AUTHENTIC-ISH

Is That a Good Idea

A GUIDE TO
ALTERNATIVE MATERIALS

MICHAEL HOUSER

STATE ARCHITECTURAL HISTORIAN

dahp
protect the past. shape the future

DEPT OF ARCHAEOLOGY + HISTORIC PRESERVATION

IMPORTANT NOTE

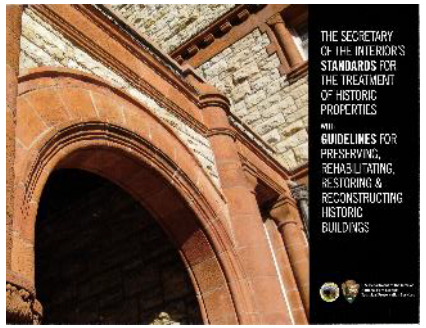
- Naming specific products does NOT signify endorsement or approval of that product by DAHP.
- Nor should the product named be considered “pre-approved” as an alternative material.
- It is the responsibility of the ___ to determine the suitability of the proposed product for the specific application.

A Preservation Approach

- Identify, Retain, and Preserve
- Protect and Maintain
- Repair
- Replace……

ALTERNATIVE MATERIALS

Secretary of the Interior Standard's



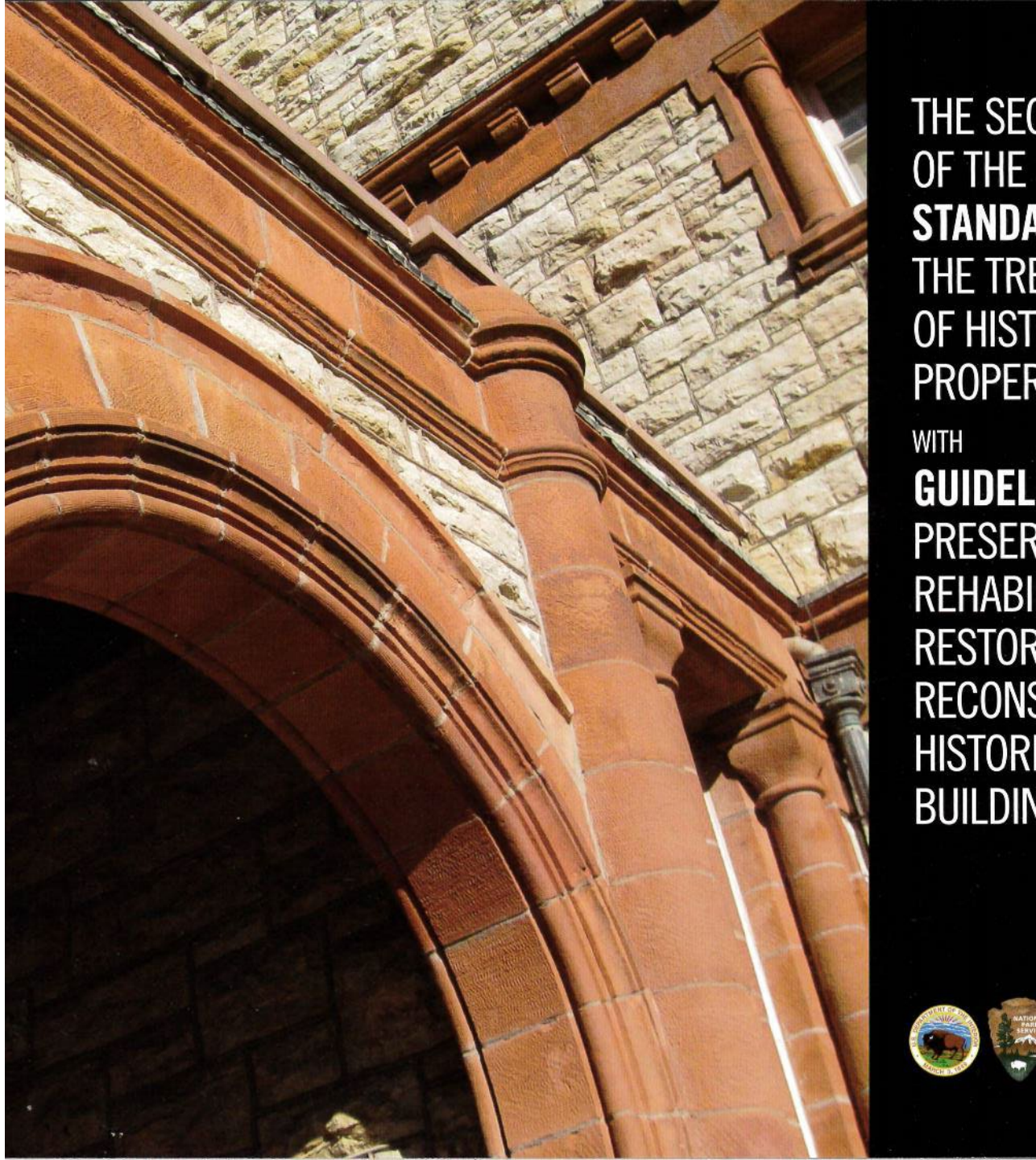
1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.
6. Deteriorated Historic Features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

ALTERNATIVE MATERIALS

Secretary of the Interior Standard's Standard #6

- Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and where possible materials.

  Replacement of missing features will be substantiated by documentary and physical evidence.



PRESERVATION BRIEF #16

Use of Substitute Materials

"… with proper planning, careful specifications and supervision, substitute materials can be used successfully in the process of restoring the visual appearance of historic resources."

16 PRESERVATION BRIEFS

The Use of Substitute Materials on Historic Building Exteriors

Sharon C. Park, AIA

U.S. Department of the Interior
National Park Service
Cultural Resources
Heritage Preservation Services

The Secretary of the Interior's *Standards for Rehabilitation* require that "deteriorated architectural features be repaired rather than replaced, wherever possible. In the event that replacement is necessary, the new material should match the material being replaced in composition, design, color, texture, and other visual properties." Substitute materials should be used only on a limited basis and only when they will match the appearance and general properties of the historic material and will not damage the historic resource.

Introduction

When deteriorated, damaged, or lost features of a historic building need repair or replacement, it is almost always best to use historic materials. In limited circumstances substitute materials that imitate historic materials may be used if the appearance and properties of the historic materials can be matched closely and no damage to the remaining historic fabric will result.

Great care must be taken if substitute materials are used on the exteriors of historic buildings. Ultra-violet light, moisture penetration behind joints, and stresses caused by changing temperatures can greatly impair the performance of substitute materials over time. Only after consideration of all options, in consultation with qualified professionals, experienced fabricators and contractors, and development of carefully written specifications should this work be undertaken.

The practice of using substitute materials in architecture is not new, yet it continues to pose practical problems and to raise philosophical questions. On the practical level the inappropriate choice or improper installation of substitute materials can cause a radical change in a building's appearance and can cause extensive physical damage over time. On the more philosophical level, the wholesale use of substitute materials can raise questions concerning the integrity of historic buildings largely comprised of new materials. In both cases the integrity of the historic resource can be destroyed.

Some preservationists advocate that substitute materials should be avoided in all but the most limited cases. The fact is, however, that substitute materials are being used more frequently than ever in preservation projects, and in many cases with positive results. They can be cost-effective, can permit the accurate visual duplication of historic materials, and last a reasonable time. Growing evidence indicates that with proper planning, careful specifications and supervision, substitute materials can be used successfully in the process of restoring the visual appearance of historic resources.

This Brief provides general guidance on the use of substitute materials on the exteriors of historic buildings. While substitute materials are frequently used on interiors, these applications are not subject to weathering and moisture penetration, and will not be discussed in this Brief. Given the general nature of this publication, specifications for substitute materials are not provided. The guidance provided should not be used in place of consultations with qualified professionals. This Brief includes a discussion of when to use substitute materials, cautions regarding their expected performance, and descriptions of several substitute materials, their advantages and disadvantages. This review of materials is by no means comprehensive, and attitudes and findings will change as technology develops.

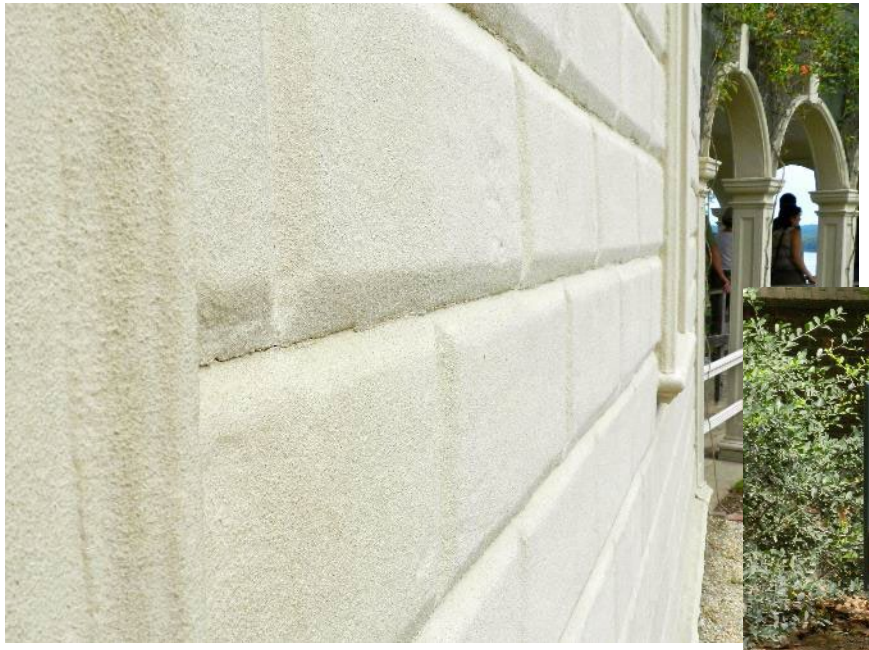
Historical Use of Substitute Materials

The tradition of using cheaper and more common materials in imitation of more expensive and less available materials is a long one. George Washington, for example, used wood painted with sand-impregnated paint at Mount Vernon to imitate cut ashlar stone. This technique along with scoring stucco into block patterns was fairly common in colonial America to imitate stone (see illus. 1, 2).

Molded or cast masonry substitutes, such as dry-tamp cast stone and poured concrete, became popular in place of quarried stone during the 19th century. These masonry units were fabricated locally, avoiding

LONG HISTORY OF USING SUBSTITUTE MATERIALS

200+ YEARS



Why Replace?

- Deteriorated?
  Condition must be evaluated – repair if possible
- Improvement?
  Better energy efficiency
  Wind load requirements
- Missing or not original?
  Consider appropriate replacement

CRITERIA FOR KEEPING ORIGINAL MATERIAL

- Is the original **material still available**?
- Is the original material of **decent or comparable quality**?
- Are there **skilled craftspeople** available to install the material? Can the owner do the work?
- **Expense vs investment:** life cycle analysis and economic considerations given to the PROPERTY not the individual

Douglas Fir Wood Comparison

Why Replace?

Original material is a proven technology

- Same species
- New – 16 growth rings
- Old – 64 growth rings
- 30%+ stronger

ALTERNATIVE MATERIALS

To allow or Not to allow

Step 1

- Preserve
- Repair
- Replace

What is the Treatment Strategy?

To allow or Not to allow

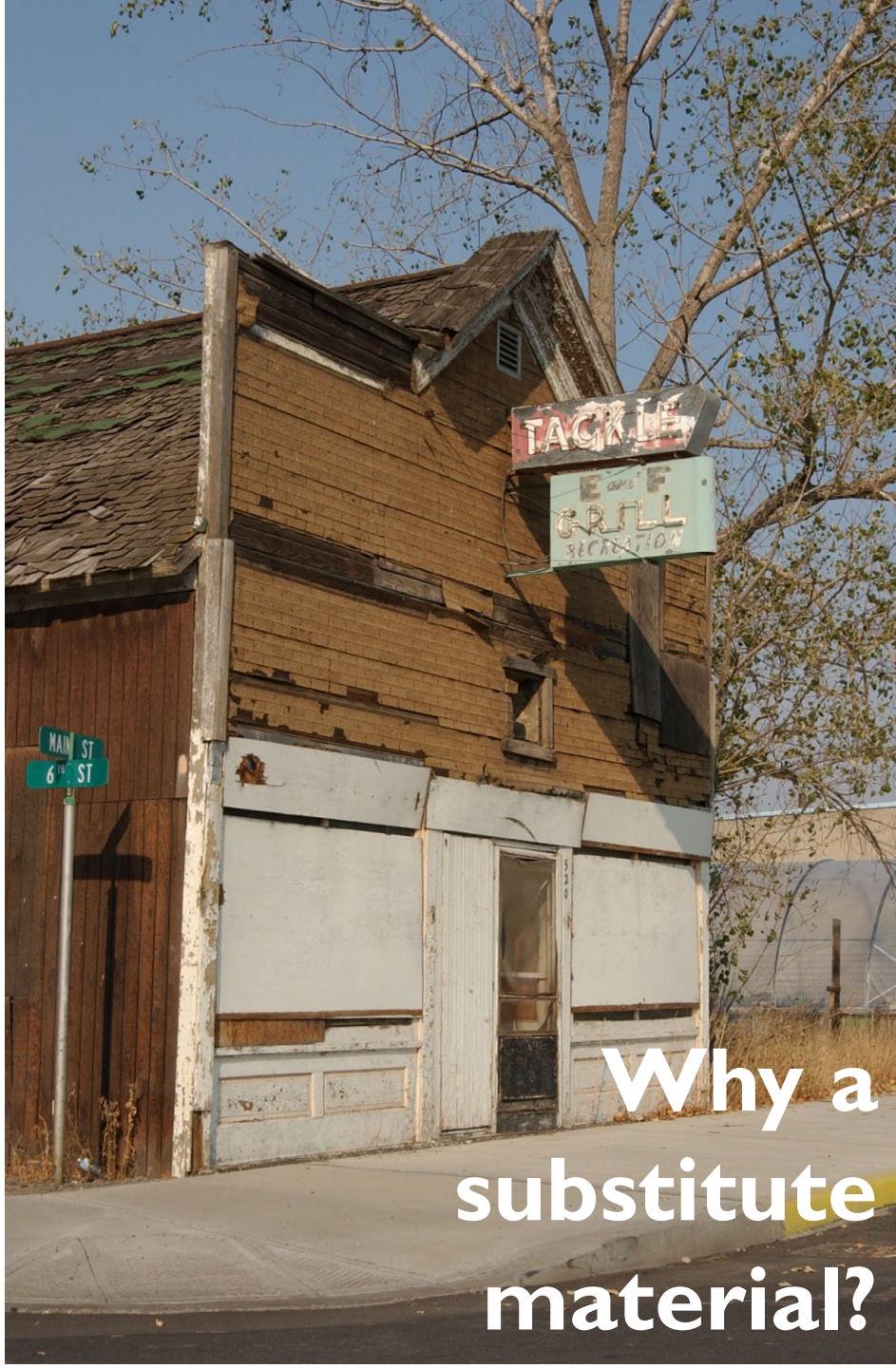
Step 2

- If you need to replace because of severe deterioration, match in:
  - Design
  - Color
  - Texture
  - Material, where possible

To allow or Not to allow

Step 3

- When to consider a new material:
  - The unavailability of historic materials
  - The unavailability of skilled craftsmen
  - Inherent flaws in the original materials
  - Code-required changes (which in many cases can be extremely destructive of historic resources)



Why a substitute material?

ALTERNATIVE MATERIALS

To allow or Not to allow

Step 4

- How to approve:
  - Develop Design Guidelines
  - Request mock-up
  - Design review acknowledges that the most appropriate features are to be preserved while refraining from dictating the outcome of the design; discussion is limited to the PROPOSED CHANGES.
  - Will the replacement material create a visual change?

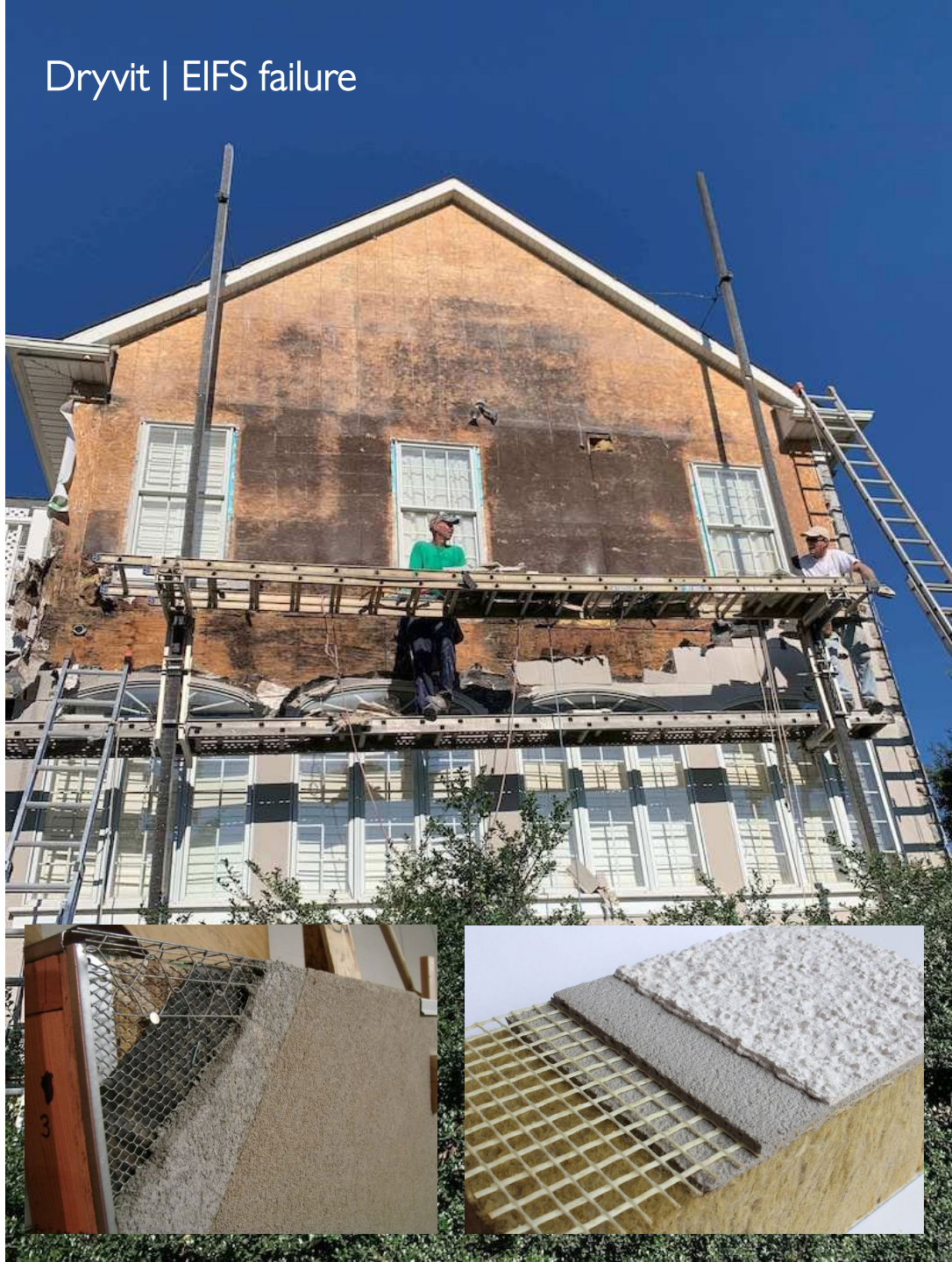
Considerations for substitute materials

- Does the new material closely resemble the original?
- Is the new material structurally compatible with remaining materials?
- Is the new material more durable than the original?
- Is the new material sustainable?
  - Embodied energy
  - Energy Efficiency
  - Toxicity
  - Recyclability

RESEARCH THE MATERIAL

Things to Remember

- Applicant's responsibility to pick a material to use in a replacement …. Not the commission
- If an applicant proposes a replacement material **– ALWAYS RESEARCH THE PRODUCT!**
- Many Products have a moderate-to-high failure rate
- Be sure you are researching the exact product proposed



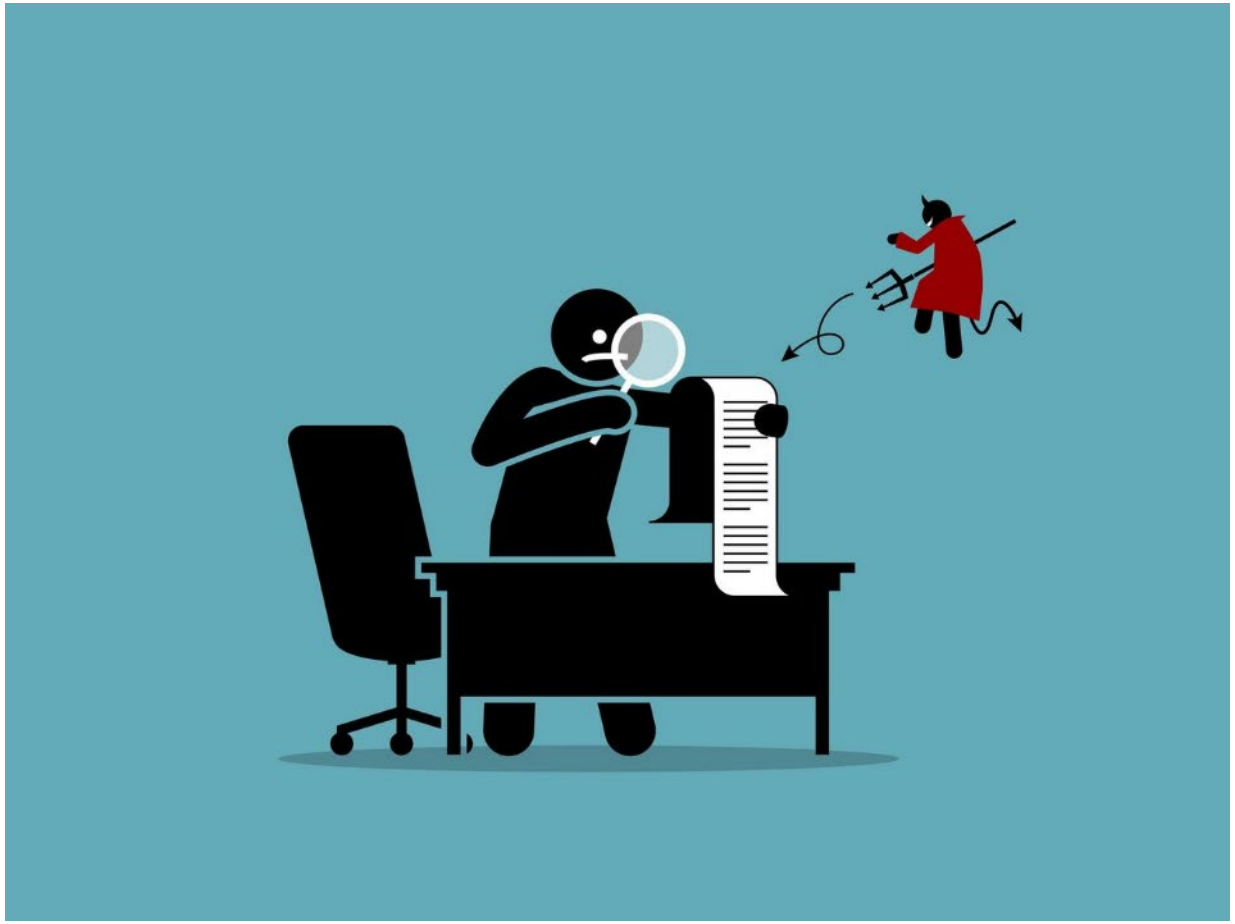
Only use substitute materials when the original is TOO DETERIORATED to repair!!!

What are the OPTIONS

ALTERNATIVE SIDING

OPTIONS

Replacement Siding



The Devil is in the Details!!

Cementitious Siding

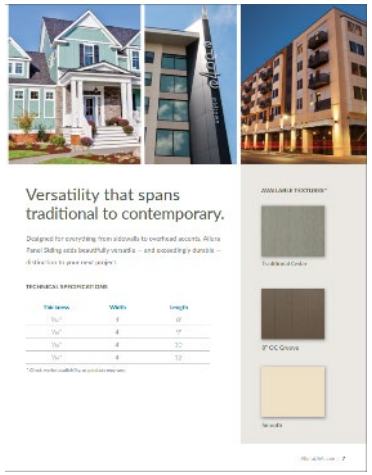
Many different brands and new products appearing regularly

Hardie Plank - Allura

- 45% Portland cement
- 45% silica
- 10% wood fiber
- Must have 2”+ from roofline (climate)

JamesHardie™

allura™ Making the Material Difference



Comparison slide - Cementitious

+ POSITIVE

- Smooth or textured
- Many different brands and new products appearing regularly
- Long life

— NEGATIVE

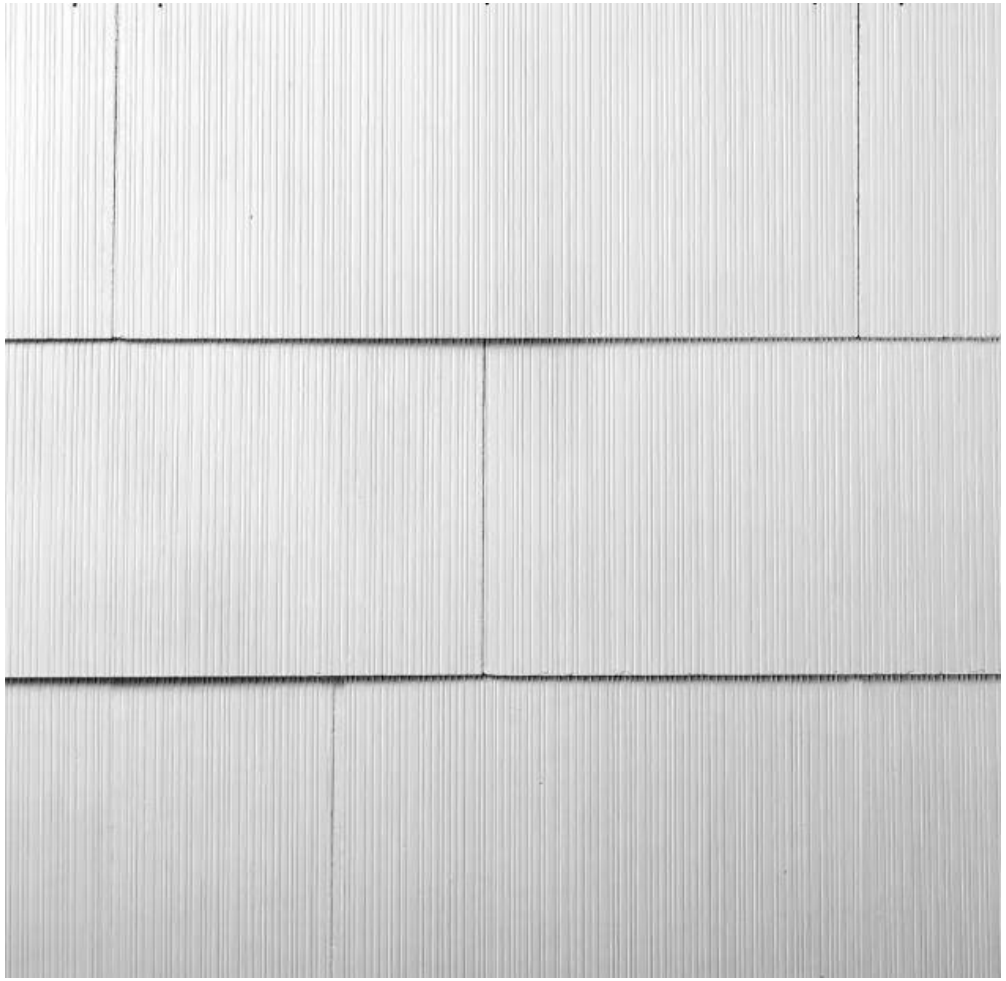
- Smooth or textured
- Many different brands and new products appearing regularly
- Must be cut with diamond blade saw
- Size difference from original
- Not repairable if Damaged
- Weight
- Varied Moisture Tolerance

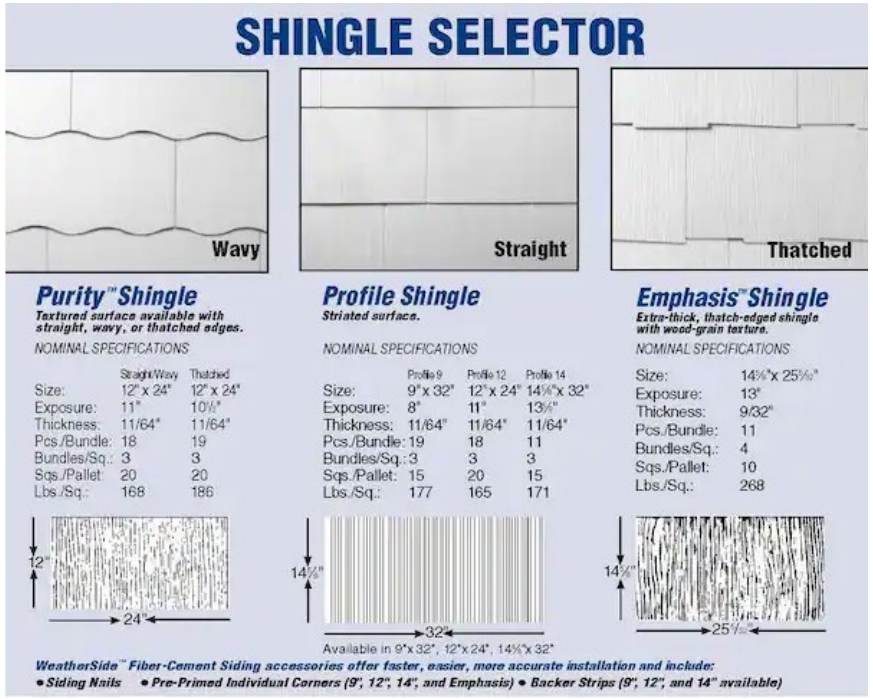
10 years after installation

Cementitious Siding

Shingles - Asbestos

- Portland cement & Asbestos fiber
- Fireproof
- Developed in 1905



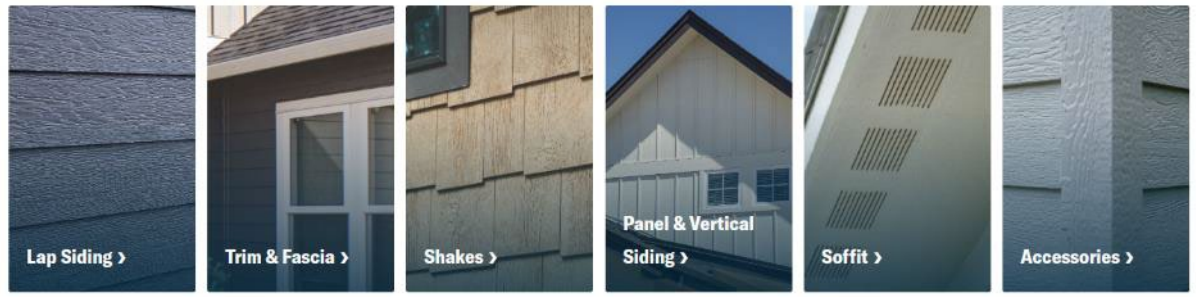


Engineered Wood Siding

LP SmartSide

- Wood strand
- Beveled shape
- Pre-primed
- No knots or voids

LP SmartSide® TRIM & SIDING



Comparison slide - Engineered Wood

+ POSITIVE

- Smooth or textured
- Many different brands and new products appearing regularly
- Long life?

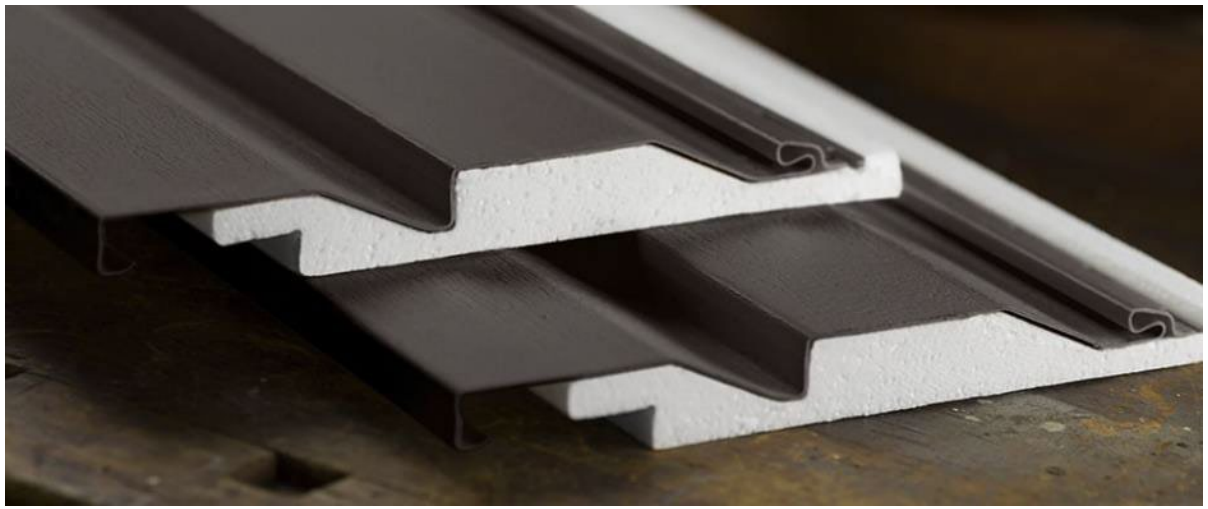
— NEGATIVE

- Many different brands and new products appearing regularly
- Size difference from original
- Not repairable if Damaged

Vinyl

Many different brands

- Smooth or textured
- Many different brands
- Many configurations, shingle
- Insulated



Comparison slide - Vinyl

+ POSITIVE

- Smooth or textured
- Many type options
- Long life
- Easily Cleaned

— NEGATIVE

- Alter historic profiles
- Masks deterioration of substrata
- Added J-channels, shadow lines
- Always has round profile
- Masked deterioration

Image courtesy of Mastic by Ply-Gem (mastic.plygem.com)

ALTERNATIVE MATERIALS

Engineered Wood Siding

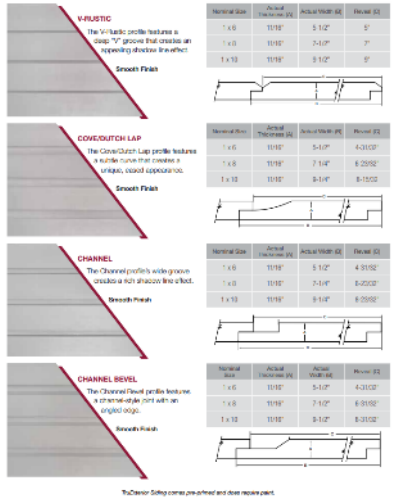
TruExterior - Boral

- Wood flakes coated in zinc borate + MDI resins and marine waxes
- Moisture resistant – can be installed within 1” of a roof (climate)

TruExterior® Siding & Trim

BORAL RESOURCES

BORAL®



Comparison slide - Engineered Wood

+ POSITIVE

- Smooth
- Many different brands and new products appearing regularly
- Long life
- Lightweight
- Near historic profile

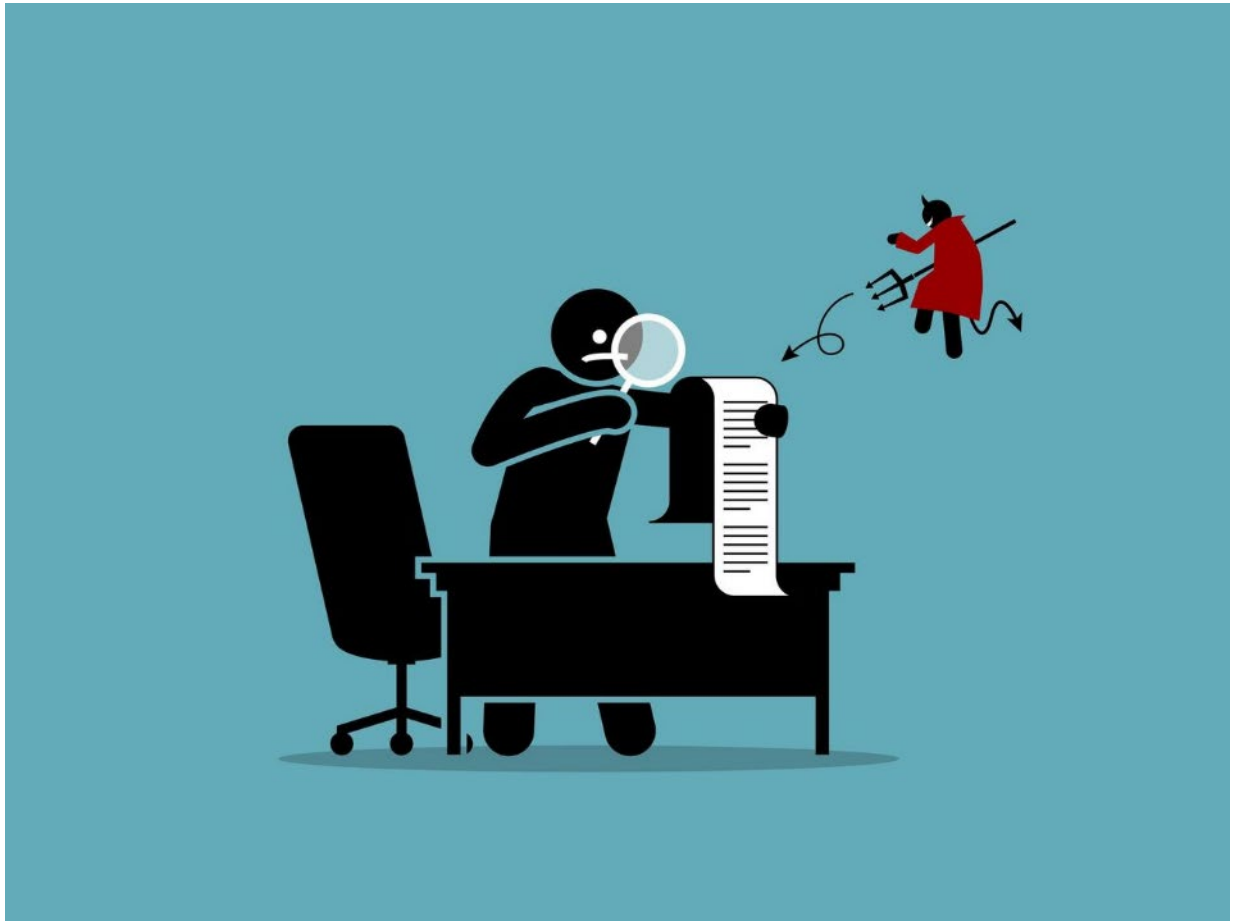
— NEGATIVE

- Smooth or textured
- Many different brands and new products appearing regularly
- Must be cut with diamond blade saw
- Size difference from original
- Not repairable if Damaged
- Weight

Trim - Flat Boards, Corner boards….

OPTIONS

Replacement Siding



The Devil is in the Details!!

Trim Boards

Things to Consider

- Match – thickness and width, sills
- solid PVC – expensive
- Shiny – not OK for historic homes
- High expansion & contraction
- Might be good for intricate shapes –bends with heat.
- Paintable?

ALTERNATIVE MATERIALS

Trim Boards

Material Types

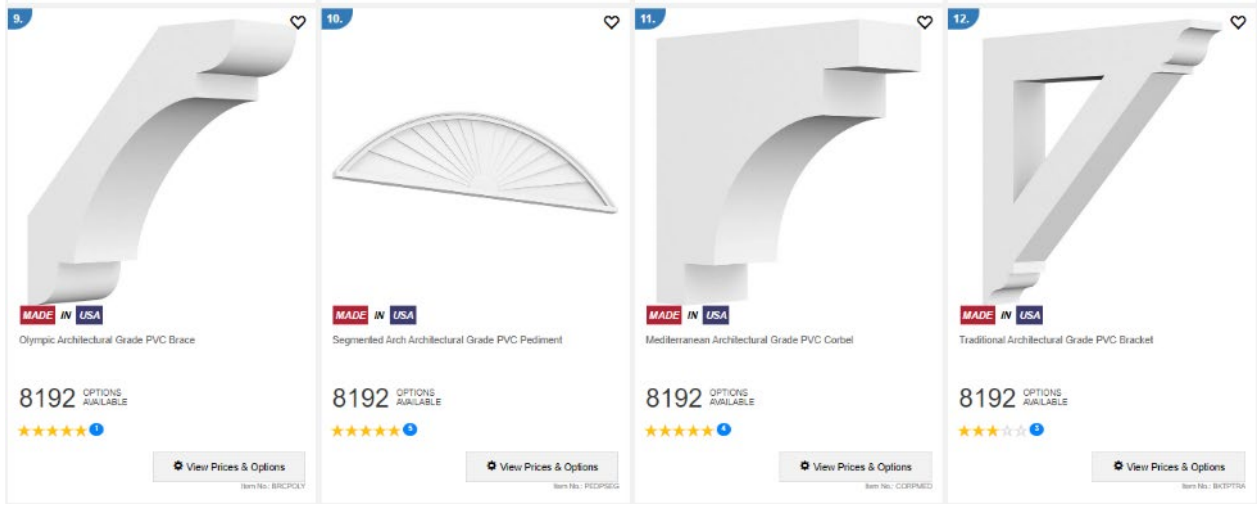
- Vinyl/PVC
- Finger jointed cedar wood siding (backprime)
- Composite
- Cementitious
- Premium clear wood siding
- Cedar

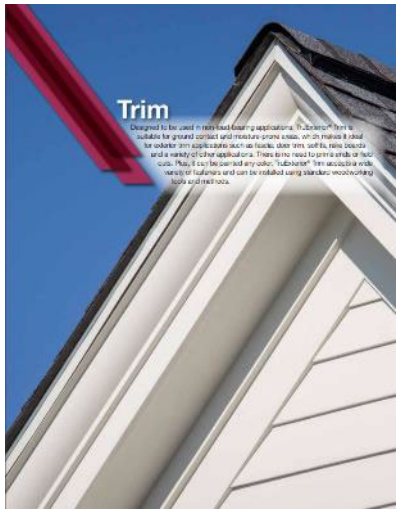
ALTERNATIVE MATERIALS

Trim Boards

Cost - Cheap to expensive:

- PVC boards - no structural strength – heavy & solid otherwise – recycled product-water resistant-all surfaces must be coated before installation
- Cementitious – cannot be routed or shaped – nailed under lap
- Most have fake wood grain pattern

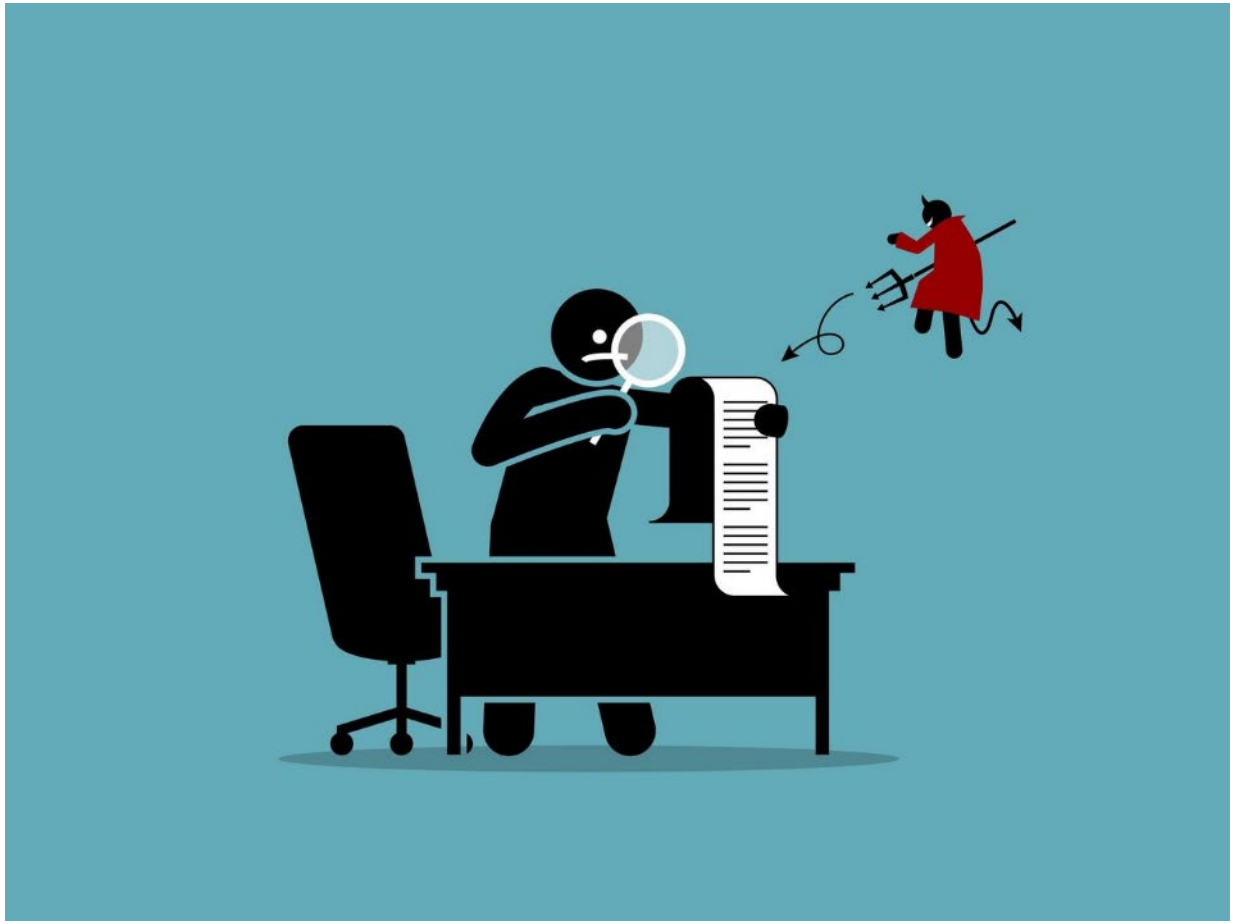




ALTERNATIVE PORCH | CORNICE MATERIALS

OPTIONS

Replacement Siding



The Devil is in the Details!!

Decking, Stair Treads

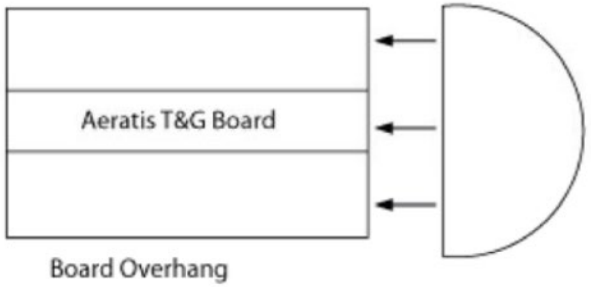
PRO:

- Visually compatible (SMOOTH)
- Longevity
- Bonds with paint

CON:

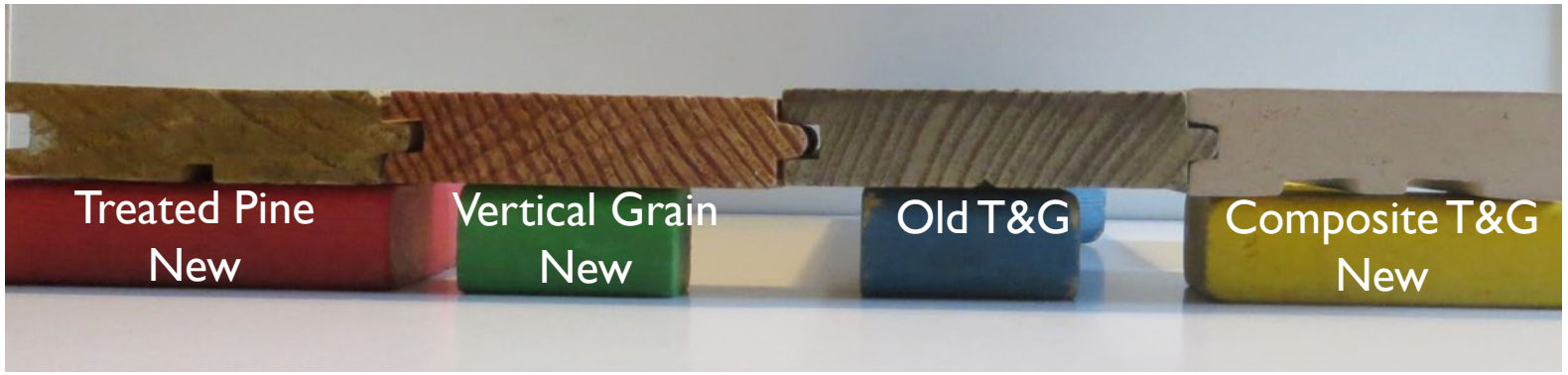
- Ends cannot be shaped to allow a bullnose for drainage.
- A separate half round or rounded plank must be installed perpendicular to the deck boards
- Longevity

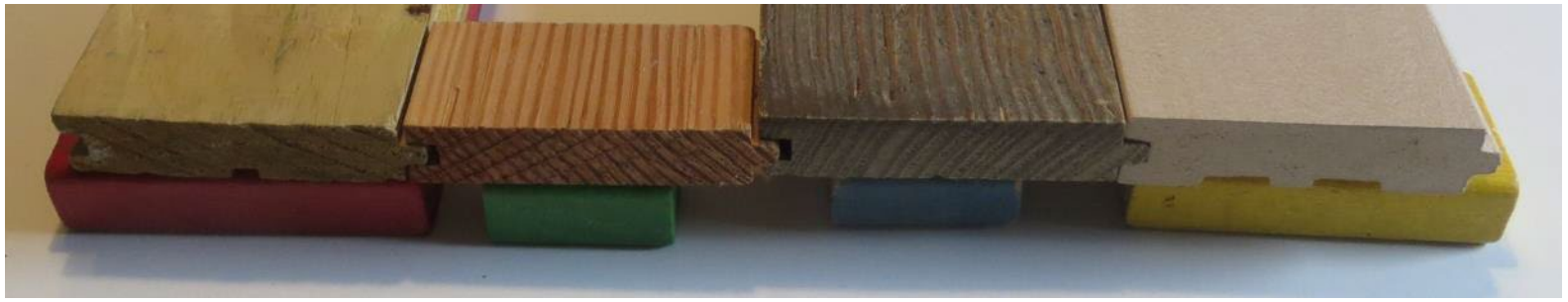
Half Round Application

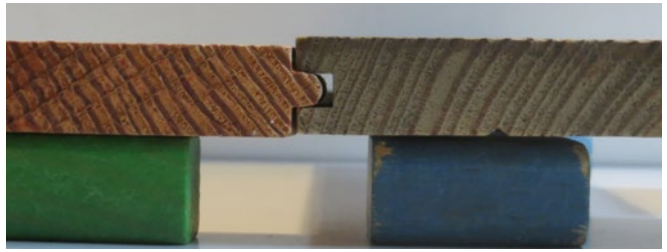


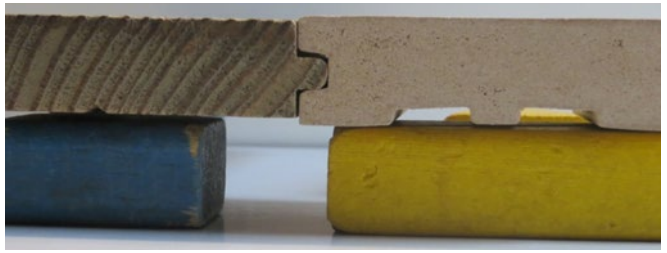
Decking, Stair Treads

VISUAL QUALITY COMPARISON









Composite Decking

FAILURES

Posts and Railings

FIBERGLASS

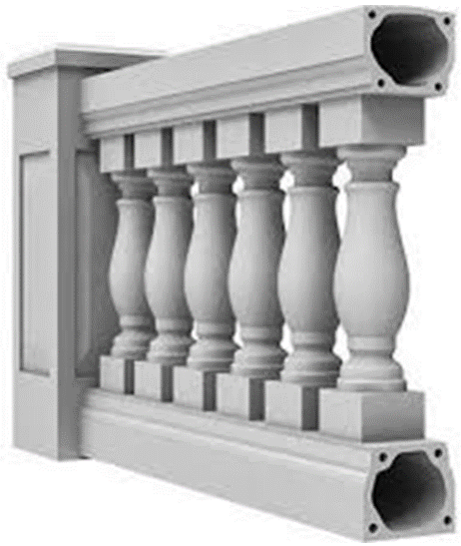
Load bearing fiberglass posts and columns
Material: thin glass fibers combined with plastics – rigid load bearing material

ALTERNATIVE MATERIALS

Porch Posts and Railings

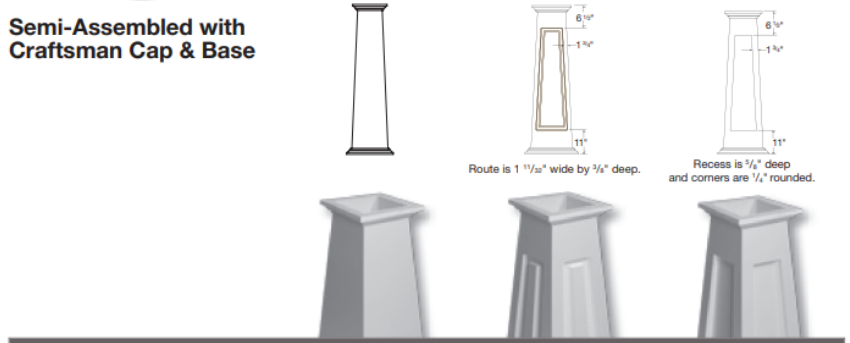
Fypon - Fiberglass

- Load bearing fiberglass posts and columns
- Material: thin glass fibers combined with plastics – rigid load bearing material



Tapered Column Wraps

Semi-Assembled with Craftsman Cap & Base



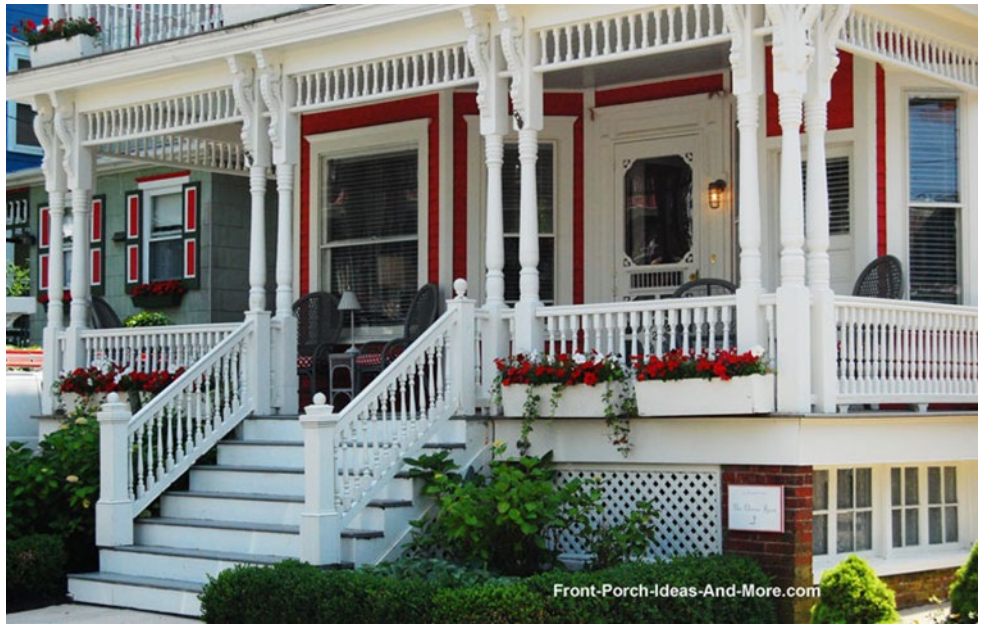
Shaft Width	Height	Plain	Raised Panel	Recessed Panel
8" Top 7 3/4" Actual 12" Bottom 11 3/4" Actual	4' (48")	CWKT86037	CWKT86172*	CWKT86195*
	4 ½' (54")	CWKT86038	CWKT86173*	CWKT86196*
	5' (60")	CWKT86039	CWKT86174*	CWKT86197*
	5 ½' (66")	CWKT86040	CWKT86175*	CWKT86198*
	6' (72")	CWKT86041	CWKT86176*	CWKT86199
	8' (96")	CWKT86042	CWKT86177*	CWKT86200
11" Top	4' (48")	CWKT86157*	CWKT86178*	CWKT86201*
	4 ½' (54")	CWKT86158*	CWKT86179*	CWKT86202*
	5' (60")	CWKT86043	CWKT86180*	CWKT86203*
	5 ½' (66")	CWKT86044	CWKT86181*	CWKT86204*
	6' (72")	CWKT86045	CWKT86182*	CWKT86205
	8' (96")	CWKT86159*	CWKT86183*	CWKT86206*
	4' (48")	CWKT86160*	CWKT86184*	CWKT86207*
	4 ½' (54")	CWKT86161*	CWKT86185*	CWKT86208*
	5' (60")	CWKT86162*	CWKT86186*	CWKT86209*
	5 ½' (66")	CWKT86163*	CWKT86220	CWKT86210*
	6' (72")	CWKT86164*	CWKT86187*	CWKT86211
	8' (96")	CWKT86165*	CWKT86188*	CWKT86212*

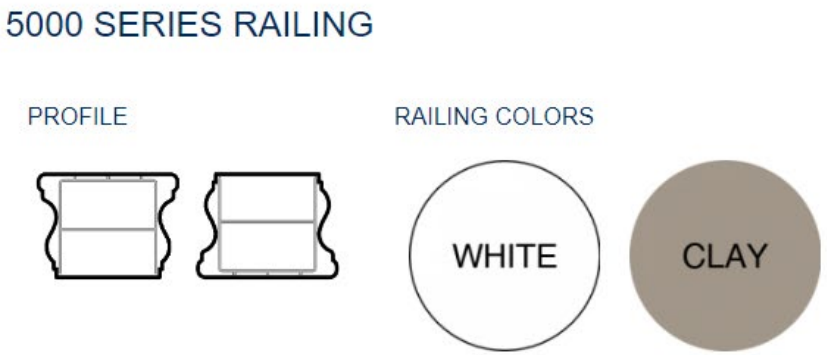
Porch Posts and Railings

Vinyl – Fypon (molded polyurethane)

- Scale of "turned" Victorian posts = rail height of 36+" (New Building Code)
- Vinyl deteriorates in sunlight (UV) – longevity unknown

FYPON





Porch Posts and Railings

Vinyl – Fypon (moulded polyurethane)

- Load bearing fiberglass posts and columns
- Material: thin glass fibers combined with plastics – rigid load bearing material

BORAL RESOURCES

BORAL®

TruExterior® Siding & Trim

Cornices

Polyurethane

- Available in thousands of standard profiles, paintable.
- Material: molded product made by mixing two foams together.

ROYAL CORINTHIAN®

ALTERNATIVE MATERIALS

Cornices

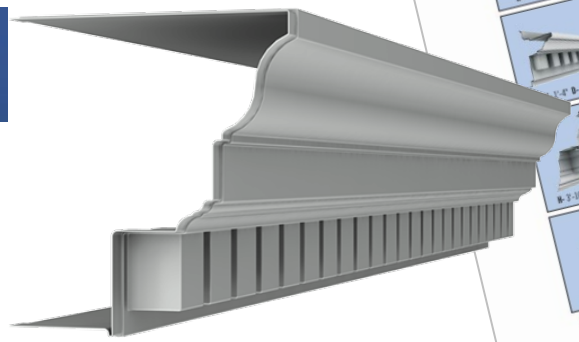
Fiberglass | Glass Fiber Reinforced Plastic (GFRP)

- Standardizes designs, and ability to produce simple to complex configurations
- Material: light weight, Class A fire rated, paintable

ROYAL CORINTHIAN®

STROMBERG
WE MAKE BUILDINGS BEAUTIFUL

EDON FIBERGLASS



Cornices / Wall

Synthetic Stone | Glass Fiber Reinforced Concrete (GFRC)

- Ability to produce simple to complex configurations, Cast
- Material: light weight, Class A fire rated, paintable

ARCHITECTURAL CASTINGS INC.

ROYAL CORINTHIAN®

STROMBERG
WE MAKE BUILDINGS BEAUTIFUL

EDON FIBERGLASS

HADDONSTONE

Cornices / Wall

Synthetic Stone | Polymer-modified Glass Fiber Reinforced Gypsum (PGRG)

- Ability to produce simple to complex configurations, Cast
- Material: light weight, Class A fire rated, paintable

ARCHITECTURAL CASTINGS INC.

ROYAL CORINTHIAN®

STROMBERG
WE MAKE BUILDINGS BEAUTIFUL

EDON FIBERGLASS

HADDONSTONE

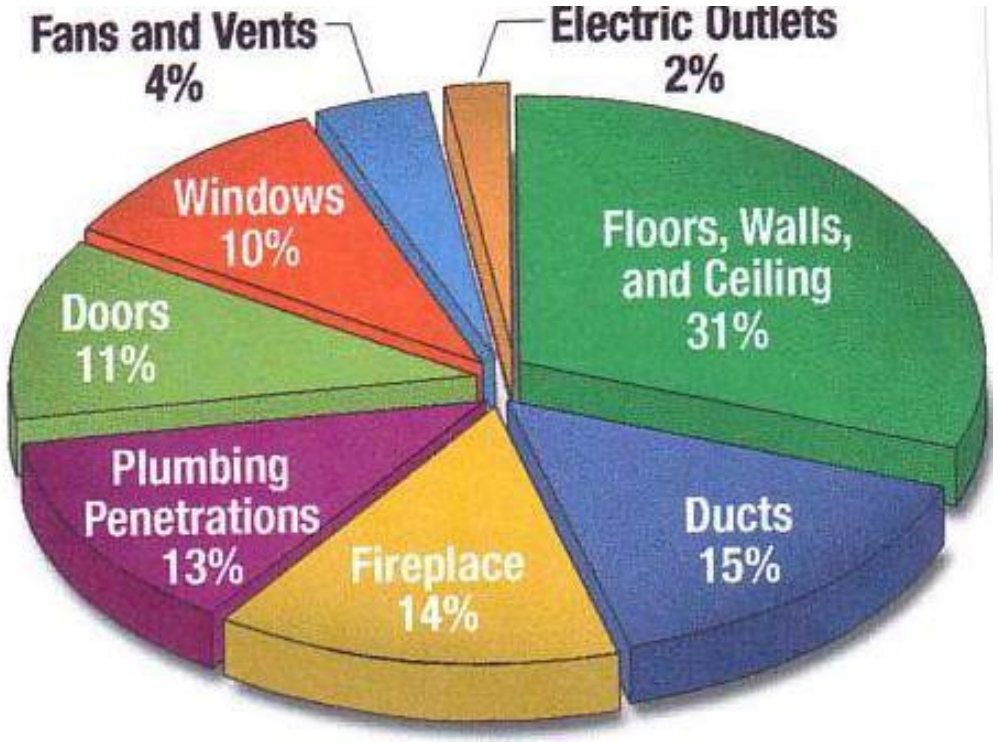
ALTERNATIVE WINDOWS

OPTIONS

WHY REPLACE?

- Repairable? What the existing condition?
- Deteriorated beyond repair?
- No available tradespeople to do the work?

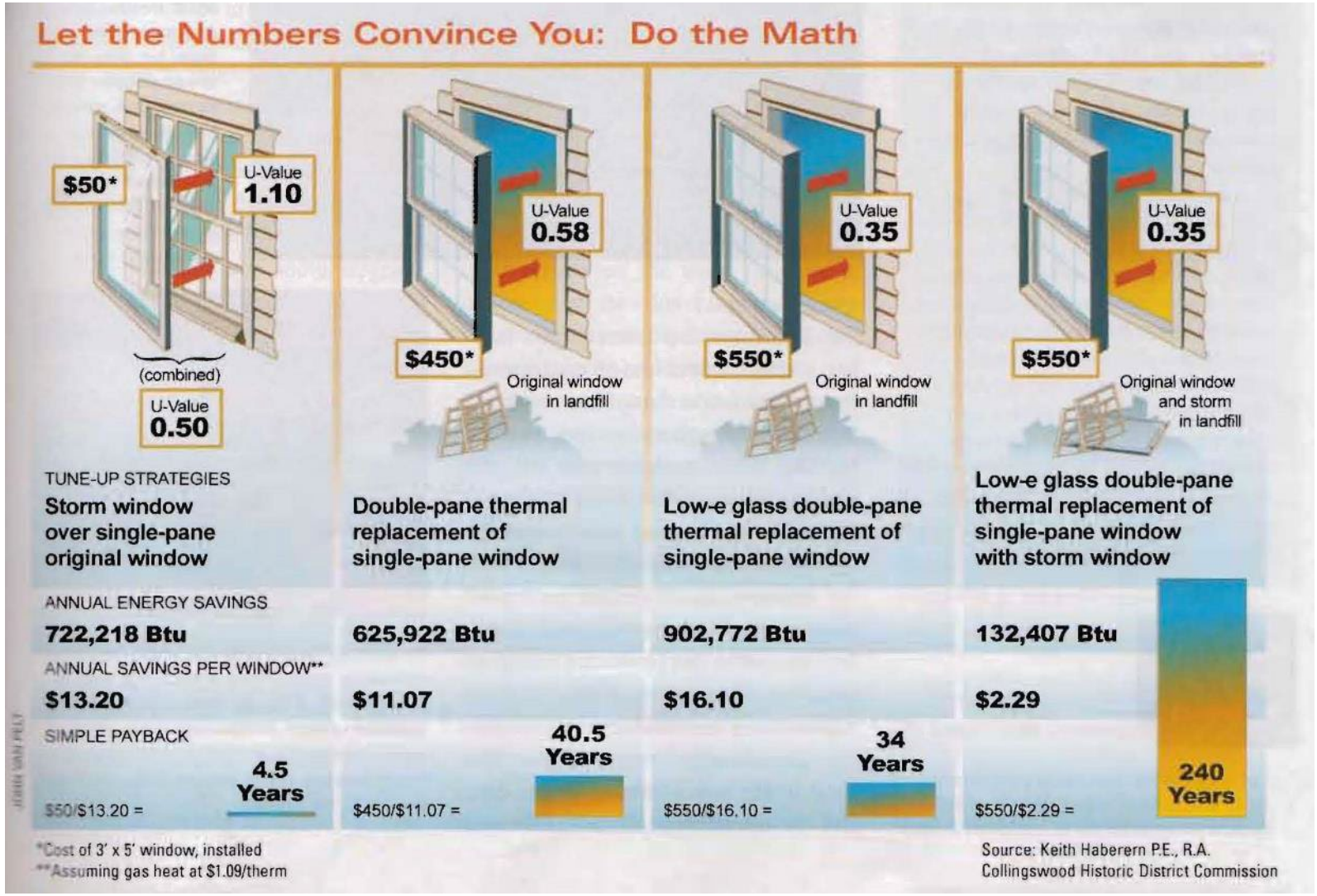
Why? Energy Saving?
Heat loss



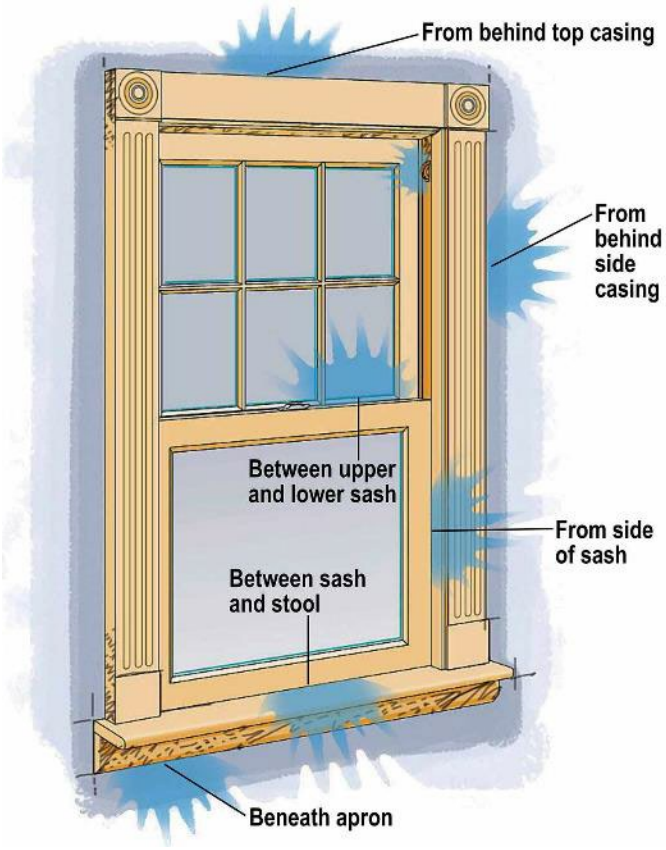
The U.S. Department of Energy states that windows account for only 10% of air infiltration, while floors, walls, and ceilings account for over 30%. Insulation in floors and attics can offset the minimal energy loss in windows. The primary culprit for energy loss in windows is air infiltration around the perimeter of the frame and the movable sash. Weather-stripping, caulking, and the installation of a storm window greatly reduce air infiltration, while replacing the original window and installing a replacement will have a minimal positive effect.

Windows = 10-15% of typical building heat loss!

ENERGY SAVINGS



Weatherstripping



Replacement Windows

THINGS TO CONSIDER

- One third of all replacement windows are less than 10 years old.
- Advertisements from replacement companies are recommending owners consider replacement after 8 years!

Windows

Wood Types

Simulated Divided-Light between glass

Interior Wood Muntins only with Vinyl exterior or simulated exterior and interior

True Divided-light

Simulated Divided-Light

Simulated Divided-Light with spacer

Windows

Other Types

Fiberglass

Fiberglass and wood

Aluminum clad

Vinyl

Vinyl clad

Comparison slide

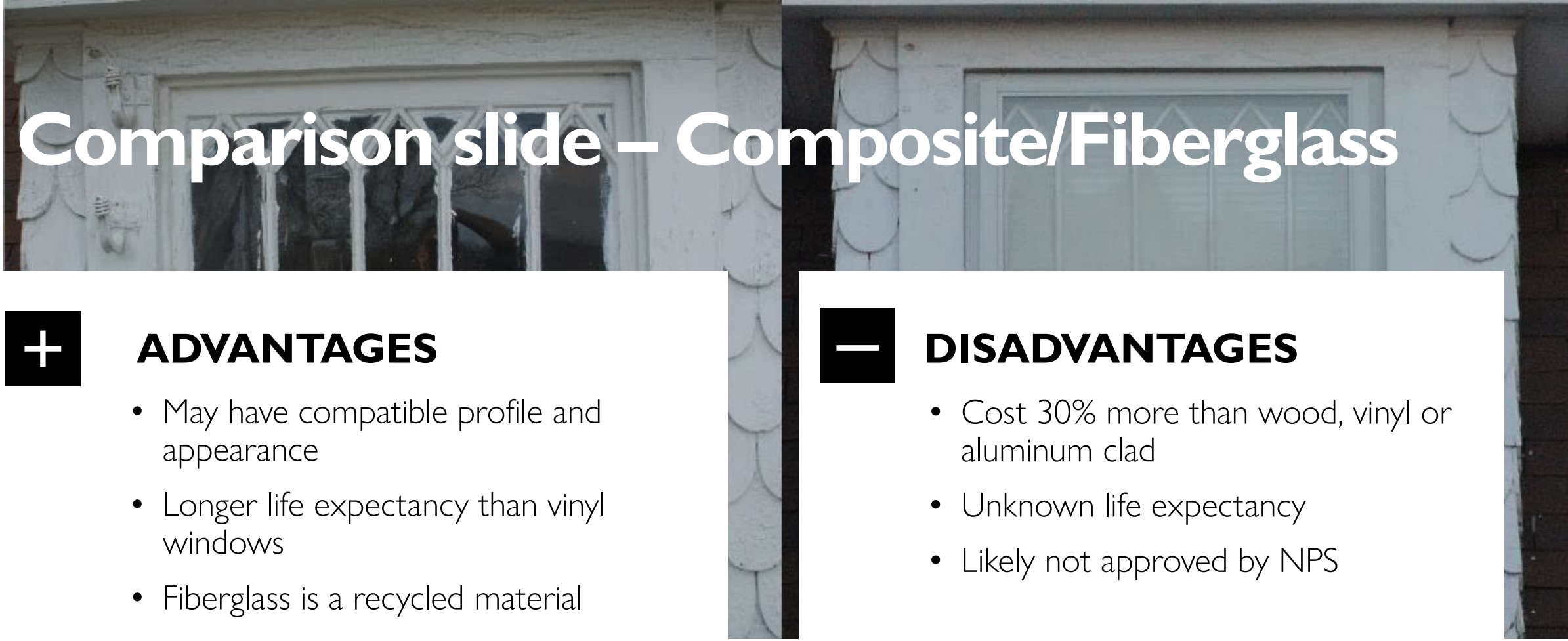
+ WOOD

- Match existing profiles and configuration
- May be true divided lites or
- EXTERIOR applied dimensional muntins AND between bi-glass
- Thermal windows ideally should have a grid between the layers of glass to simulate a true divided lite.

— FIBERGLASS

- Can match profiles of traditional wood windows
- Cost 30% more than wood
- Similar to wood in expansion & contraction
- Unknown life expectancy
- Tax credit?? Maybe??

Comparison slide – Composite/Fiberglass



+ ADVANTAGES

- May have compatible profile and appearance
- Longer life expectancy than vinyl windows
- Fiberglass is a recycled material

— DISADVANTAGES

- Cost 30% more than wood, vinyl or aluminum clad
- Unknown life expectancy
- Likely not approved by NPS

Comparison slide

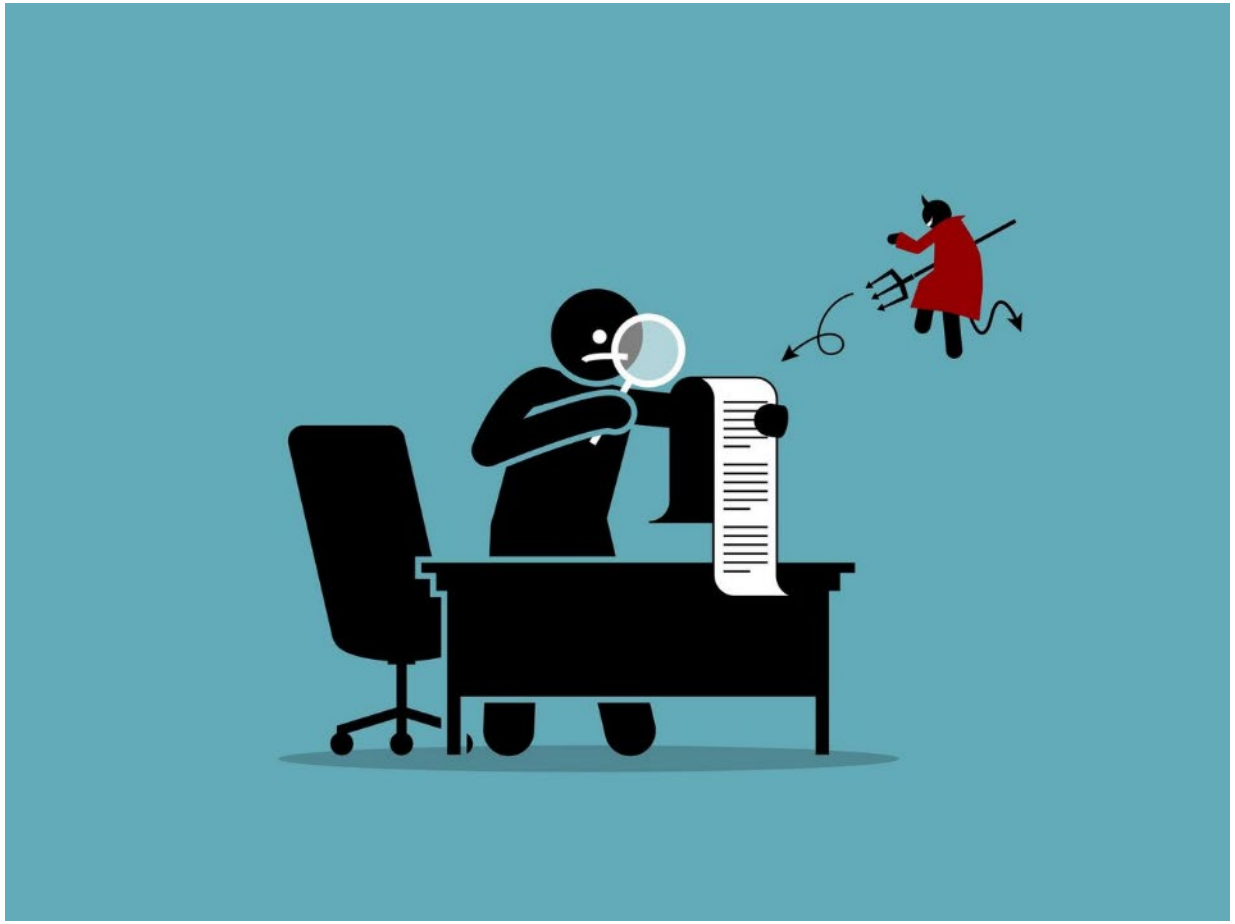
+ VINYL

- Less expensive than wood or other materials
- Shorter live expectancy
- Not repairable – re-replacement 60%
- Flexes a lot
- Higher contraction and expansion

– VINYL OR METAL CLAD

- Stainable or paintable wood on interior
- When (not if) seal between glass and cladding fails, finger-jointed wood can rot – hidden by the cladding

Replacement Windows



The Devil is in the Details!!

Replacement Windows

THINGS TO CONSIDER

- Match Existing Profiles and Configuration

Replacement Windows

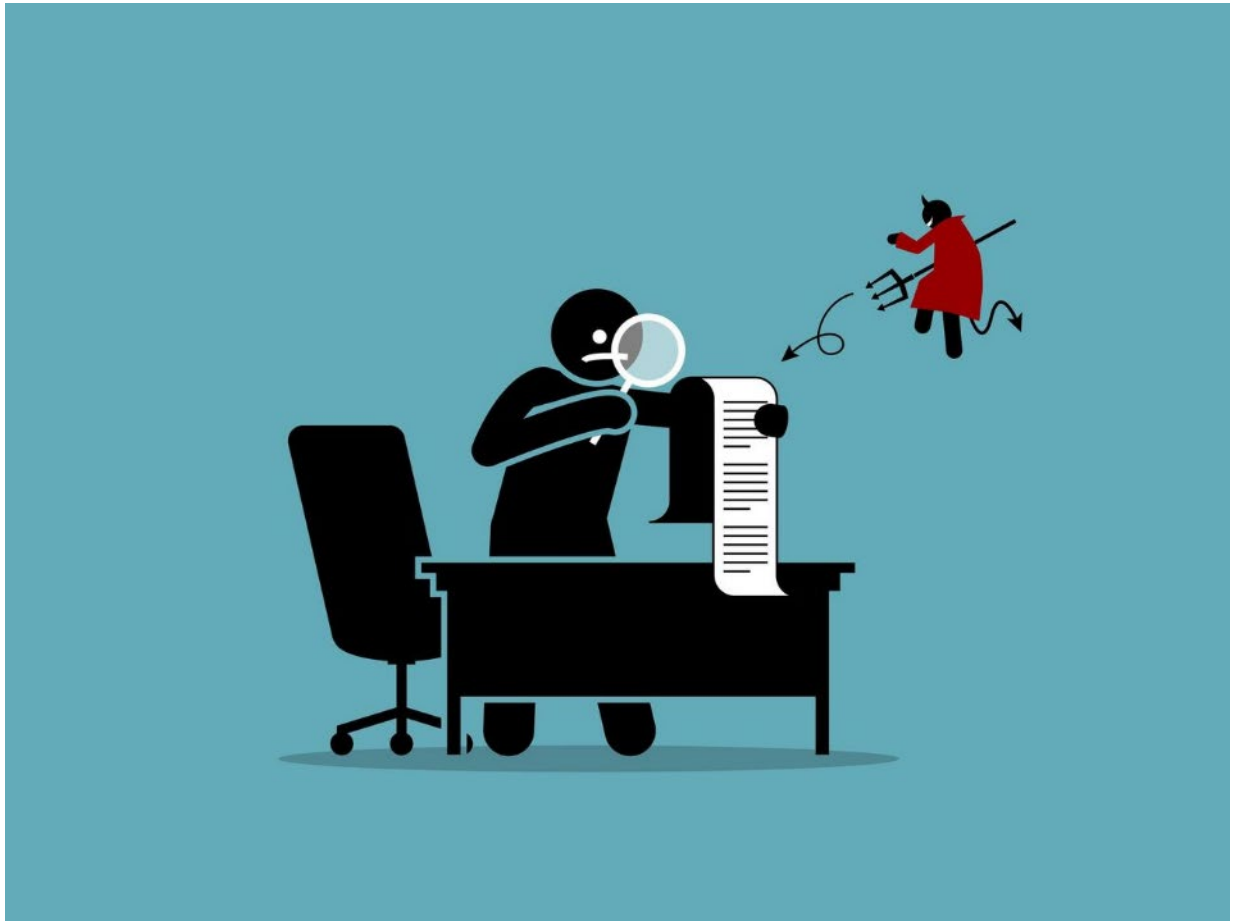
THINGS TO CONSIDER

- Size
- Configuration
- Material

ALTERNATIVE ROOFING

OPTIONS

Replacement Roofing

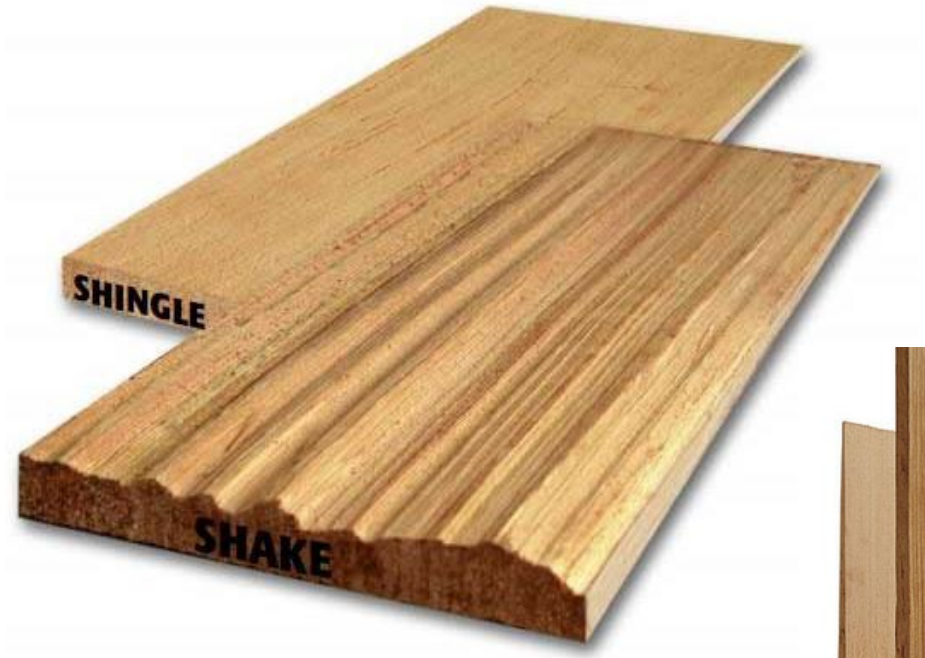


The Devil is in the Details!!

Comparison slide

Cedar shakes and Cedar shingles are not the same thing. Shakes are hand-split (or look like hand-split) and Shingles are sawn (or look like they're sawn)

+ SHINGLE

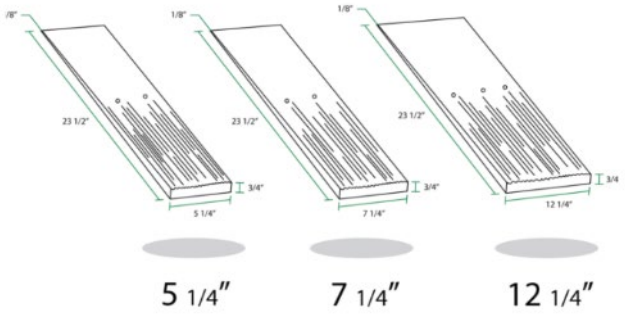


– SHAKE

Roofing - Shake

Rubber – DaVinci / Brava / EcoStar

- Installs like traditional shakes
- Varied size and color
- Lightweight
- 50-year warranty



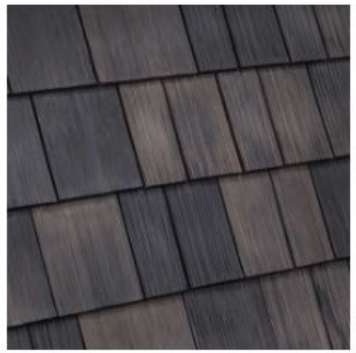
DaVinci Roofscapes

BRAVA

EcoStar

CeDUR
SYNTHETIC ROOFING PRODUCTS

Enviroshake
Quality Engineered Roofing





Roofing - Shingle

Plastic – Enviroshake

- Composite product containing recycled plastics, wood fibers, and elastomers (rubber).
- Manufactured in sets that are tied together as a unit

Enviroshake®
Quality Engineered Roofing

Enviroshingle™

Roofing - Shingle

Terra Cotta – LudoShakei

- Heavy but very durable – 75 year warranty
- Larger exposure than what we see in PNW
- Interlocking individual tiles

LUDOWICI®

ALTERNATIVE MATERIALS

Roofing - Shingle

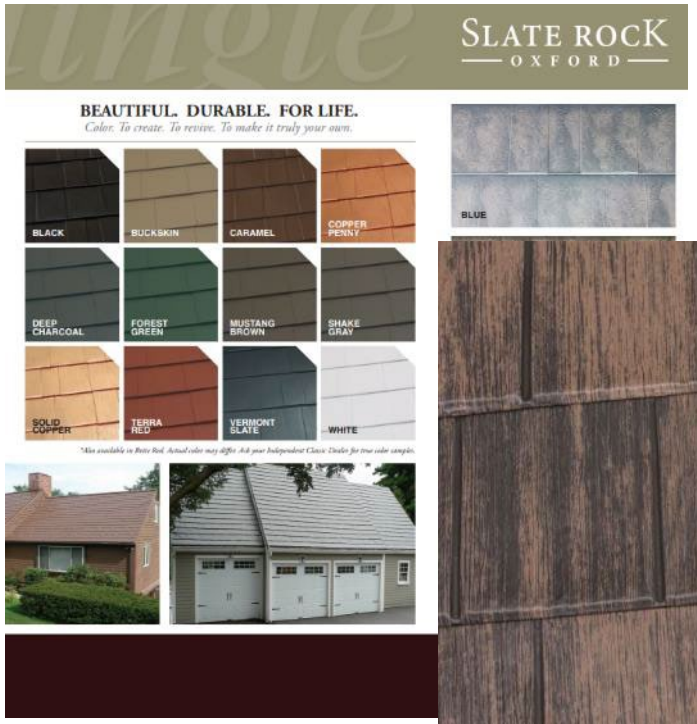
Metal – Aluminum & Steel

- Large interlocking Panels
- Varied color
- Many are glossy

KASSEL & IRONS

CLASSIC METAL ROOFING SYSTEMS
The World's Most Beautiful Metal Roofs

INTERLOCK
Lifetime Roofing Systems®



Roofing - Shingle

Metal – Decra

- Installs like traditional shakes
- Varied size and color

DECRA Shingle XD Specs

Product Size: 14-⅛" x 52-⅜"
Installed Exposure: 12-¼" x 49-½"
Panels per Square: 23.8 per 100 sq. ft.
Panels per Pallet: 280
Squares per Pallet: 11.8
Pallet Weight: 1,719 lbs.
Installed Weight: 150 lbs. per 100 sq. ft.
Installation Method:
Designed to be Installed Direct to Deck


DECRA SHINGLE XD **Classic Cobblestone**


DECRA SHINGLE XD **Midnight Eclipse**

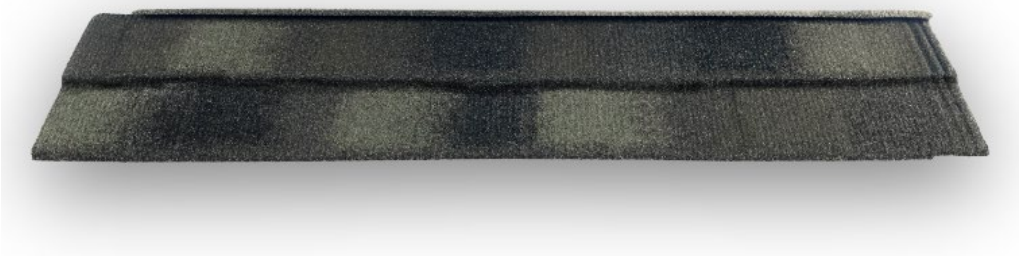

DECRA SHINGLE XD **Natural Slate**


DECRA SHINGLE XD **Old Hickory**


DECRA SHINGLE XD **Woodland Green**

DECRA® METAL ROOFING

Classic Cobblestone



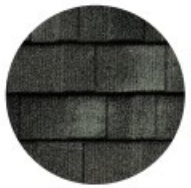
DECRA SHINGLE XD®

Shingle at a Fraction of the Weight

DECRA Shingle XD has the rich, bold appearance of a heavyweight architectural shingle at a fraction of the weight. With its thick-cut edges and deep, distinctive shadow lines, DECRA Shingle XD provides greater dimensionality and a robust appearance. This profile adds the aesthetics of wood shingles without the ongoing maintenance that comes with a conventional wood roof.


CLASSIC COBBLESTONE

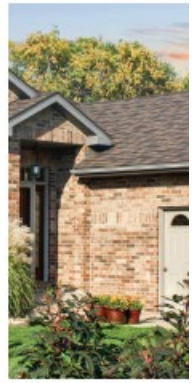

MIDNIGHT ECLIPSE


NATURAL SLATE


OLD HICKORY

WOODLAND GREEN*

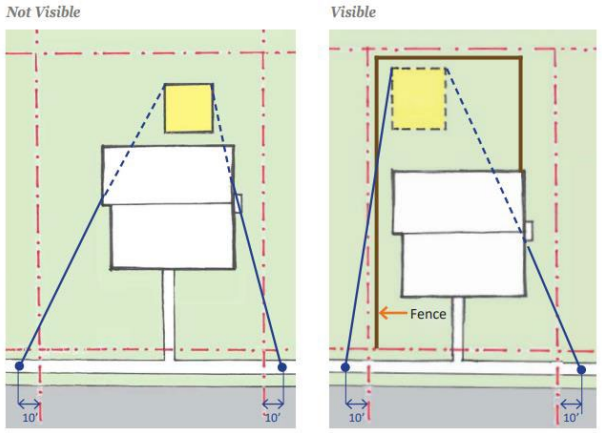
*Please note these colors are MTO (made to order) and production times may be extended.

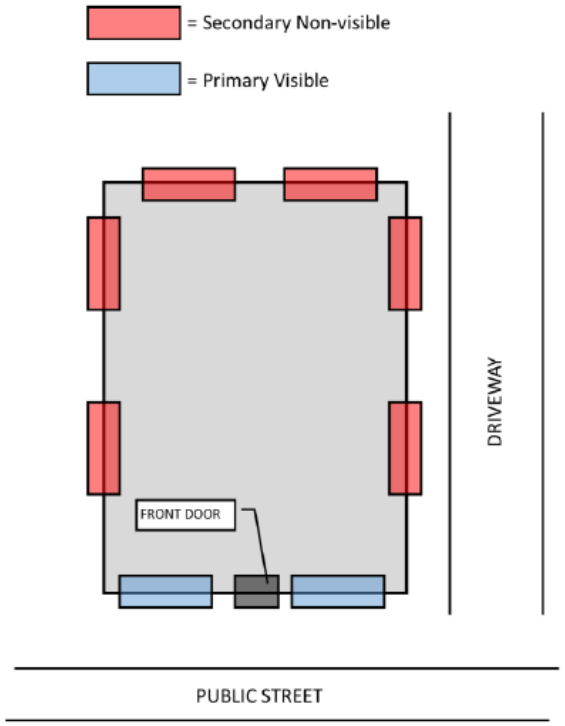


ALTERNATIVE MATERIALS

But I just want to replace these old drafty things!

ALTERNATIVE MATERIALS





- Allow certain products on different facades
- Allow certain products on Contributing, different products on Non-Contributing
- Prescribed lists of approved products

	Wood	Aluminum	Vinyl	Aluminum-Clad	Fiberglass *
Renewable	Yes	No	No	No/Yes	No
Extraction Energy	Low	High	Medium	Medium	Medium
Manufacture Energy	Low	High	Medium	Medium	Low
Maintenance	High (5-7 Years)	Low	Low	Low	Low
Energy Efficiency	Good	Poor	Good	Good	Unknown*
Life Span (years)	16-43.6	43.6	18-24	46.7	~50 (Unknown)*
Disposal	Recyclable	Recyclable	Landfill/ Toxins	Recyclable/Disassemble Costs	Landfill
Historic Accuracy	High	Low	Low	Medium	Medium
Cost	High	Low	Low	Medium	Medium
Availability	Good	Fair	Good	Mid-high	Fair

What does Preservation mean?

- Preservation means **using historic properties**
- Preservation means **accommodating change**
- Preservation means **maintaining key character-defining features**


DEATH BY A
THOUSAND CUTS

QUESTIONS?

HTTP://WWW.DAHP.WA.GOV

MICHAEL HOUSER

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dahp
protect the past, shape the future
DEPT OF ARCHAEOLOGY + HISTORIC PRESERVATION

MURALS: USING THE RIGHT PRODUCT

Michelle Thompson
Main Street Design Specialist and CLG Coordinator
DAHP

ONE TIME IN PROVO
Alex Vaughan, 2018 CE
250 West Center Street
Provo, Utah

Images: Jansen Bennett

Image: Amber Anderson

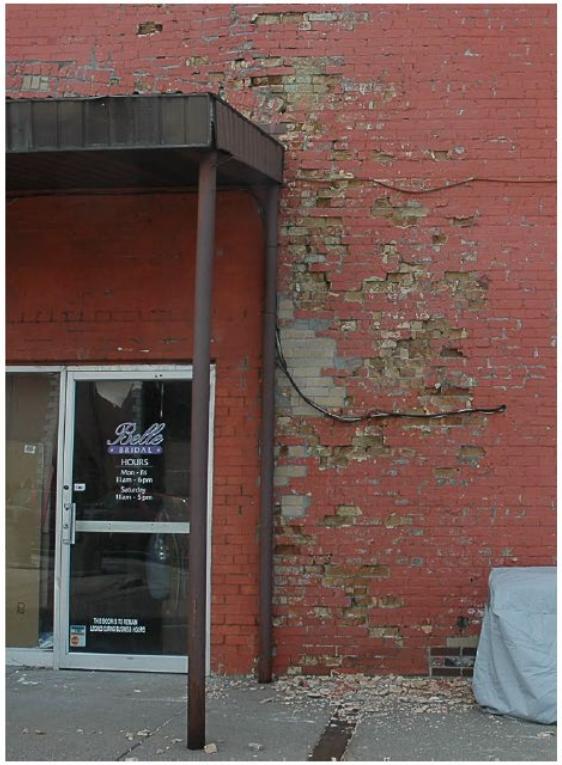


Image: Korral Broschinsky

Brick is porous and needs to " breathe".
Latex and Acrylic paint act as a moisture barrier in brick.

This causes water to become trapped in the brick. Destabilizing the brick's structure and causing the face of the brick to peel (spalling).

EXTERIOR ADVERTISEMENTS 1870 - PRESENT

ADVERTISEMENT, "SOLD FROM ALASKA TO AUSTRALIA"
c. 1915 CE
Garland, Utah

Image: Amber Anderson

Linseed Oil paint (expensive) or Whitewash (bleeds in the rain) were used historically.

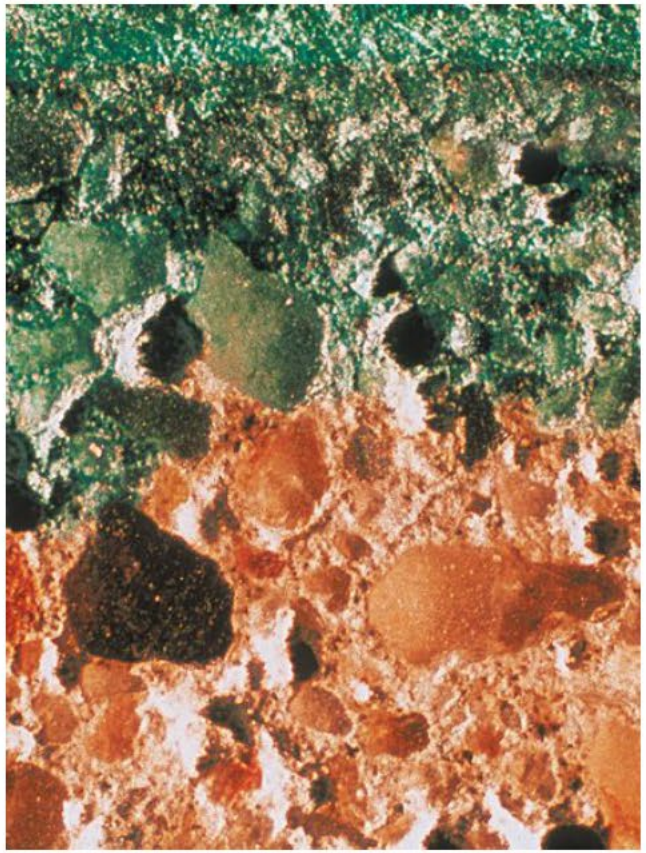
Silicate Paint

HEART OF OHIO
Eric Grohe, c. 2000-2010 CE
Marion, Ohio

Image: KEIM

- 2.5 x the $
- Paint does not fade, peel or bubble
- Fuses with the brick
- Similar to limewash- but harder
- Vapor permeable (no spalling!)

79



SILICATE PAINT
Masonry Section

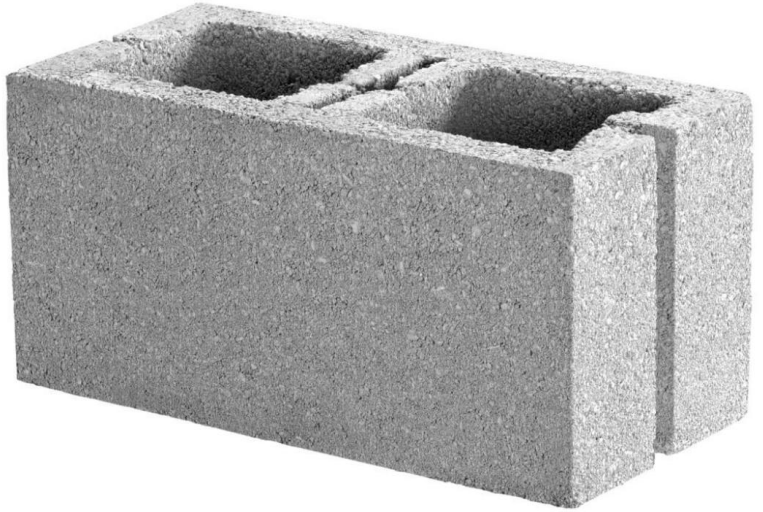
Image: KEIM

SILICATE PAINT
Surface Detail

Image: BEECK

80

Latex and Acrylic Paint won't damage wood (it actually protects it) or concrete block (CMU) but can still fade, bubble, or peel.



THANK YOU

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