can design a roof
- Sealant repair requires no license and can be done in house with training and product literature
- Waterproofing repair, especially below grade, should be done by licensed and trained contractor only

# Prequalification Process for Contractors

- Compile a list of contractors before you need it
- Speak to your peers for lists of contractors they have found successful
- Check with state to determine if contractor has a license
- Make sure the contractor has a good reputation
- Know the difference between responsive and responsible
- Ask for copies of insurance certificates
- Check status of bond

# Selection Process

- Select a Contractor that offers more than one manufacturer's product
- Select a Contractor that is trained and certified in the product they are offering you
- Check previous projects and go through the pre-qualification process, if you have not already done so.
- Does the contractor have a reputation for:
  - Keeping schedule and contract terms.
  - Did the contractor perform satisfactorily?
  - Does the contractor listen to concerns and communicate?
  - How was the punchlist process?

# Four Common Types of Maintenance and Construction Contracts:

- Fixed Price Contracts
- Cost Reimbursement Contracts
- Unit Price Contracts
- Management Contracts