Land Use Planning & Wildfire Forum

Presentations

Creating fire-adapted communities through better land use planning in the wildland-urban interface

January 24-25, 2018 | St. Julien Hotel, Boulder, CO

COMMUNITY PLANNING ASSISTANCE FOR WILDFIRE

Research

How Much Does it Cost to Build a Wildfire-Resistant Home?

Costs to Build a Wildfire-Resistant Home

Stephen L. Quarles, Ph.D.

Chief Scientist for Wilfire and Durability

Insurance Institute for Business and Home Safety

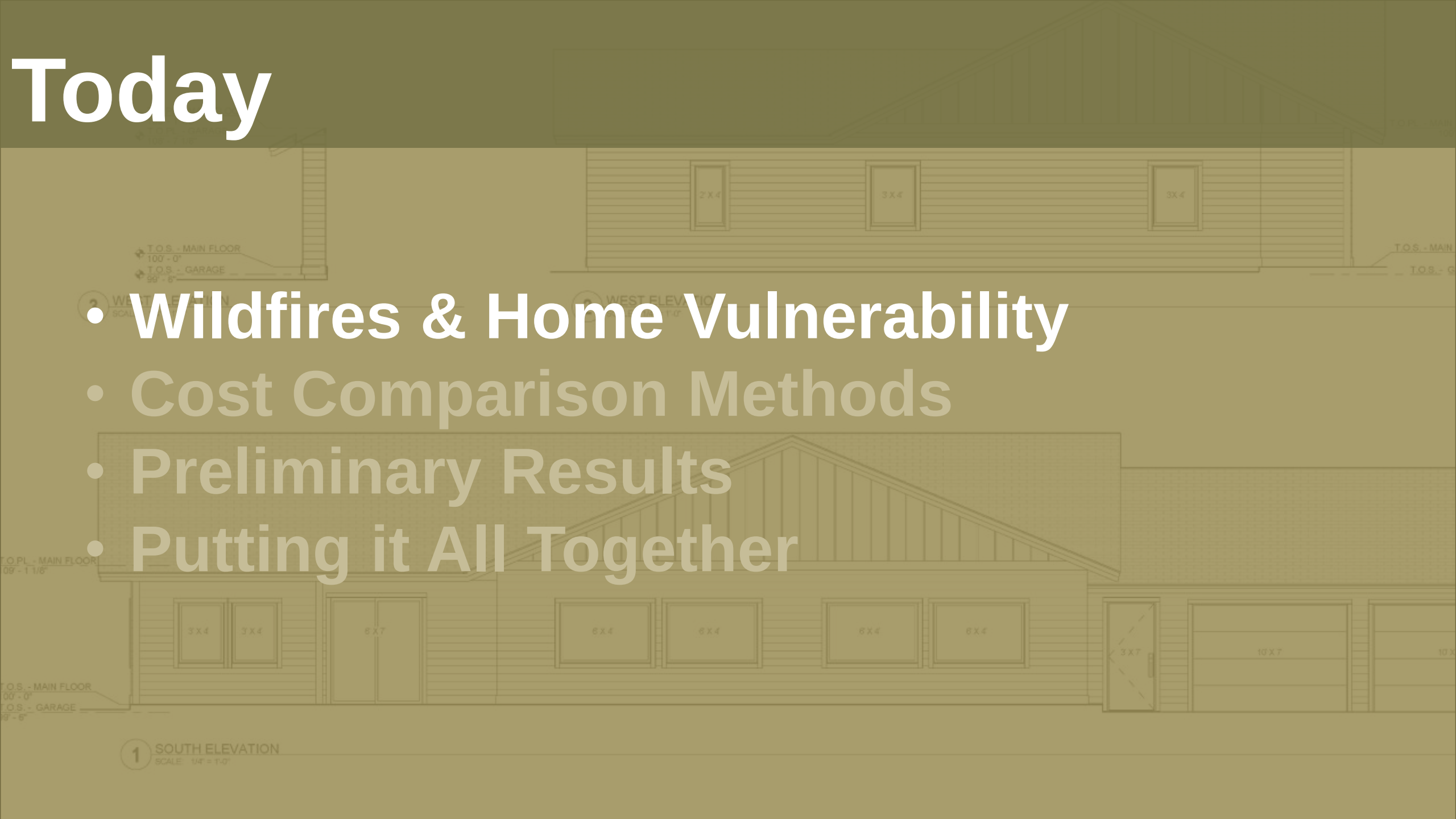
- What is a wildfire-resistant home?
- How does the cost compare to traditional homes?

Today

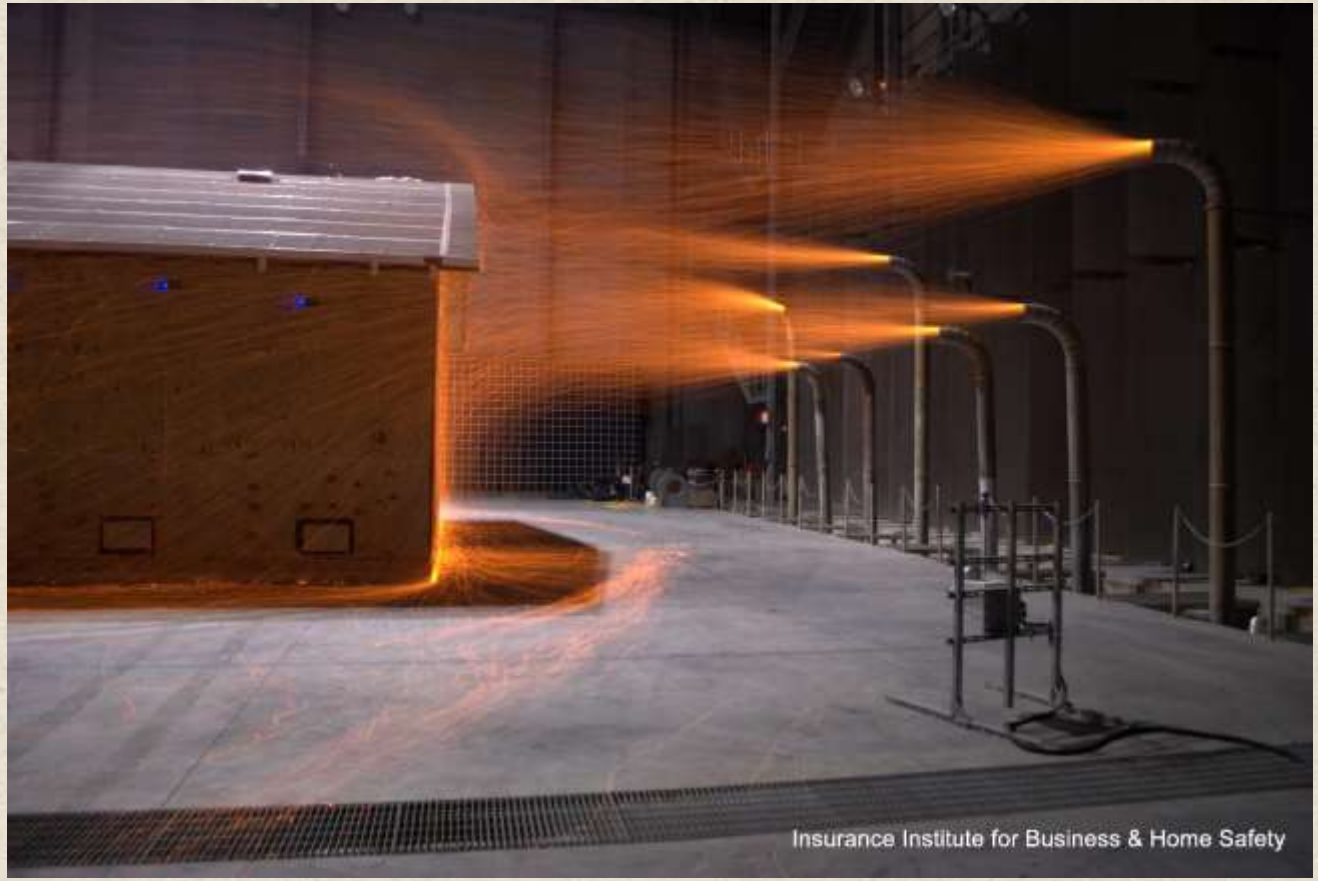
- Wildfires & Home Vulnerability
- Cost Comparison Methods
- Preliminary Results
- Putting it All Together

Today

- **Wildfires & Home Vulnerability**
- **Cost Comparison Methods**
- **Preliminary Results**
- **Putting it All Together**



Importance of Wind-blown Embers



A Coupled Approach

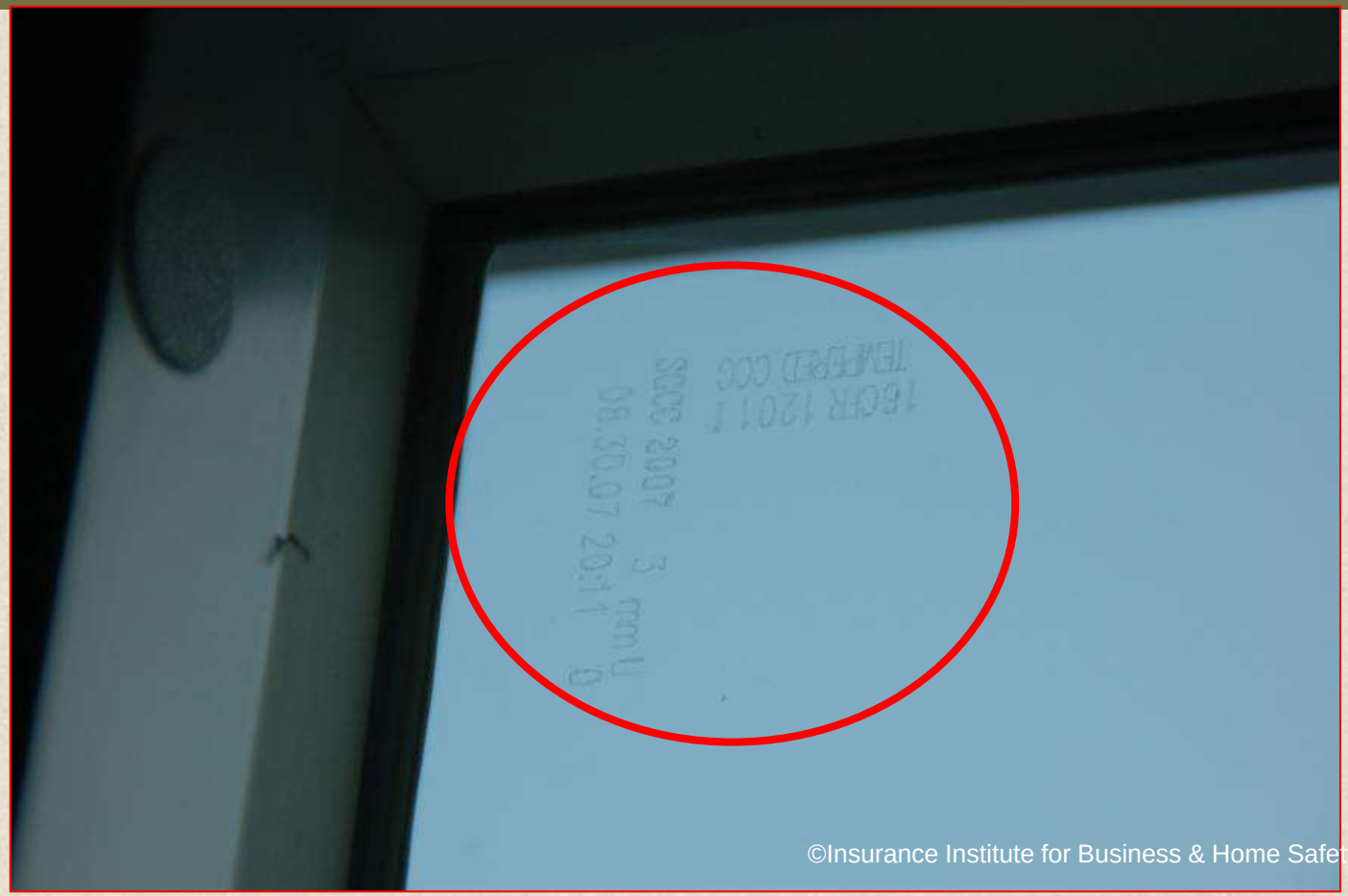
Materials versus Details

"... the resistance to (wild)fire is determined more by the details of construction than by the materials used in the walls."

G.J. Barrow, after the 1944 Beaumaris Fire in Australia

A Different Approach with Neighbors

http://calfire-forestry.maps.arcgis.com/apps/PublicInformation



Wildfire Exposures: Radiant Heat

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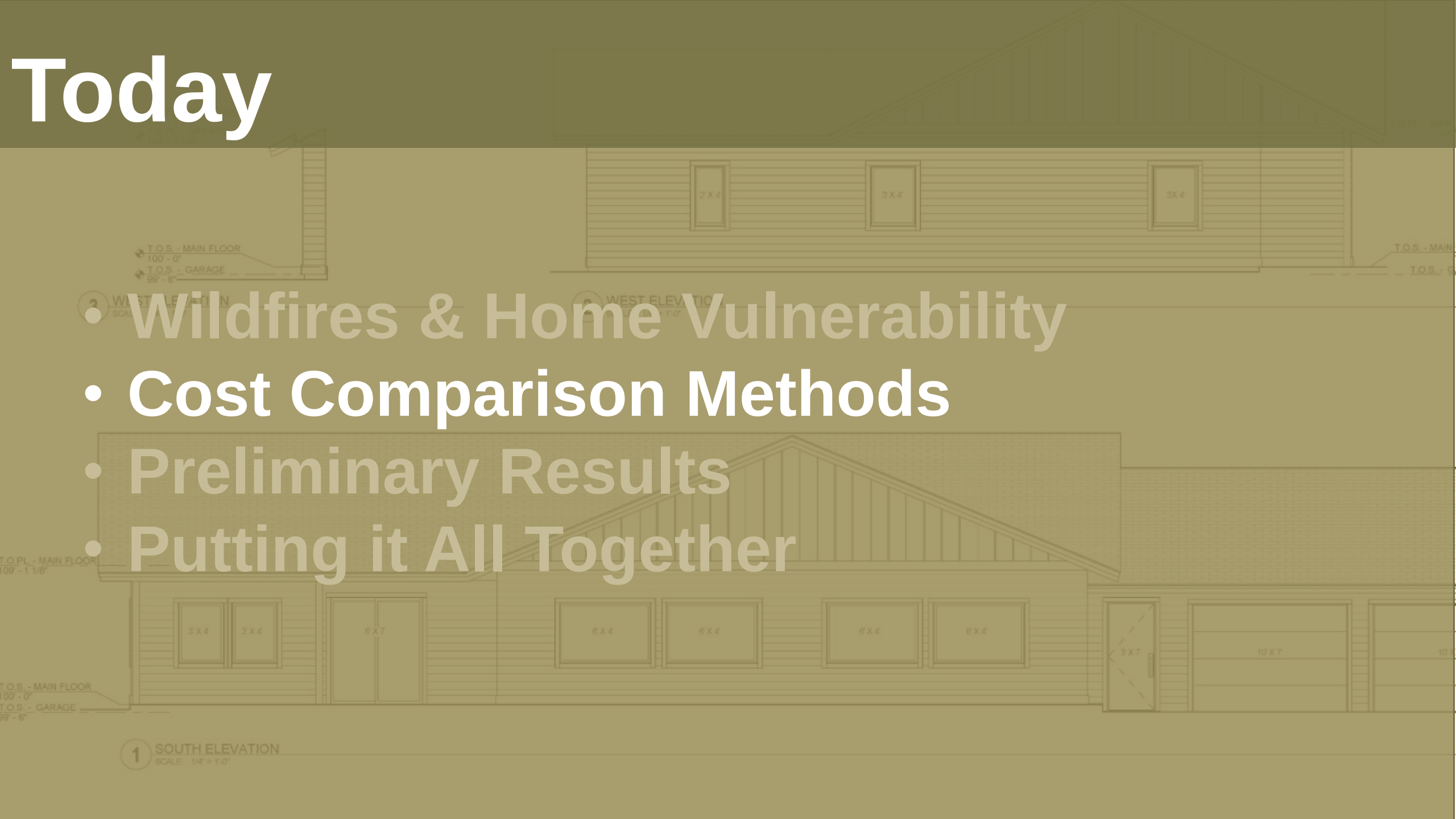


Baseline Home

- Park County, MT
- 3 bedroom
- 2500 sq. ft.
- Approx. $350,000

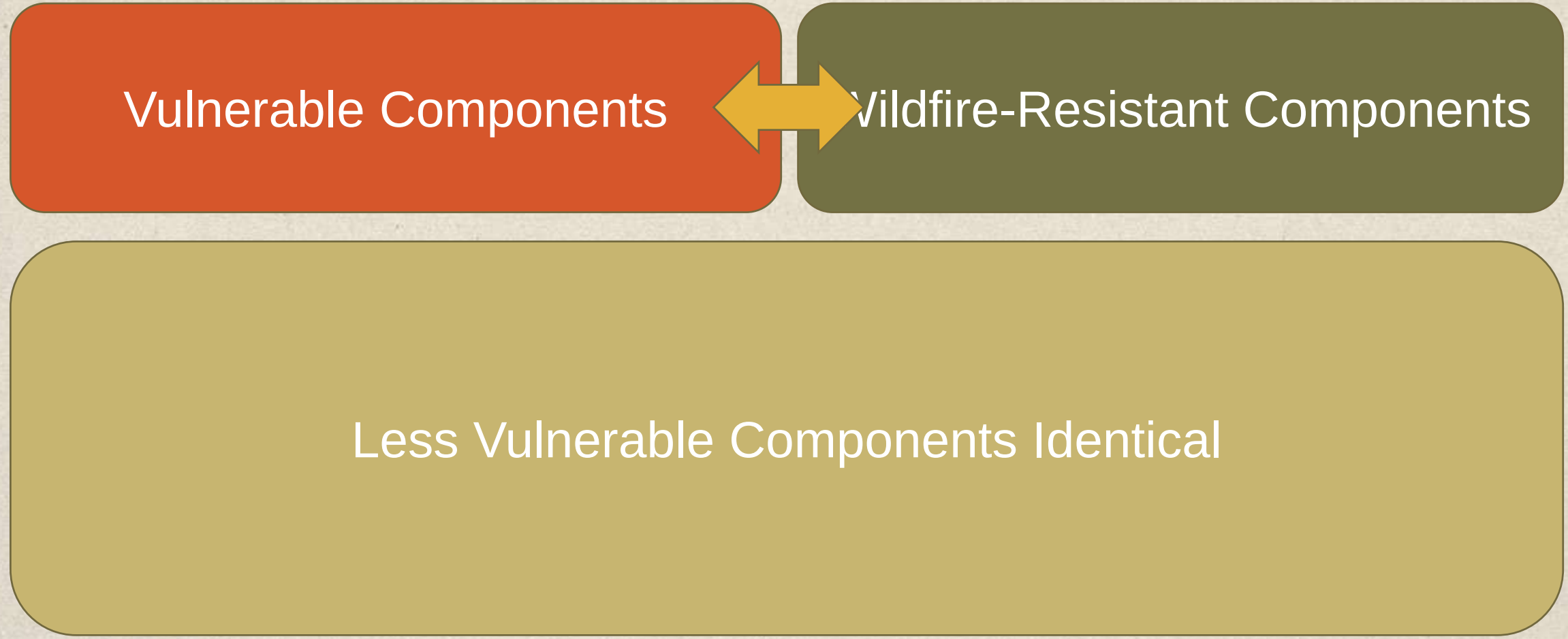
Baseline Home

Wildfire-Resistant Home

Less Vulnerable Components Identical

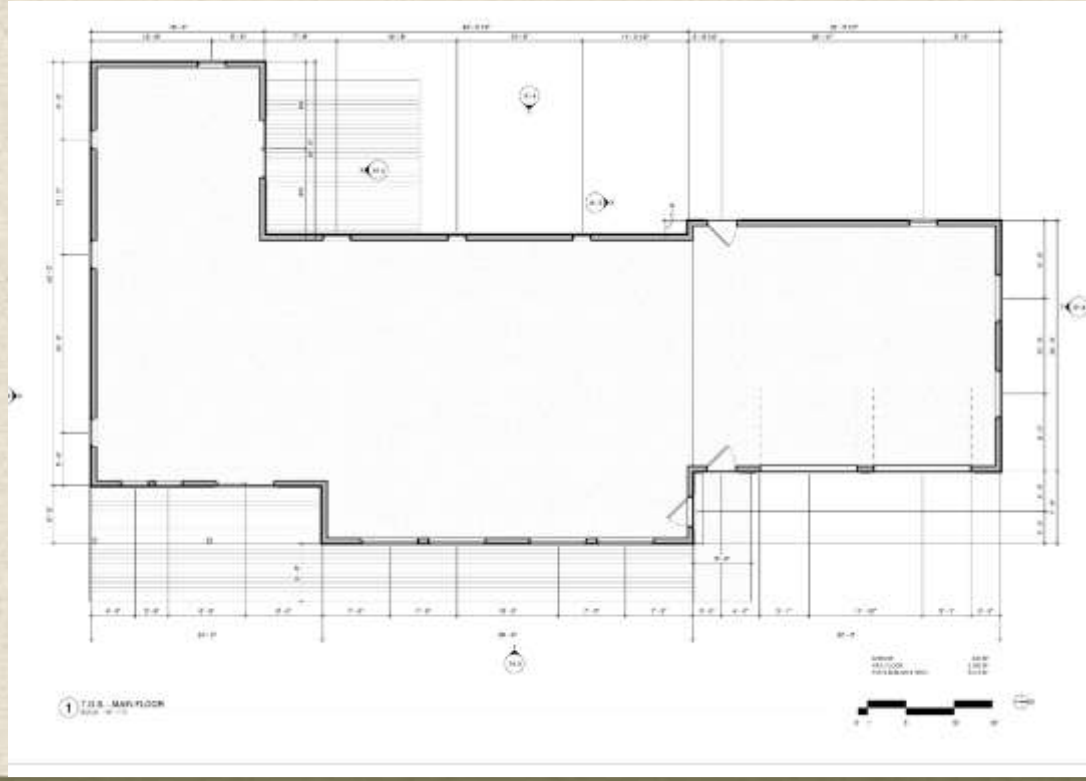
Baseline Home

Wildfire-Resistant Home



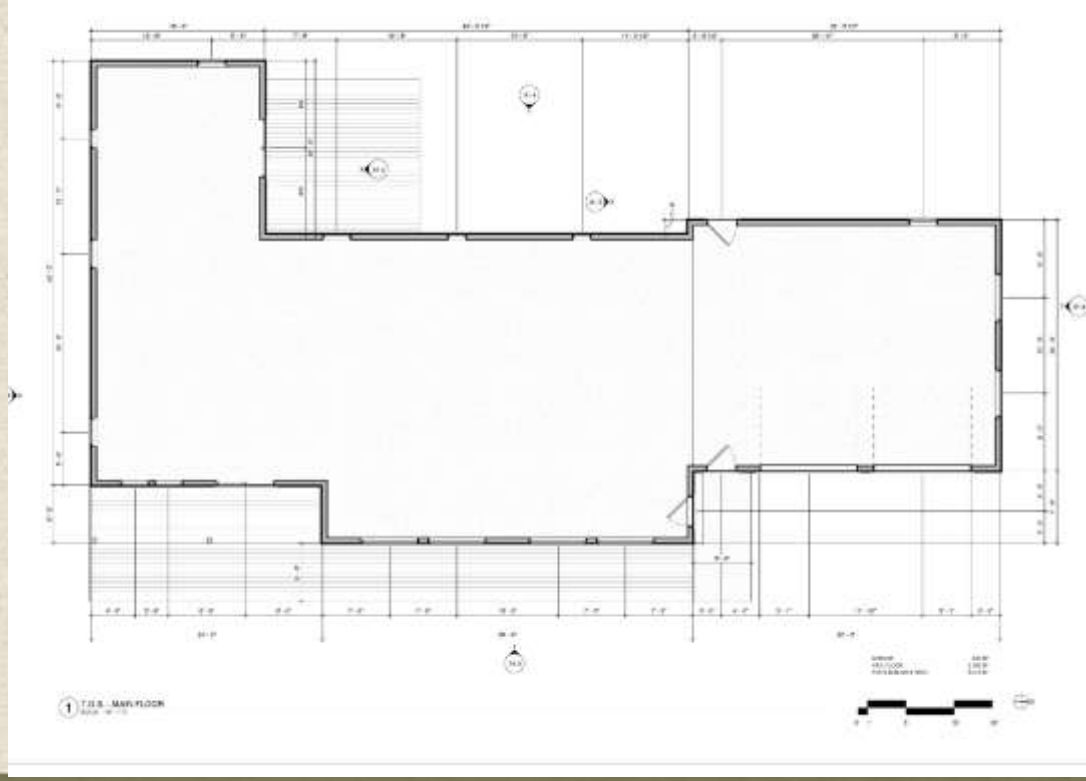
Areas of Vulnerability

1. Roof



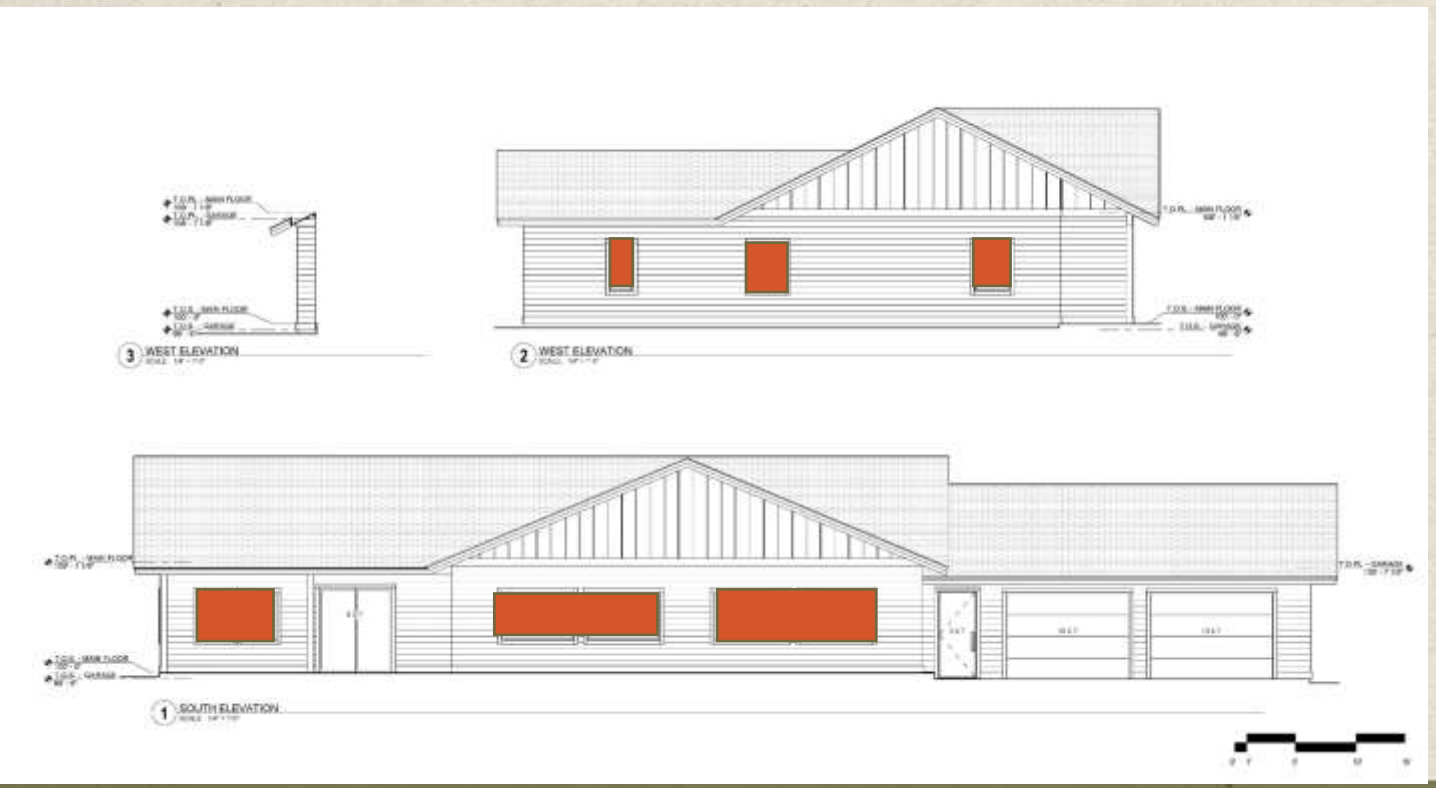
Areas of Vulnerability

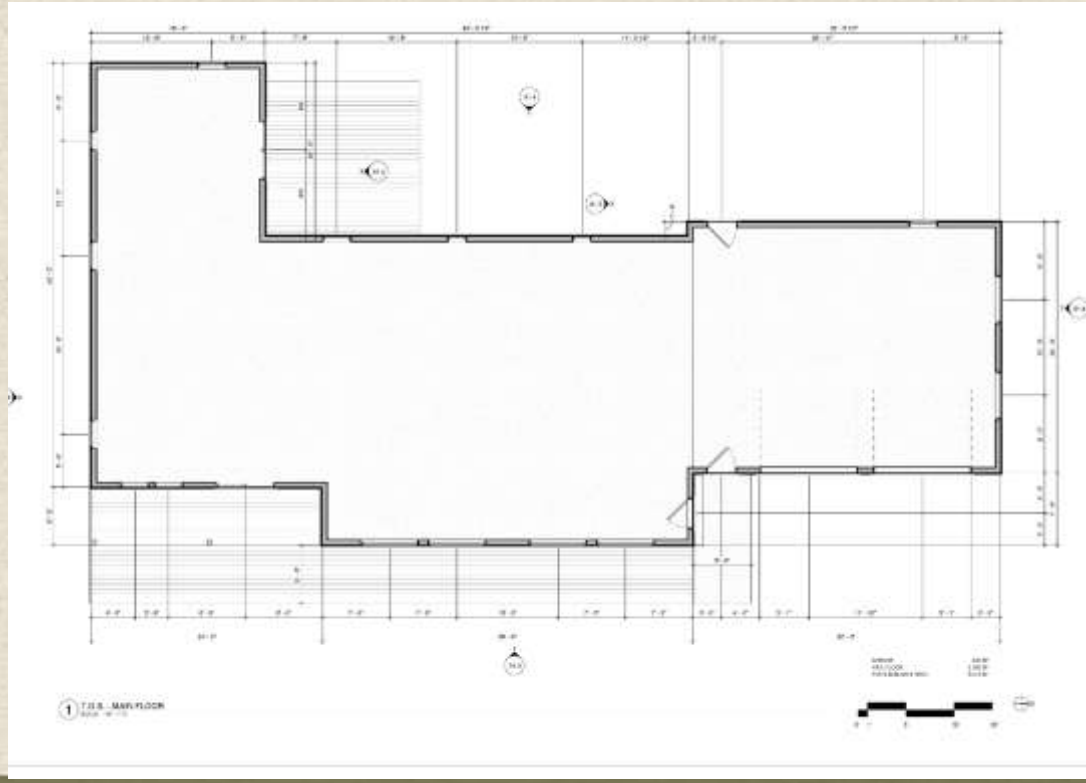
1. Roof
2. Exterior Walls



Areas of Vulnerability

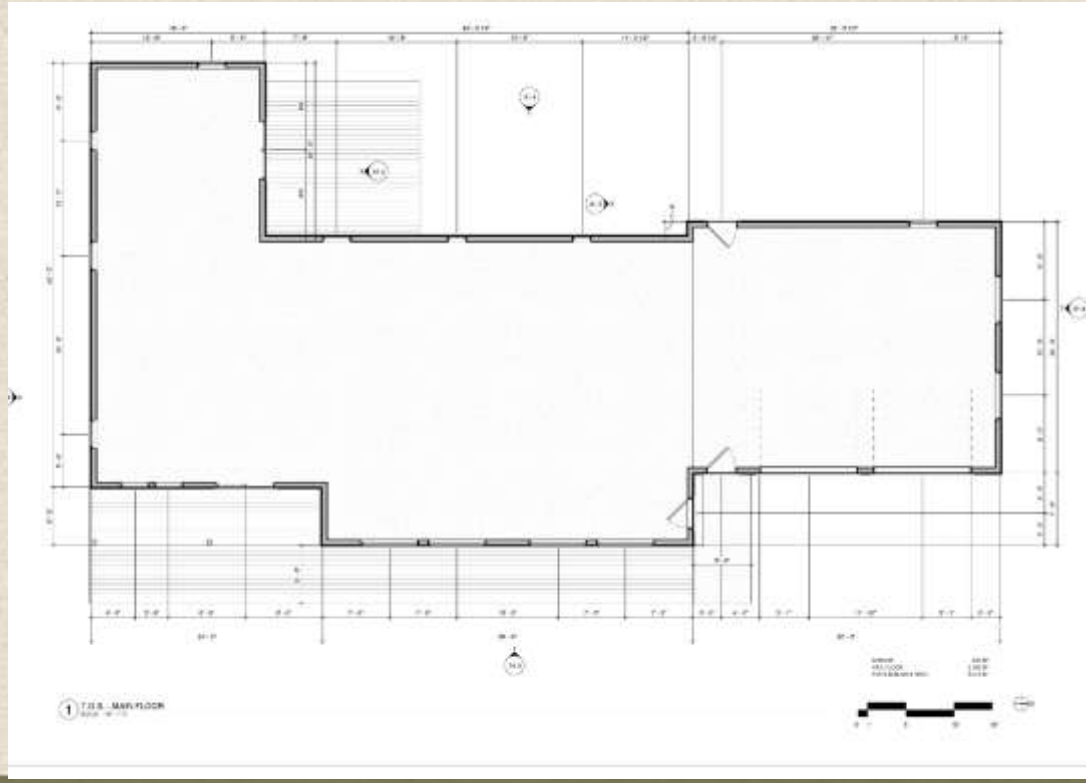
1. Roof
2. Exterior Walls
3. Windows





Areas of Vulnerability

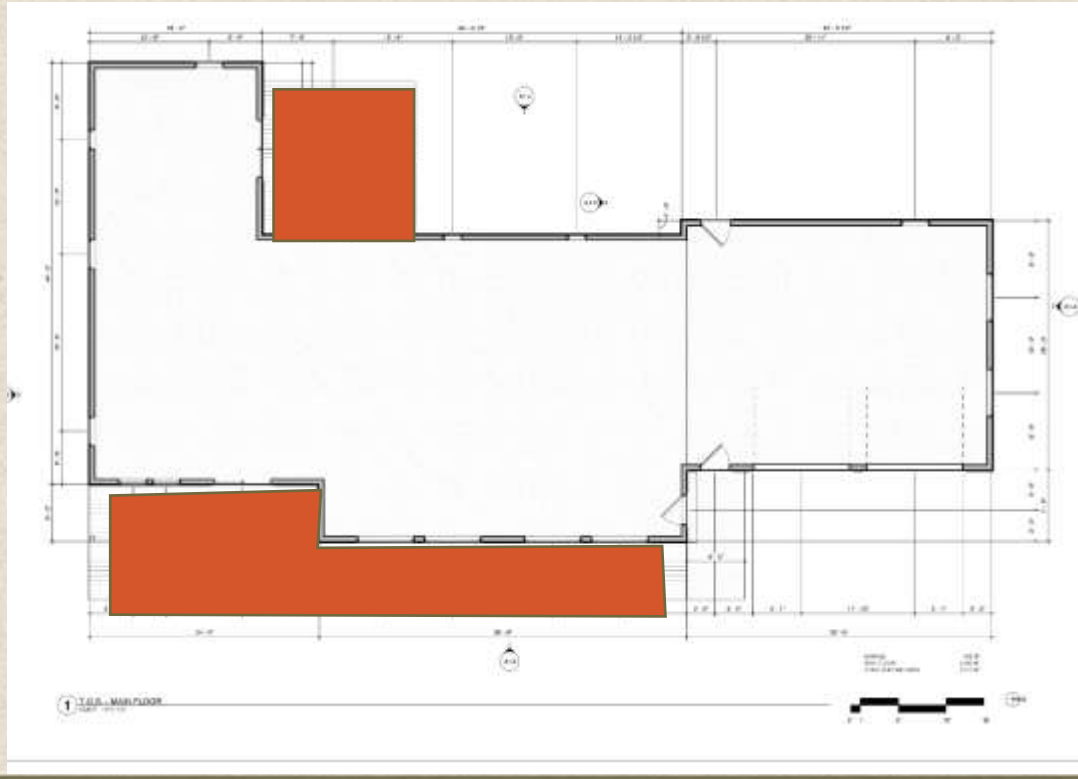
1. Roof
2. Exterior Walls
3. Windows
4. Doors



Areas of Vulnerability

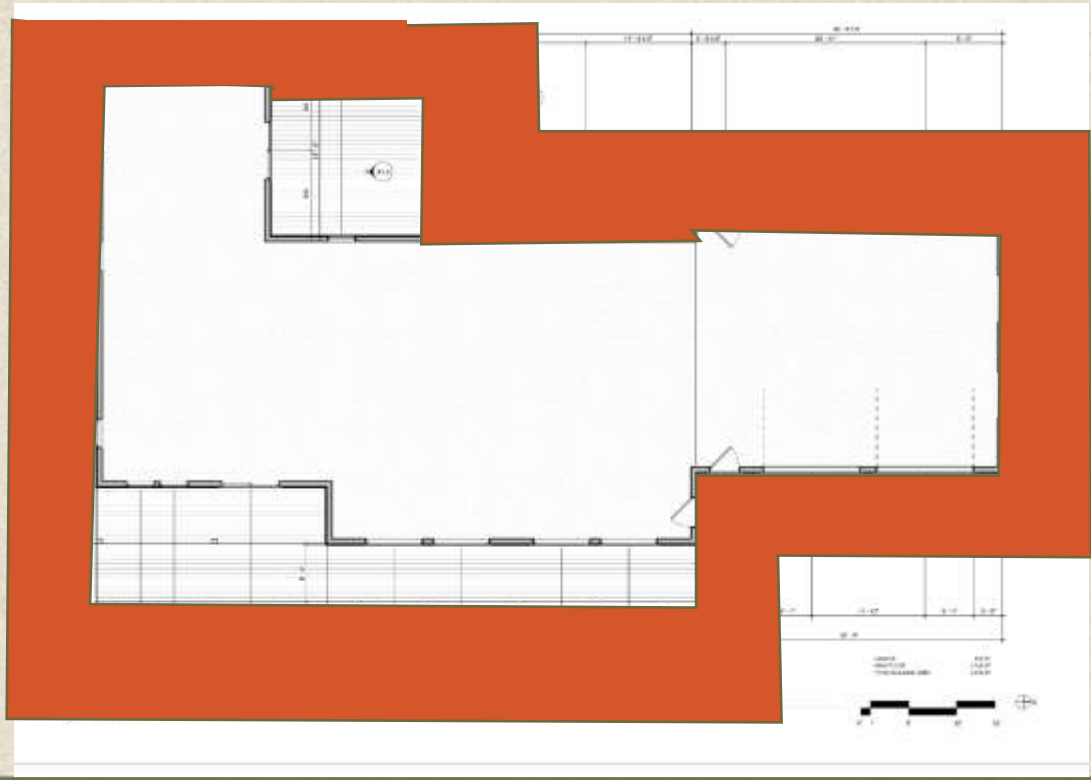
1. Roof
2. Exterior Walls
3. Windows
4. Doors

5. Deck



Areas of Vulnerability

1. Roof
2. Exterior Walls
3. Windows
4. Doors
5. Deck
6. Home Ignition Zone



Cost Comparisons Using RSMeans

- National database
- Regional multipliers
- Includes labor, overhead & profit
- Allows consistency
- Limits localized variability

Today

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- Cost Comparison Methods
- **Preliminary Results**
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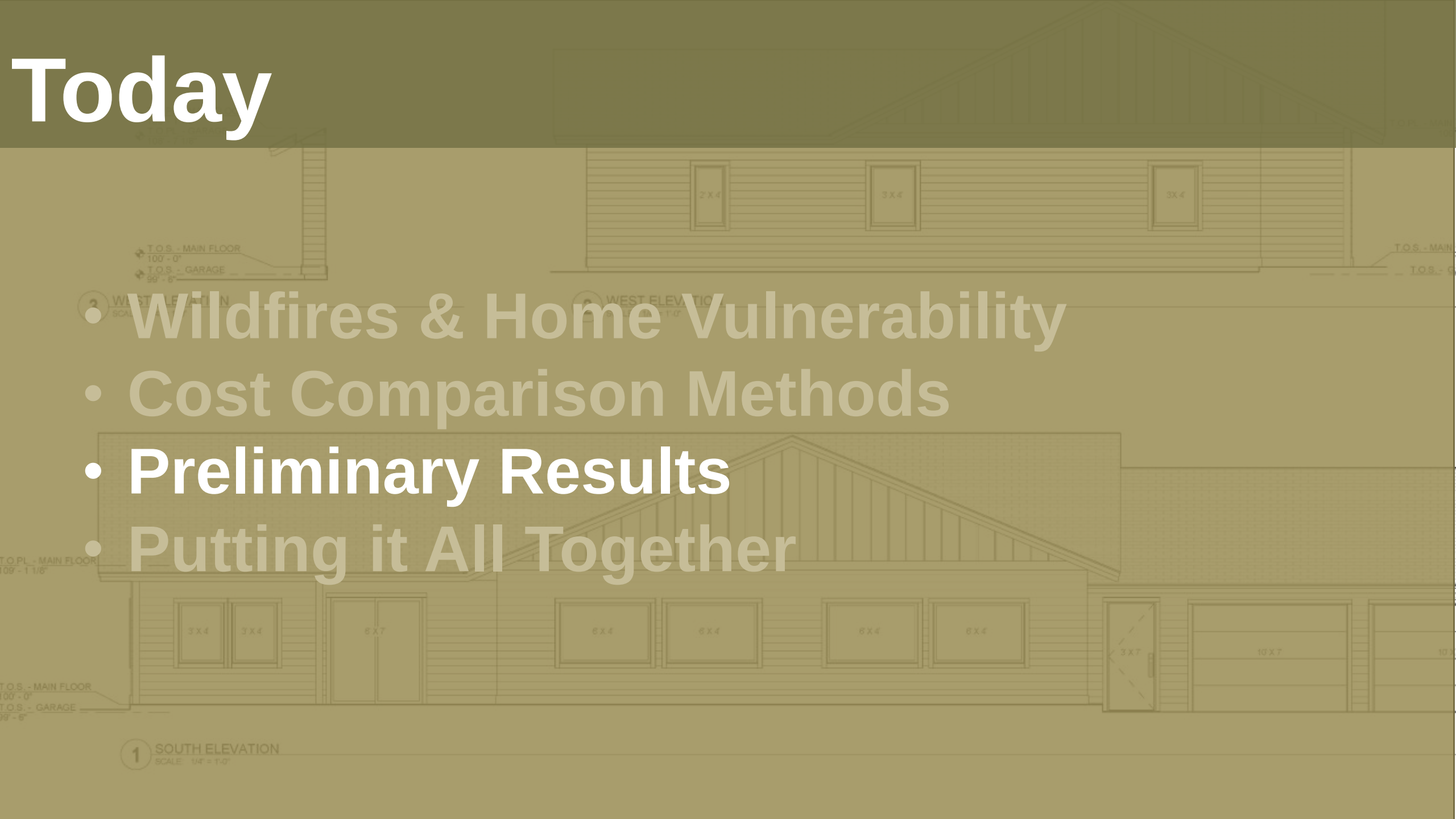
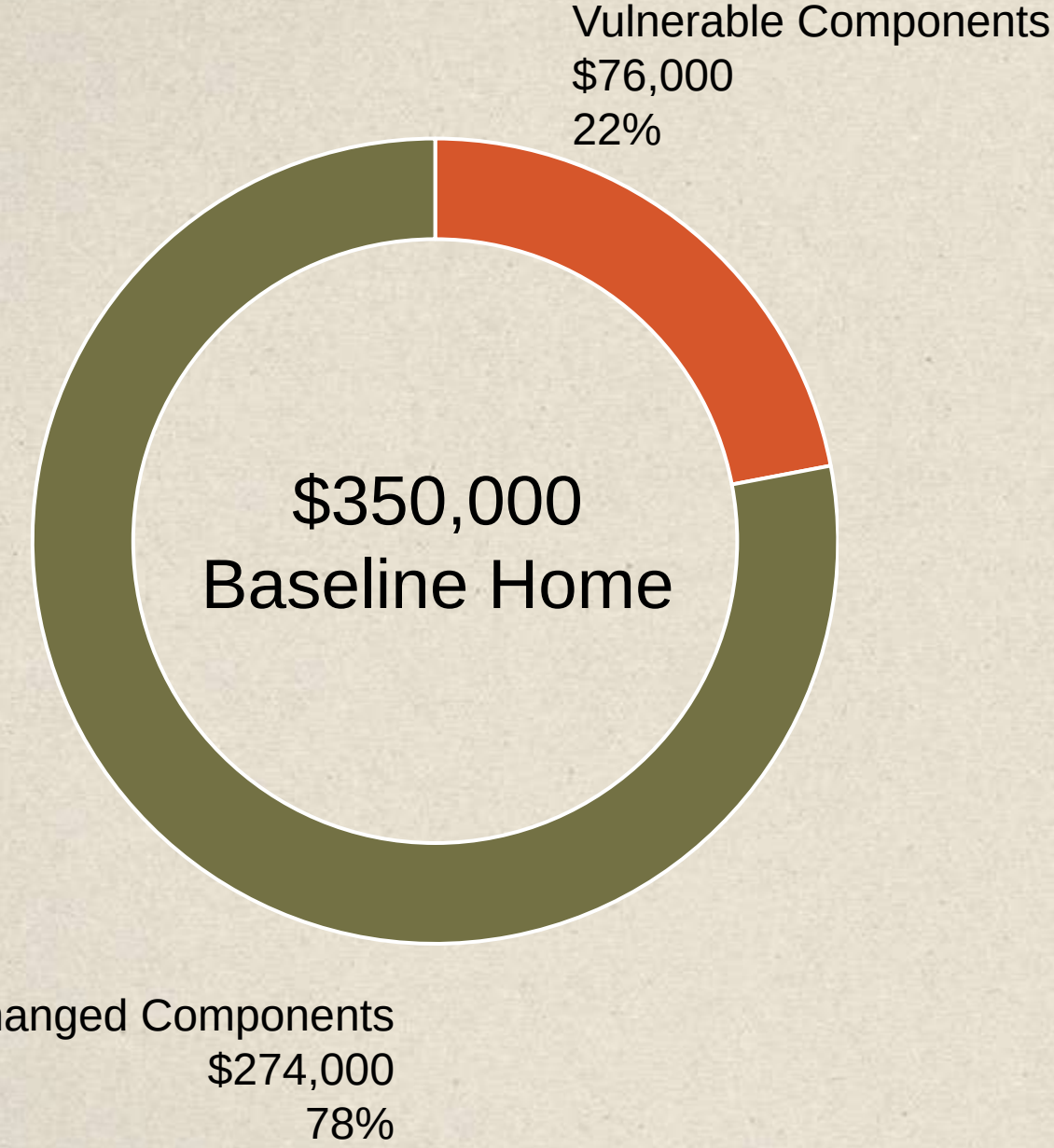
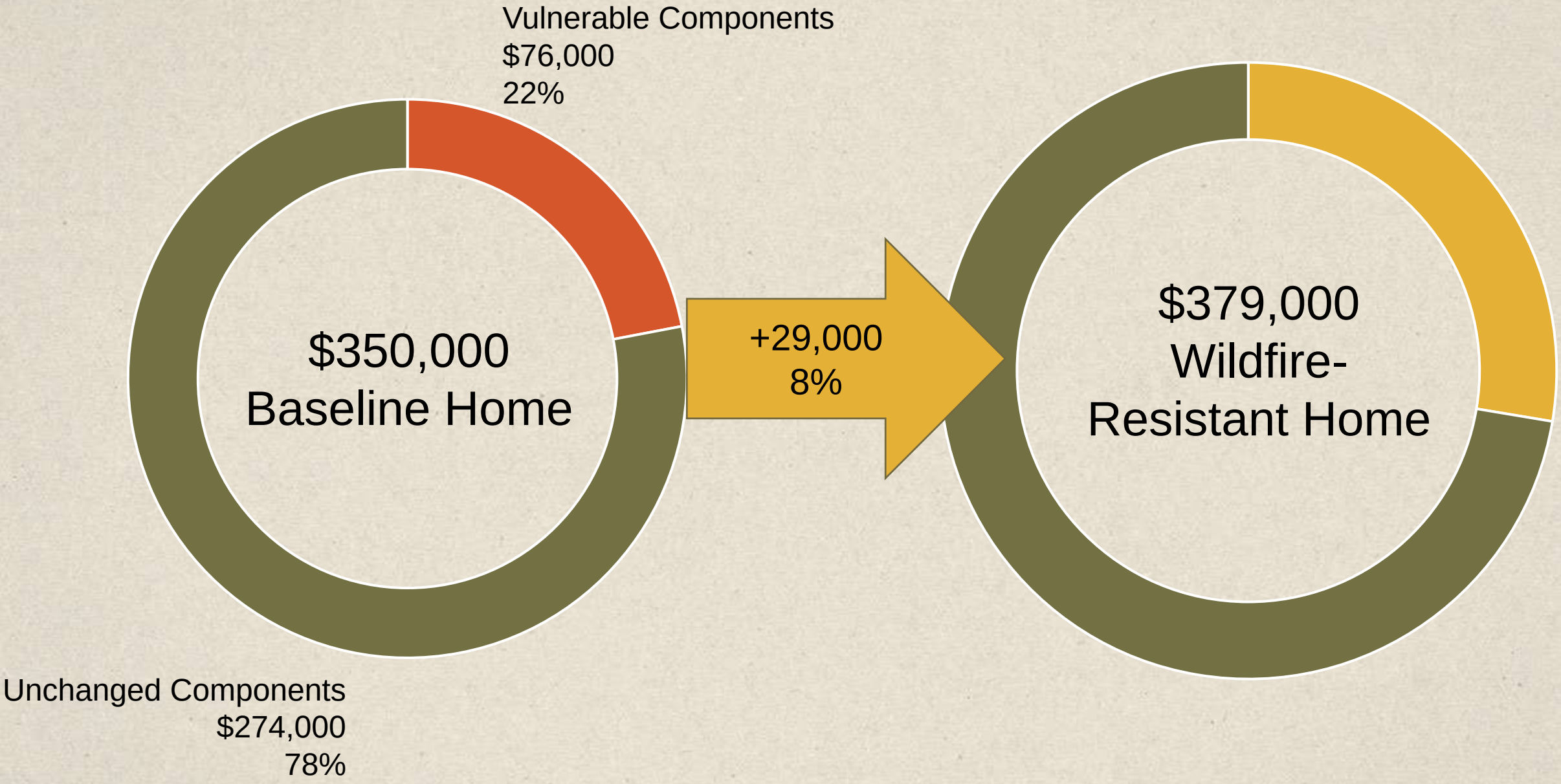
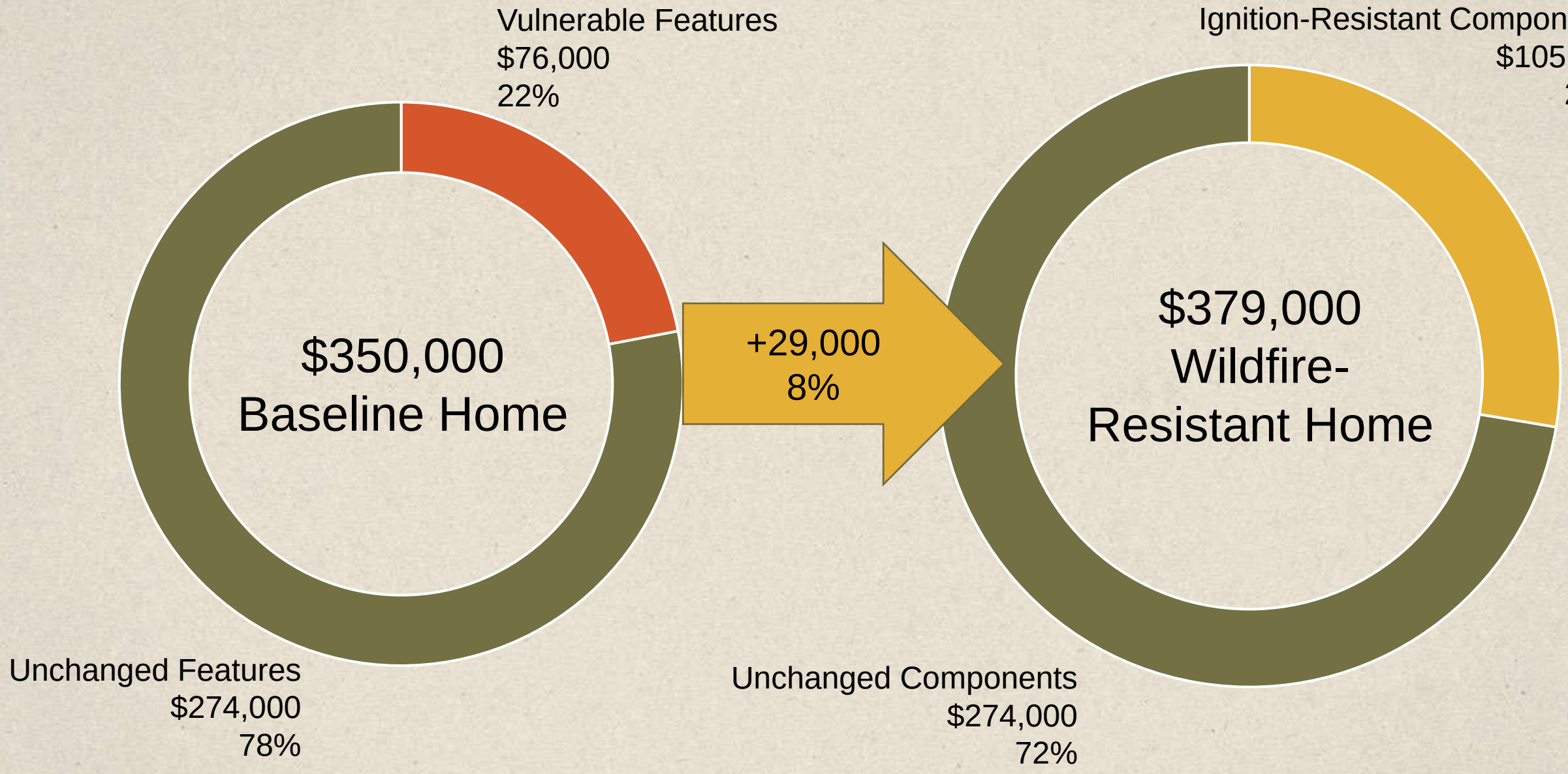



$350,000
Baseline Home

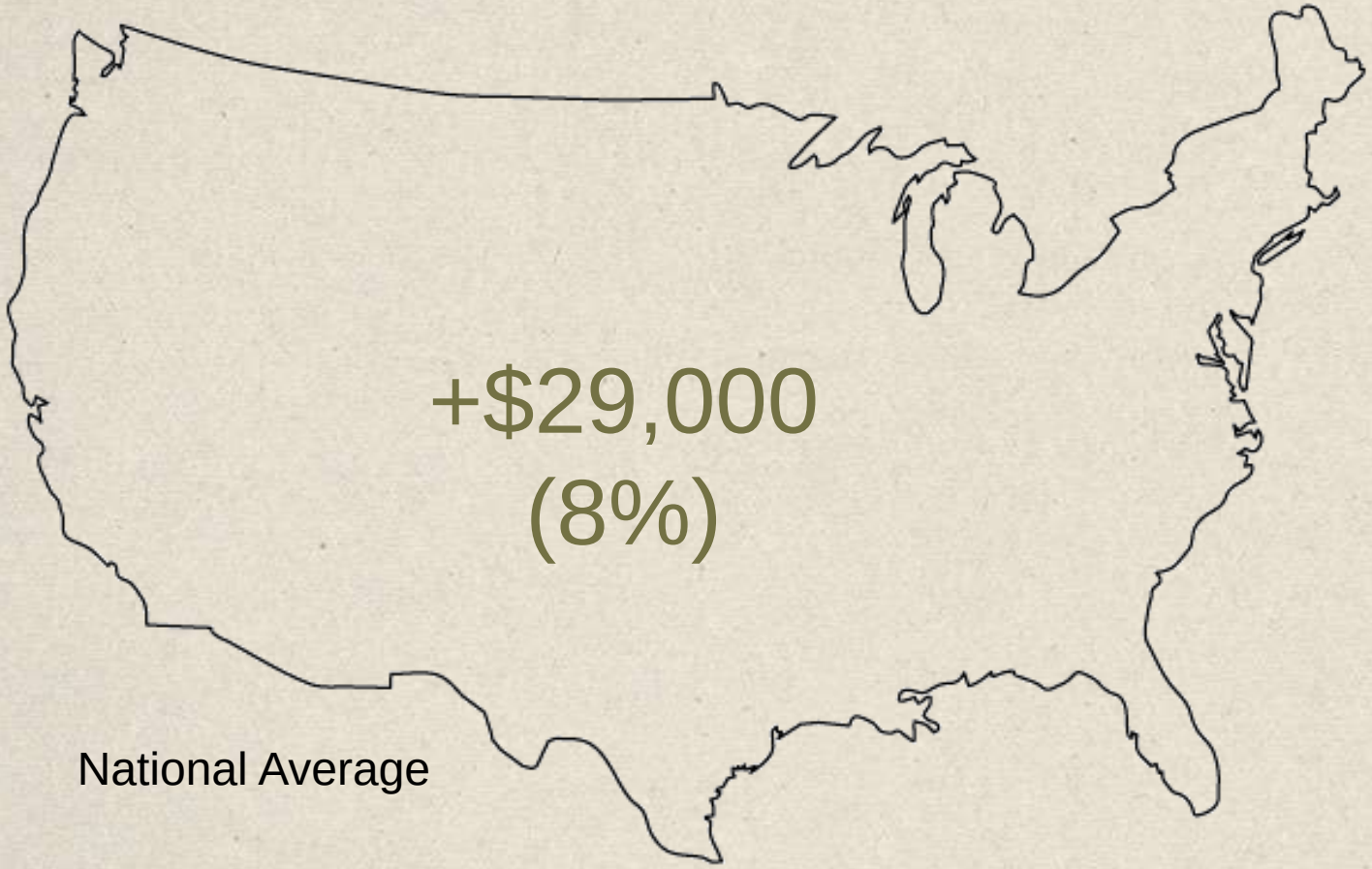

Vulnerable Components
$76,000
22%
$350,000
Baseline Home
Unchanged Components
$274,000
78%


Vulnerable Components
$76,000
22%
$350,000
Baseline Home
+29,000
8%
$379,000
Wildfire-
Resistant Home
Unchanged Components
$274,000
78%

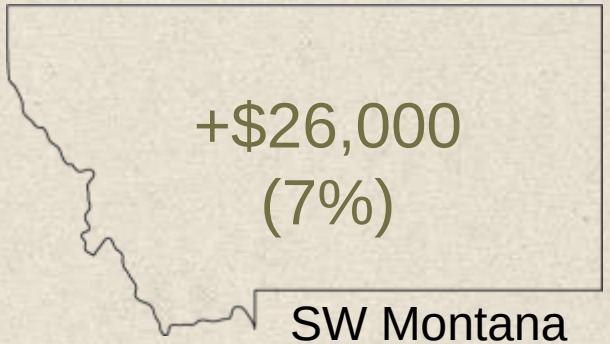

Vulnerable Features
$76,000
22%
$350,000
Baseline Home
Unchanged Features
$274,000
78%
+29,000
8%
Ignition-Resistant Components
$105,000
28%
$379,000
Wildfire-
Resistant Home
Unchanged Components
$274,000
72%

Total Difference

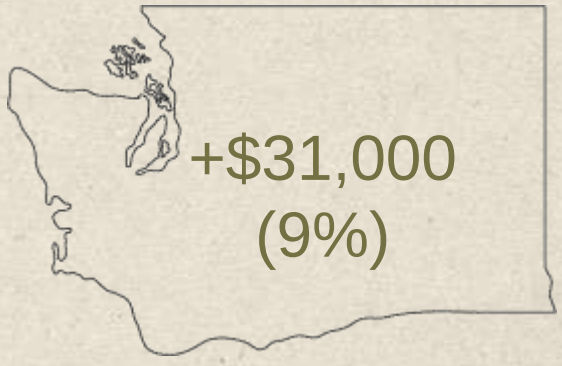
Baseline : Wildfire-Resistant



National Average



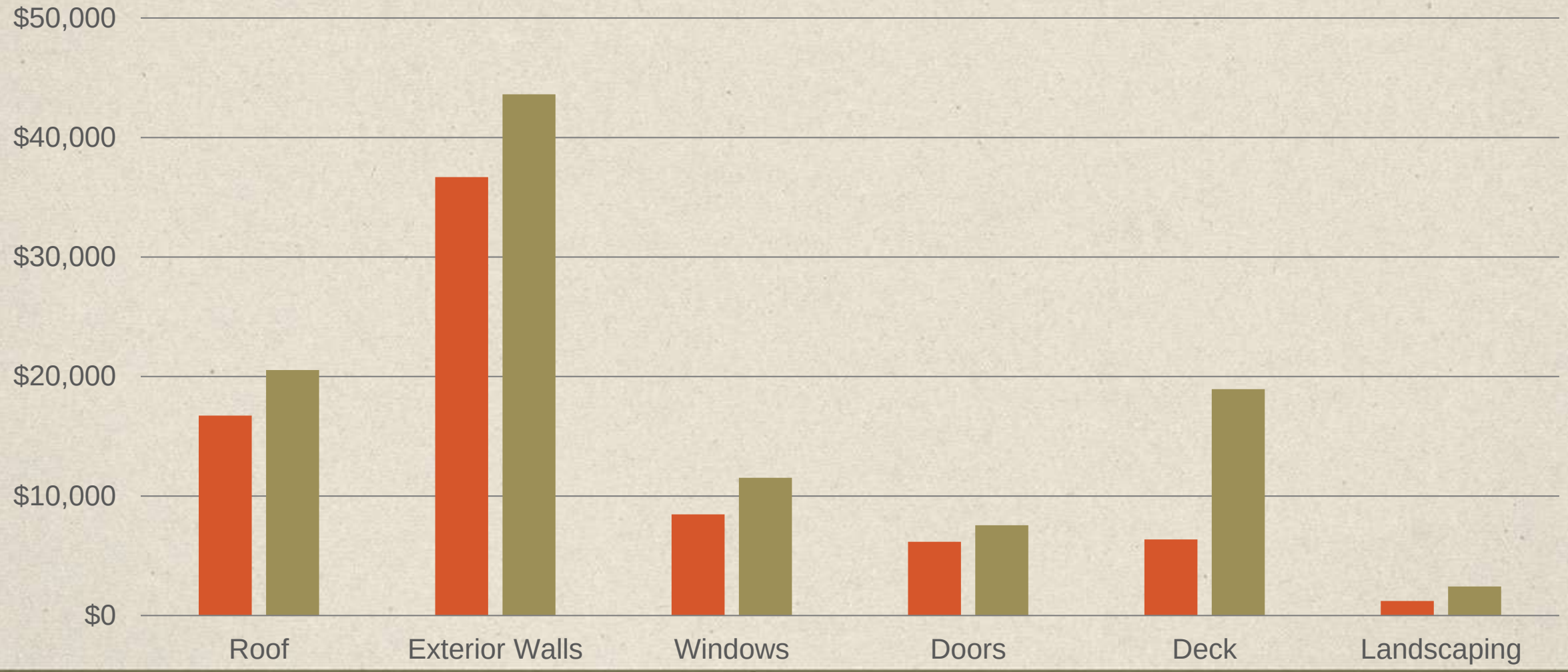
SW Montana



Wenatchee, WA

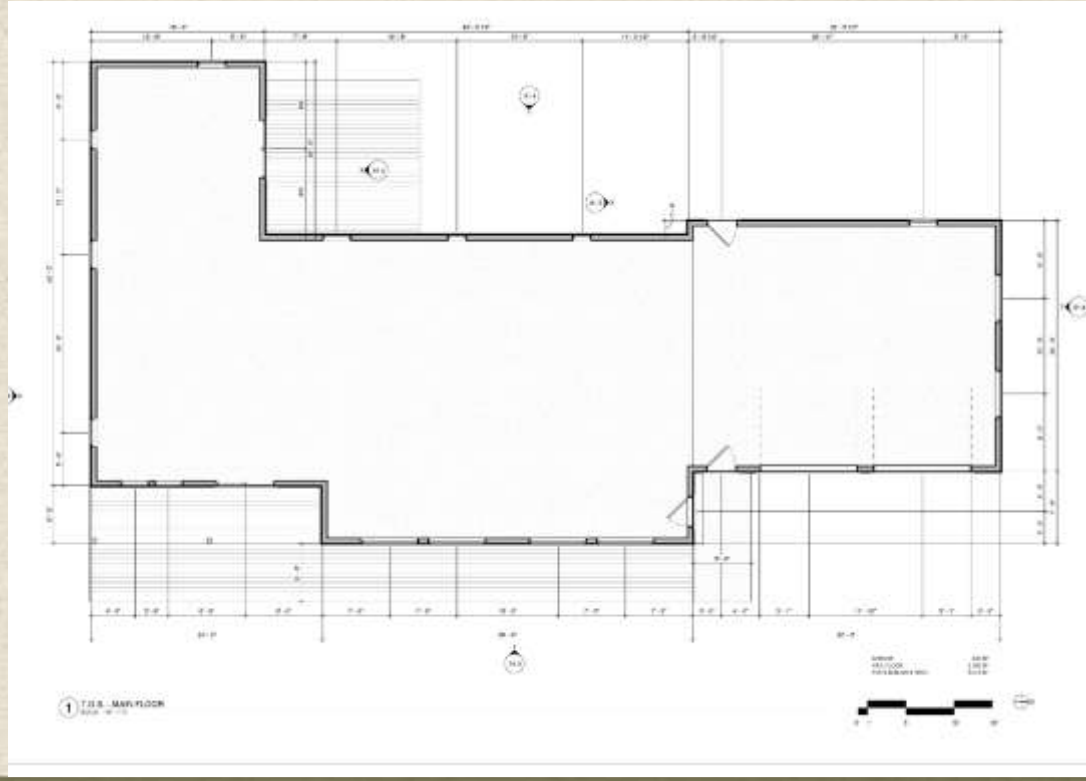
Difference by Component

Baseline : Wildfire-Resistant

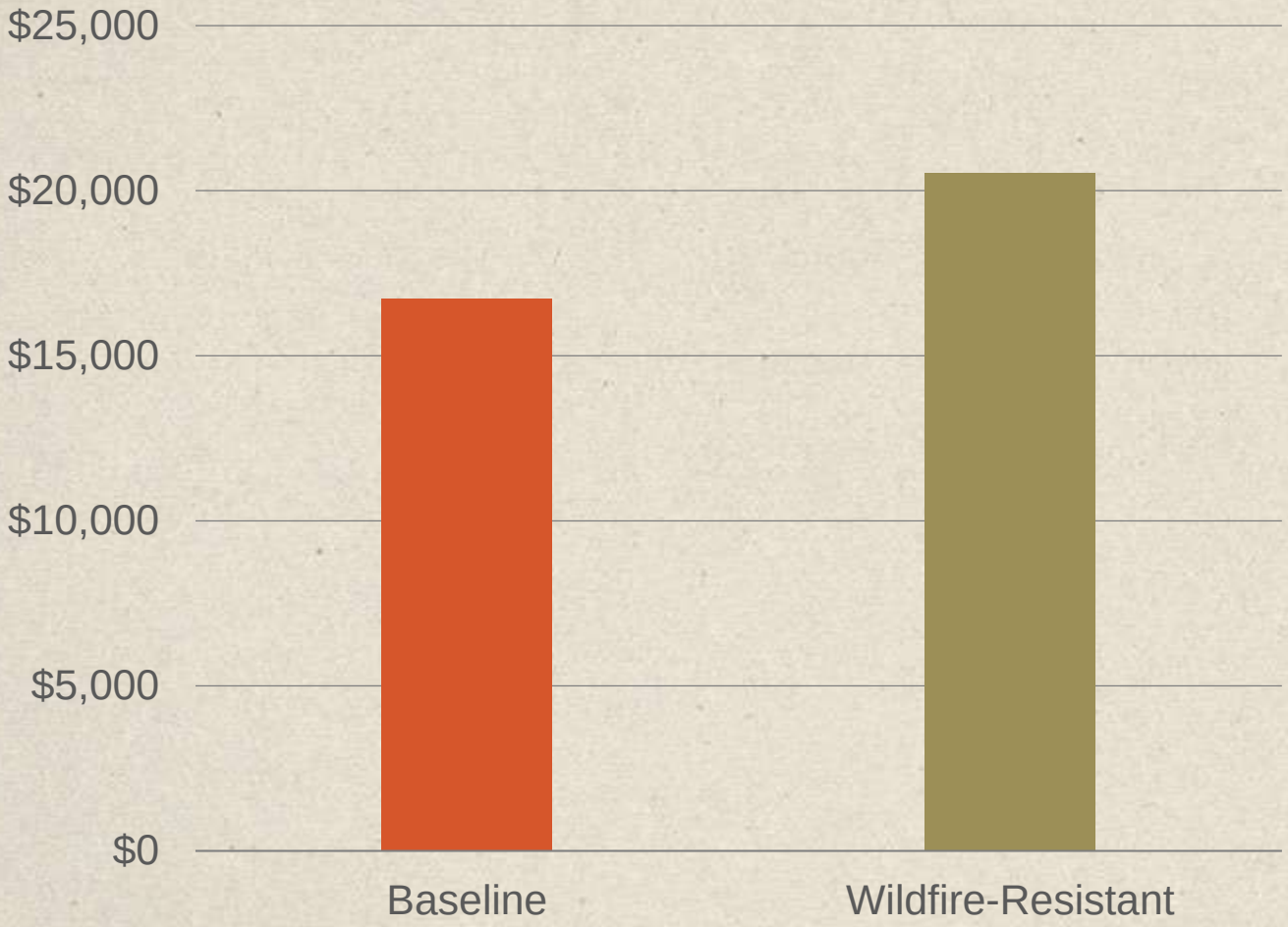


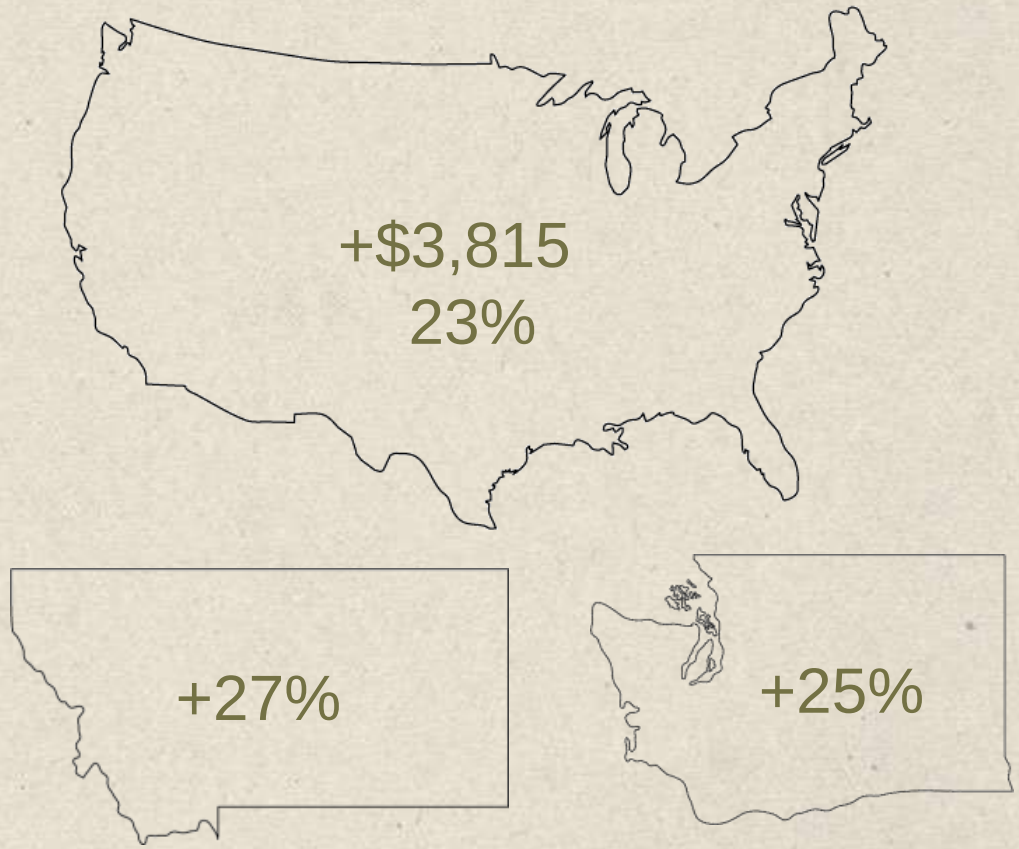
Roof


3 WEST ELEVATION
2 WEST ELEVATION
1 SOUTH ELEVATION

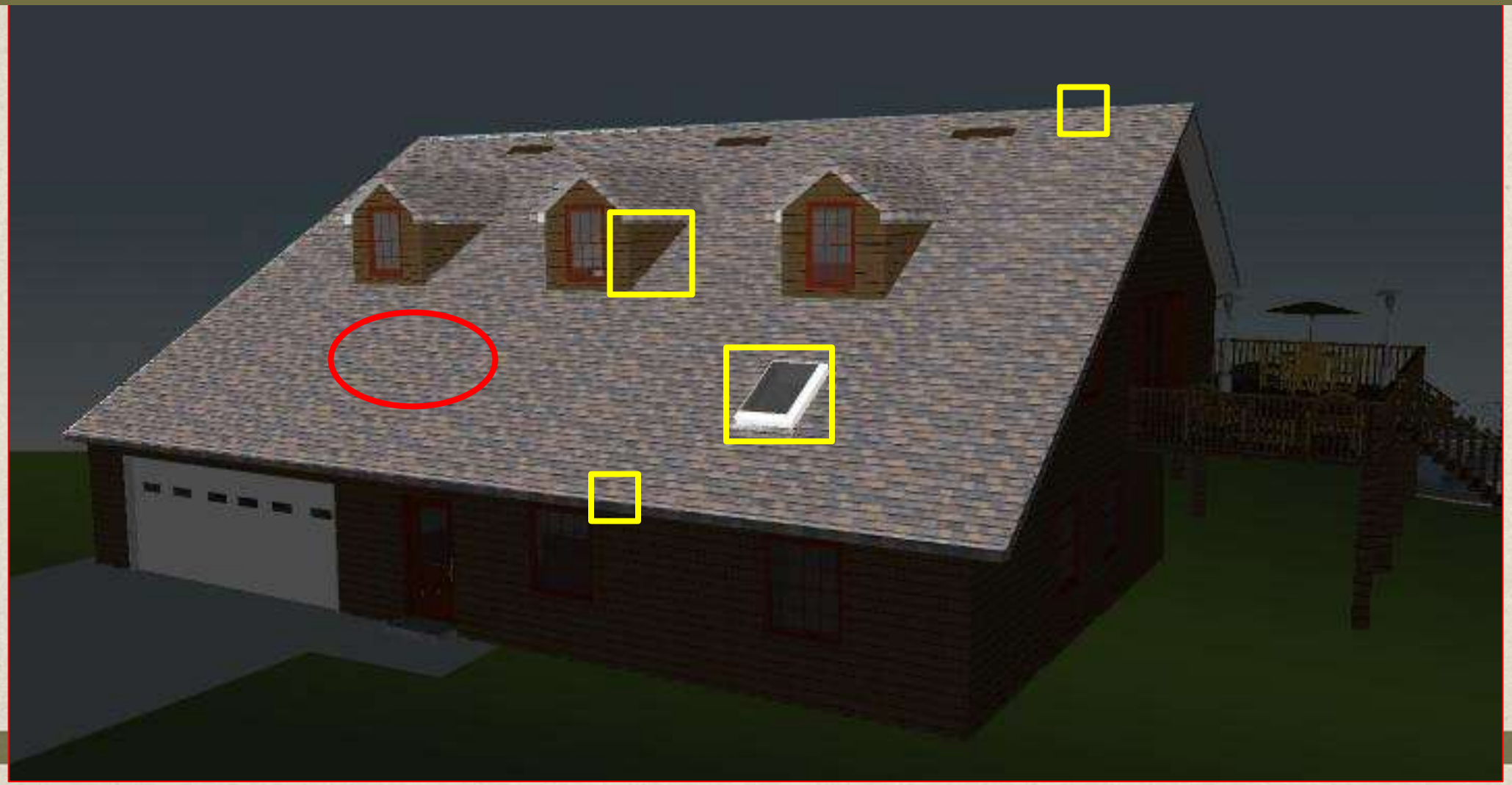

1 T.O.S. - MAIN FLOOR

Roof

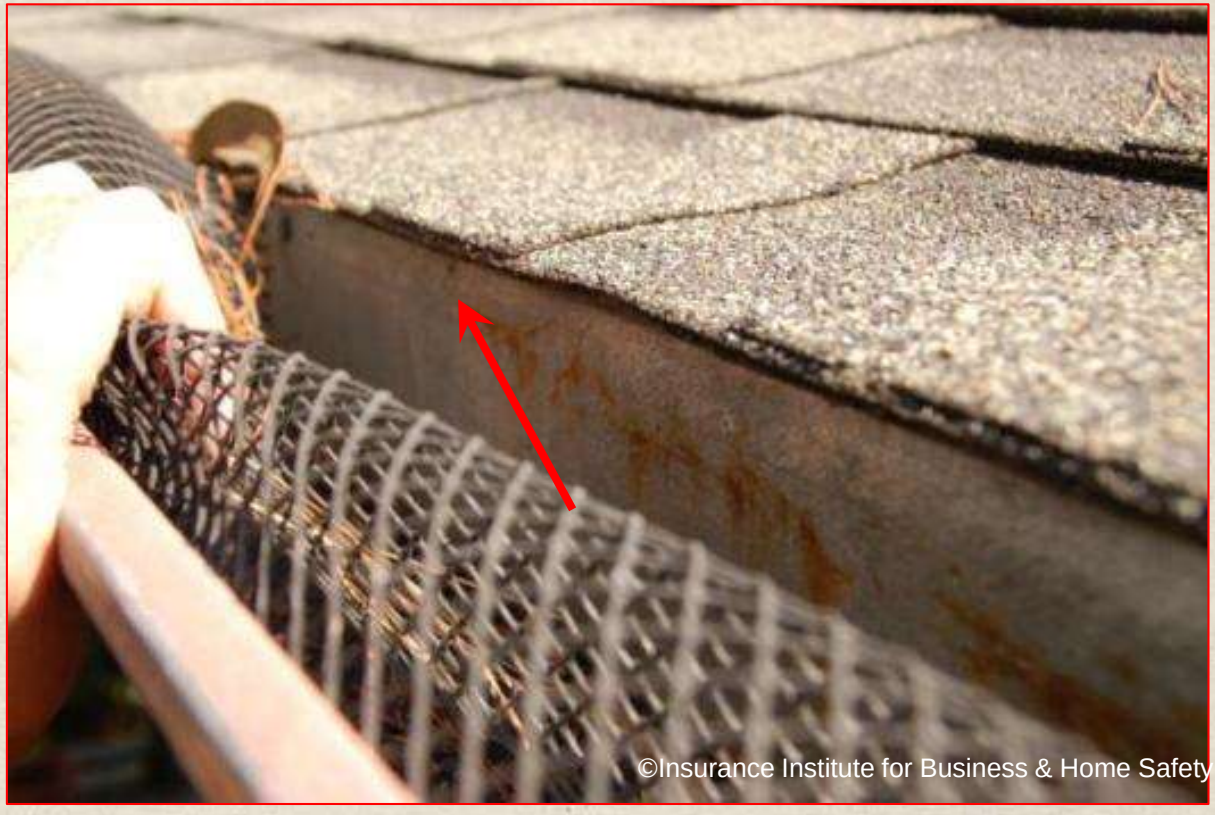

$25,000
$20,000
$15,000
$10,000
$5,000
$0
Baseline
Wildfire-Resistant


+$3,815
23%
+27%
+25%

Roof

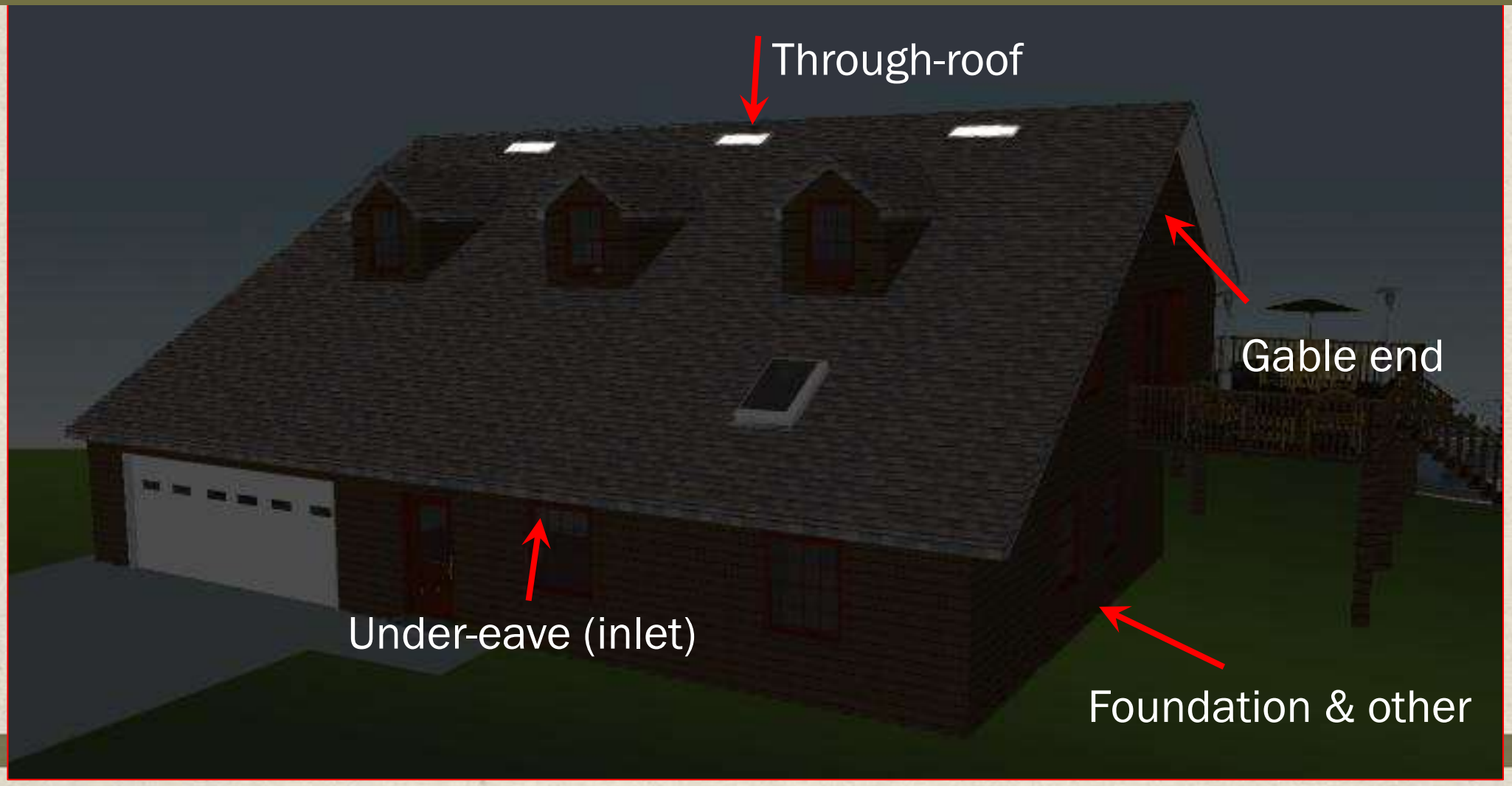


Roof - Drip Edge



Roof Edge - Gutter

Vents



Vents – Under-eave

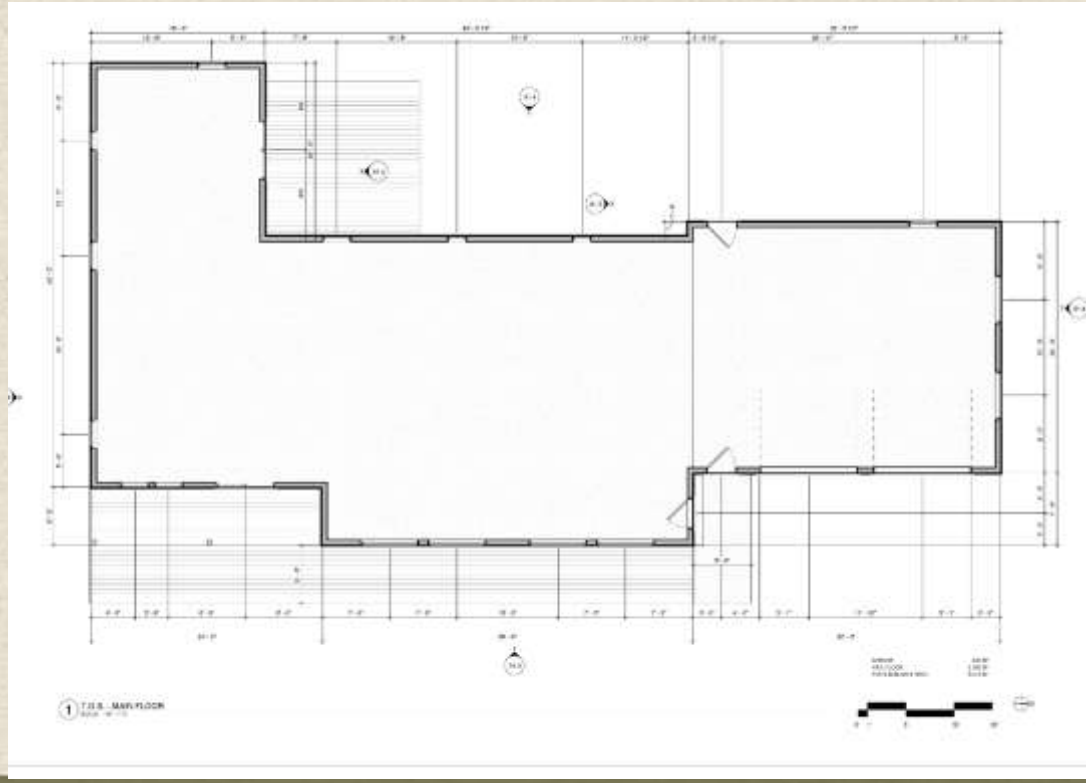
Vents – Mesh Size

Vents – California's Chapter 7A

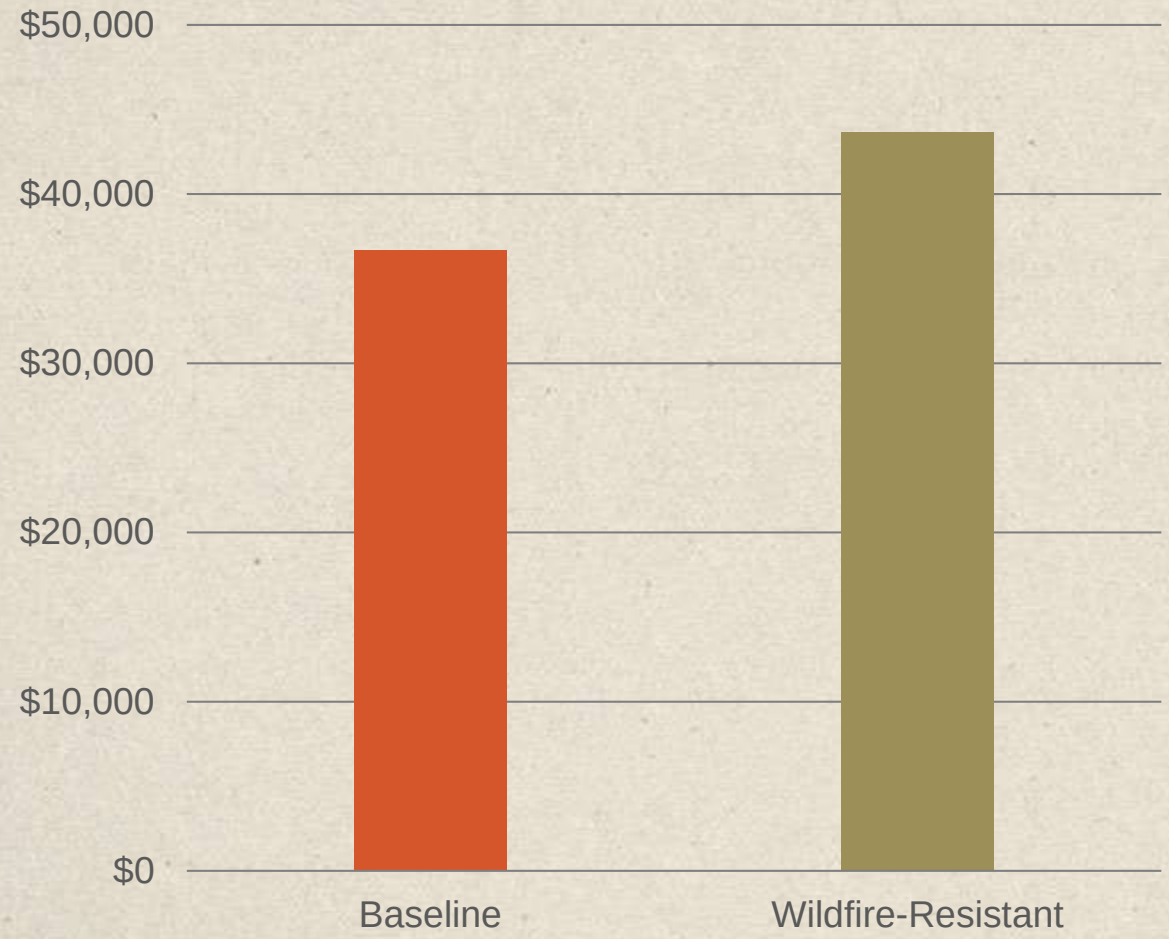
Vents – External Baffle

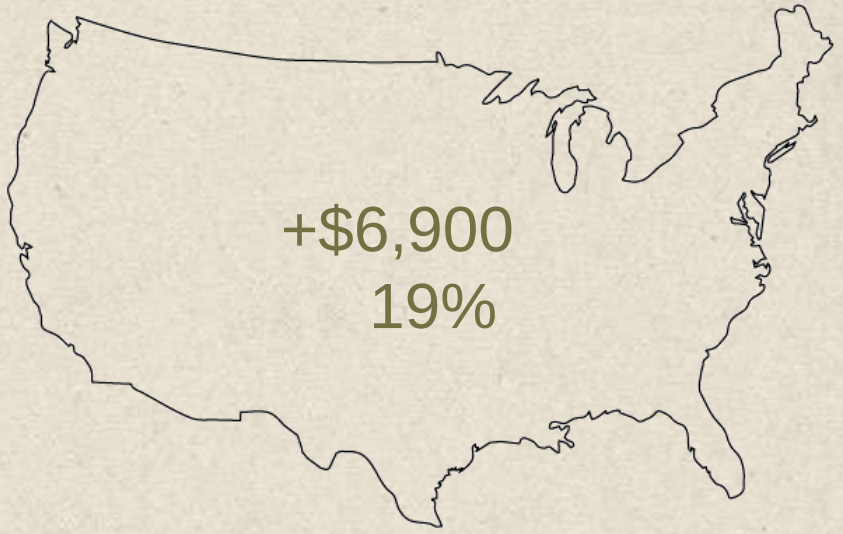
Vents – Debris Accumulation

Exterior Walls

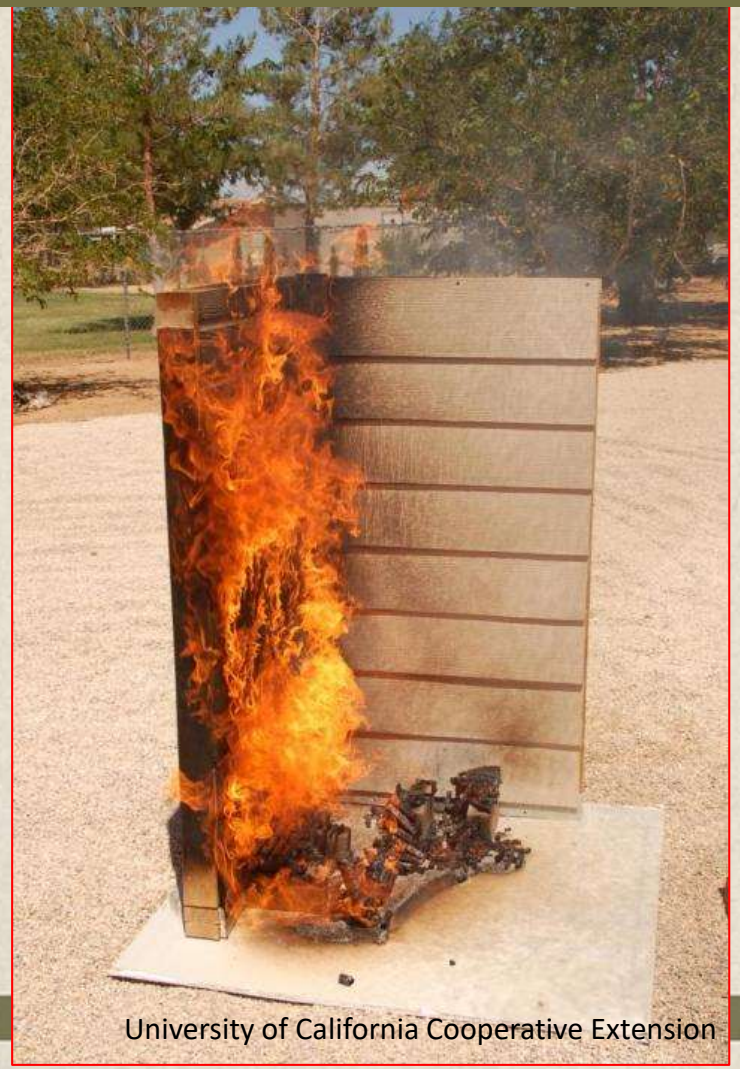


Exterior Walls





Exterior Walls


University of California Cooperative Extension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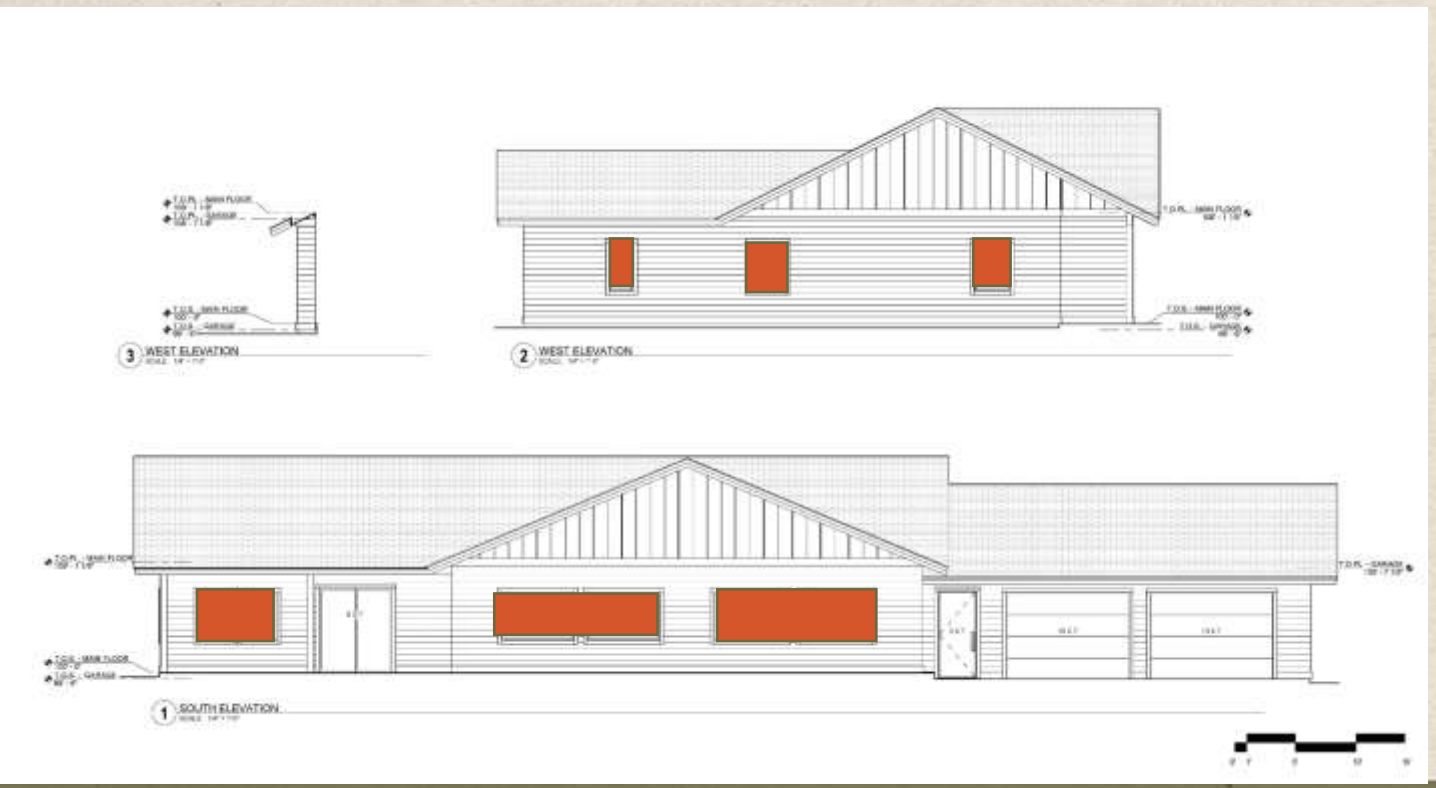
Soffited Eave


Stephen Quarles


Stephen Quarles

Windows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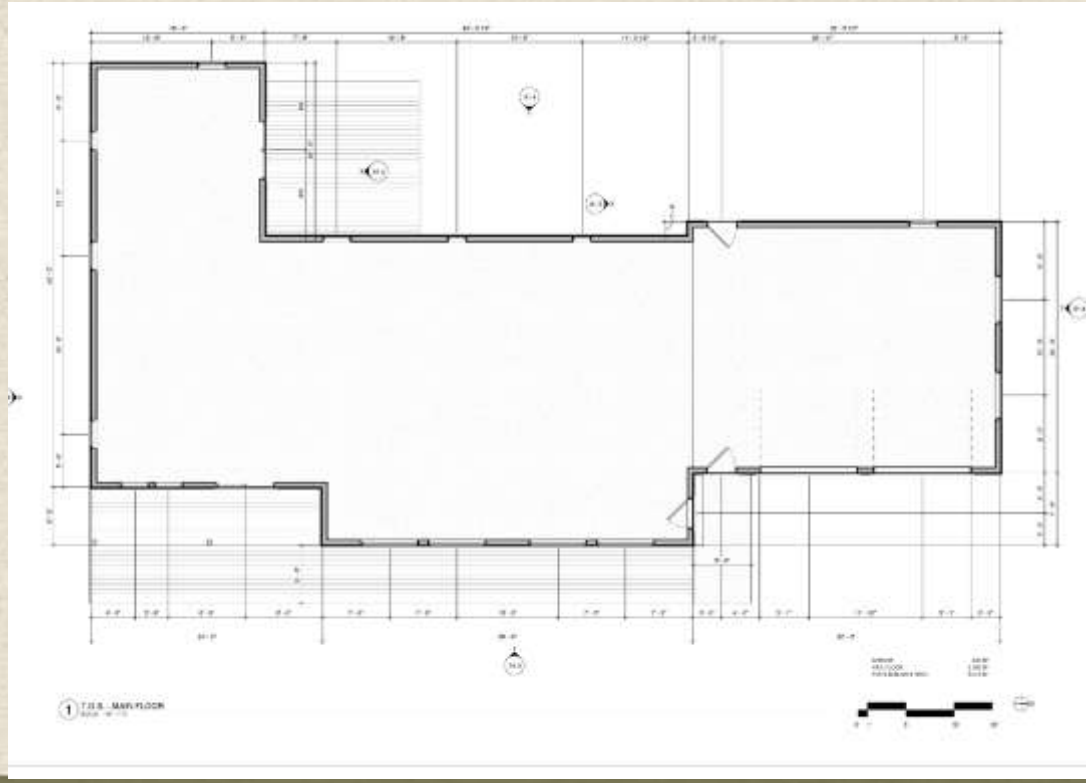
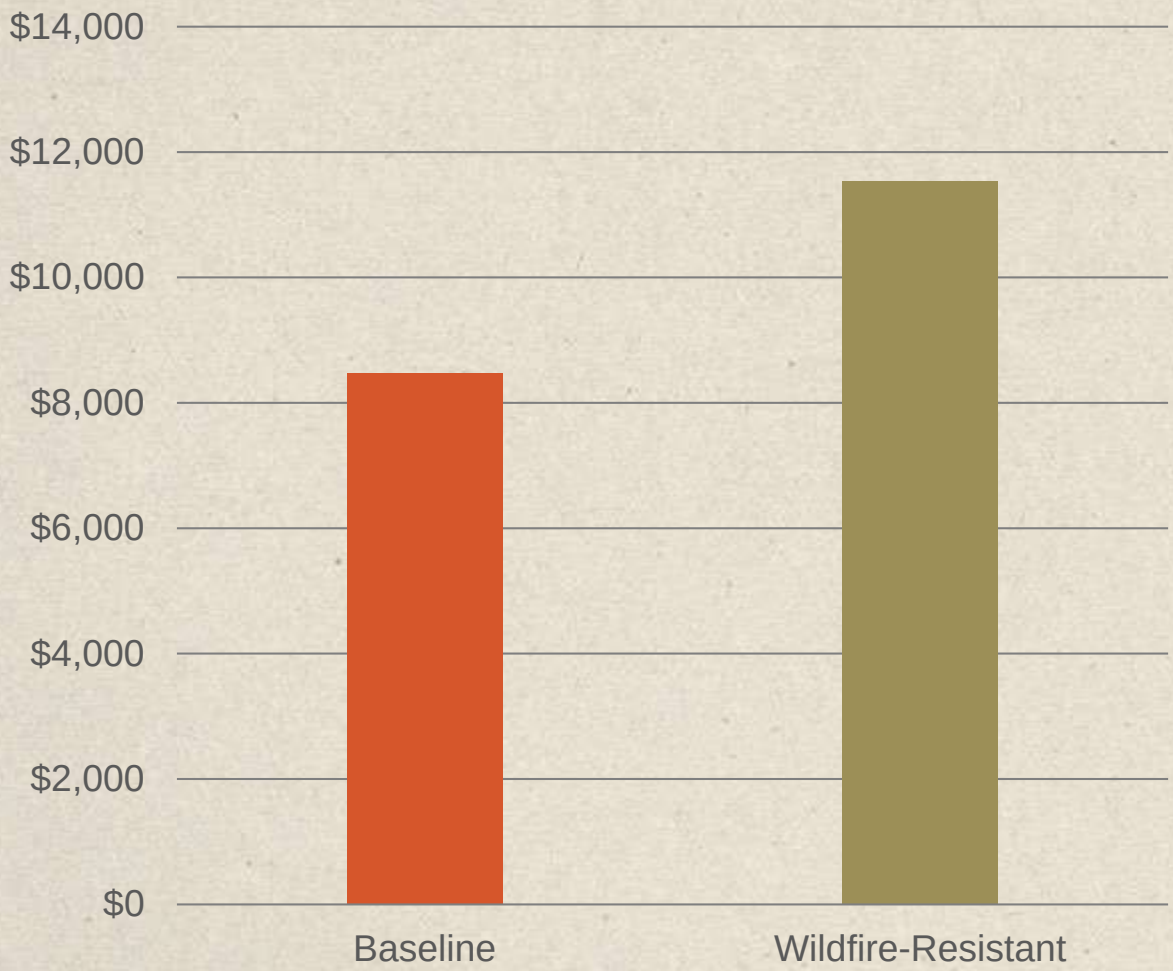
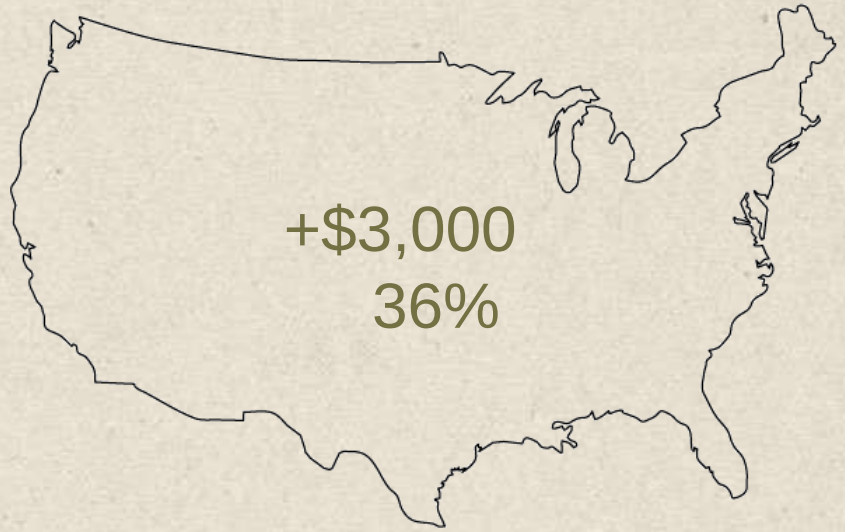

1 T.O.S. - MAIN FLOOR

Windows


$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
Baseline
Wildfire-Resistant


+$3,000
36%


+38%


+38%

Windows

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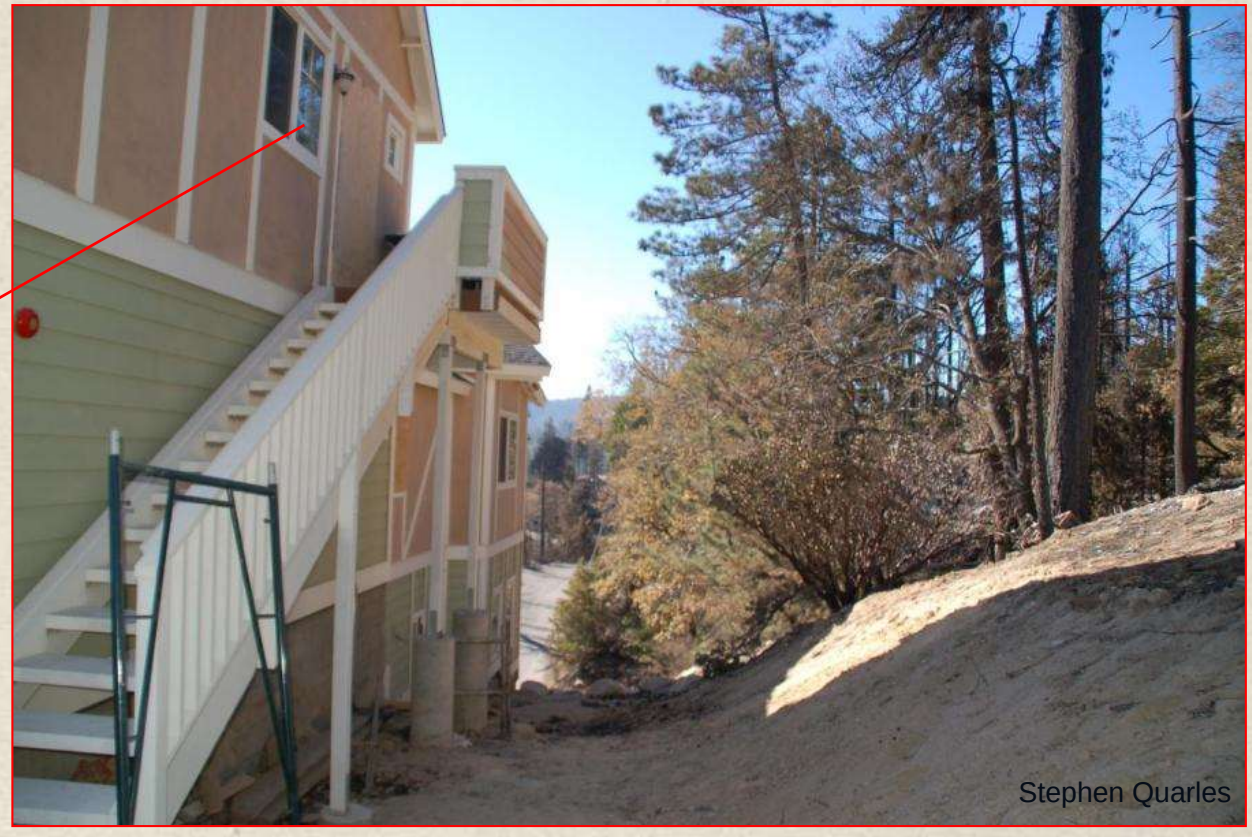
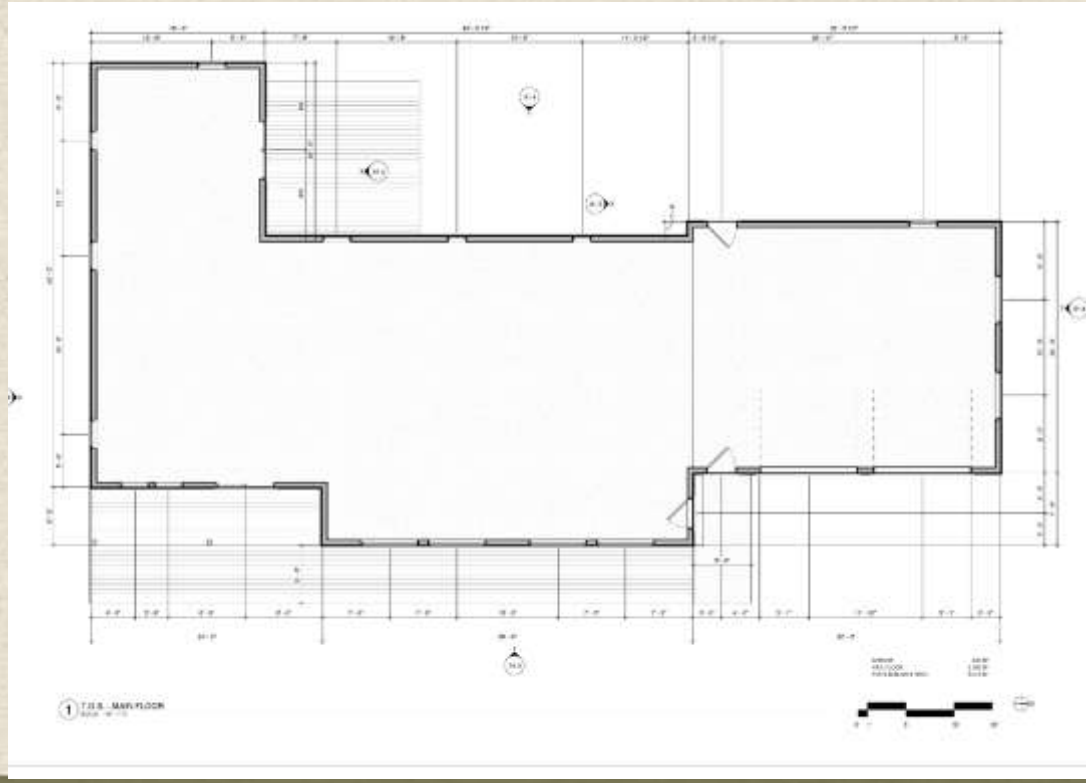
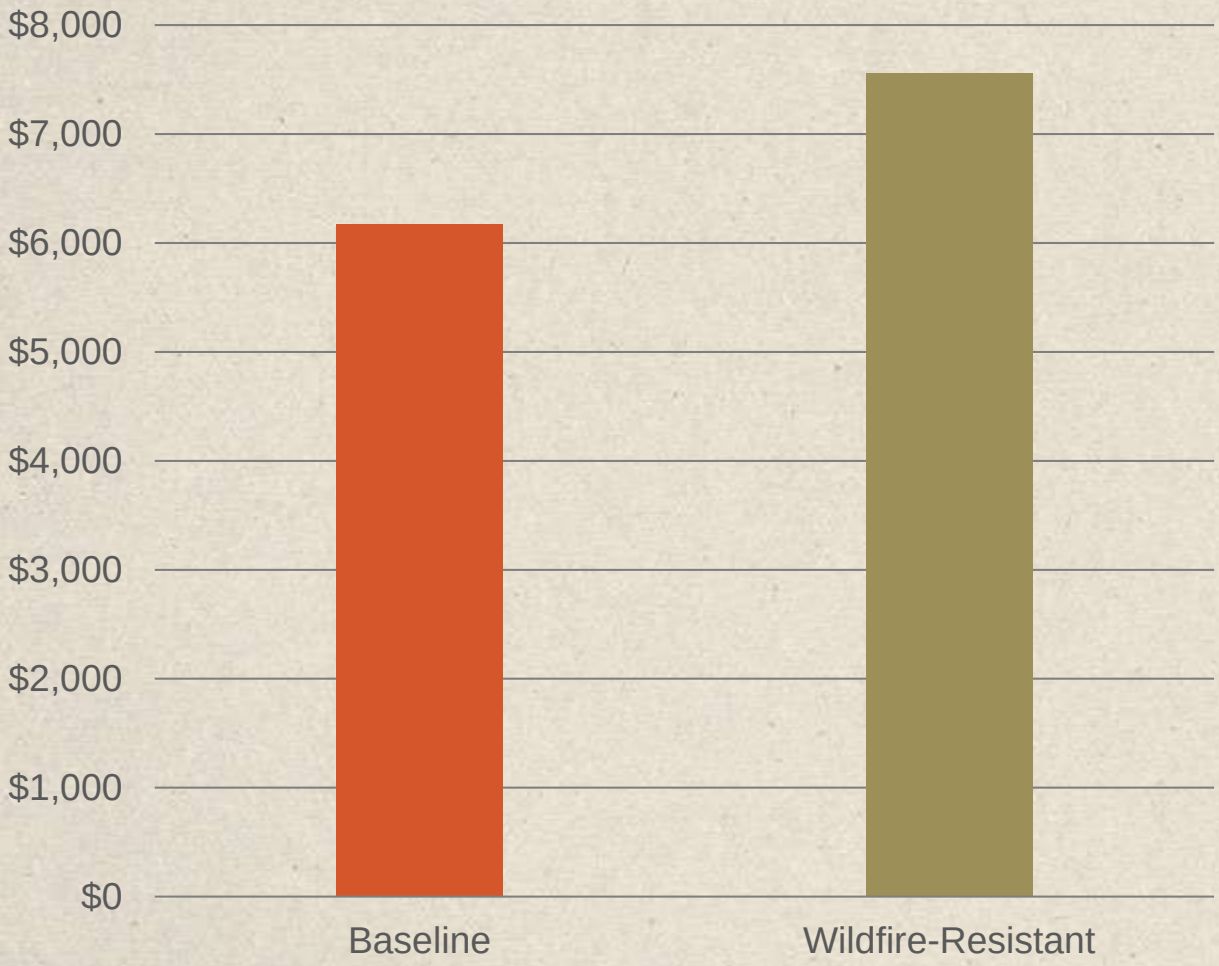
Windows

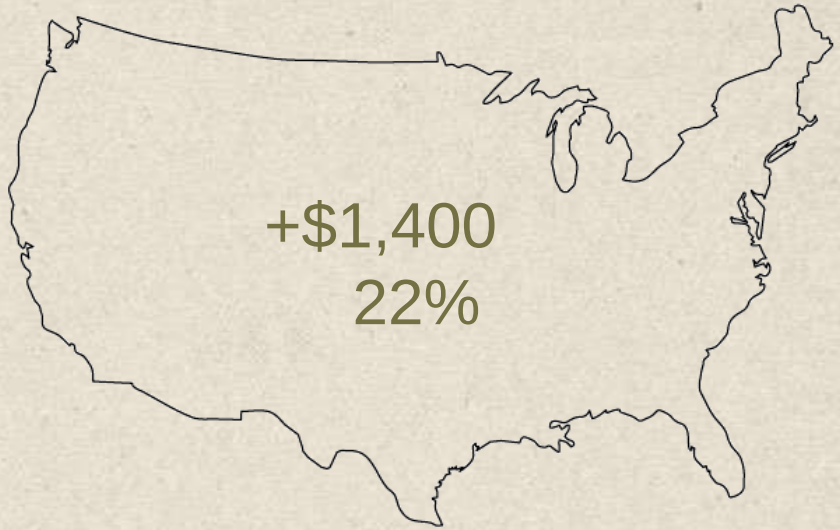


Doors



Doors


$8,000
$7,000
$6,000
$5,000
$4,000
$3,000
$2,000
$1,000
$0
Baseline
Wildfire-Resistant


+$1,400
22%


+24%


+26%

Doors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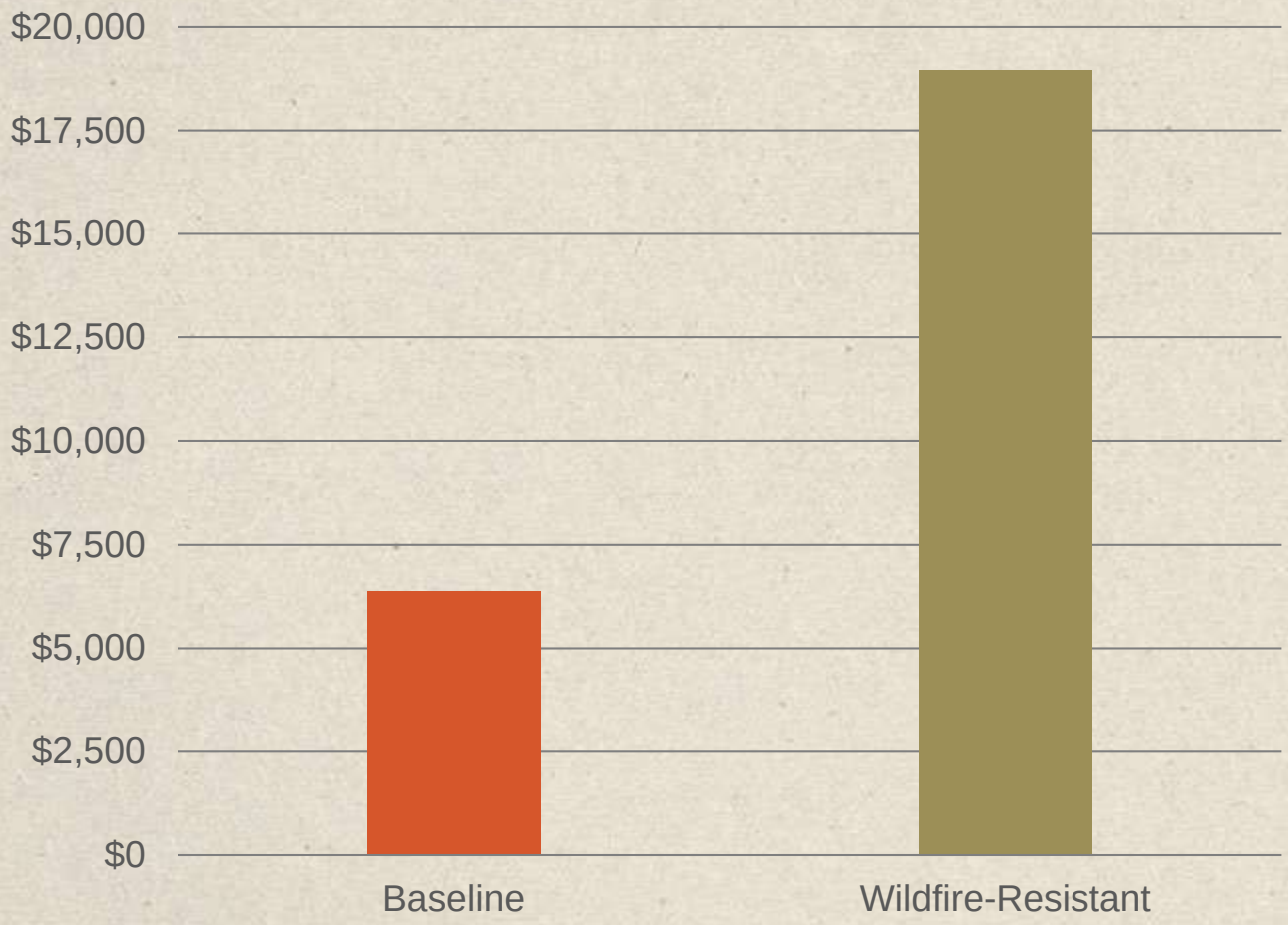
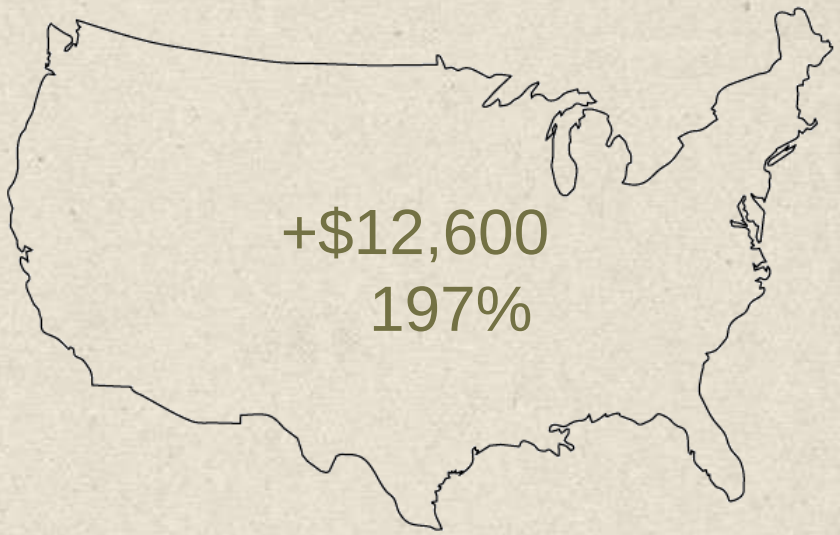
Deck


3 WEST ELEVATION
2 WEST ELEVATION
1 SOUTH ELEVATION


1 T.O.S. - MAIN FLOOR

Deck

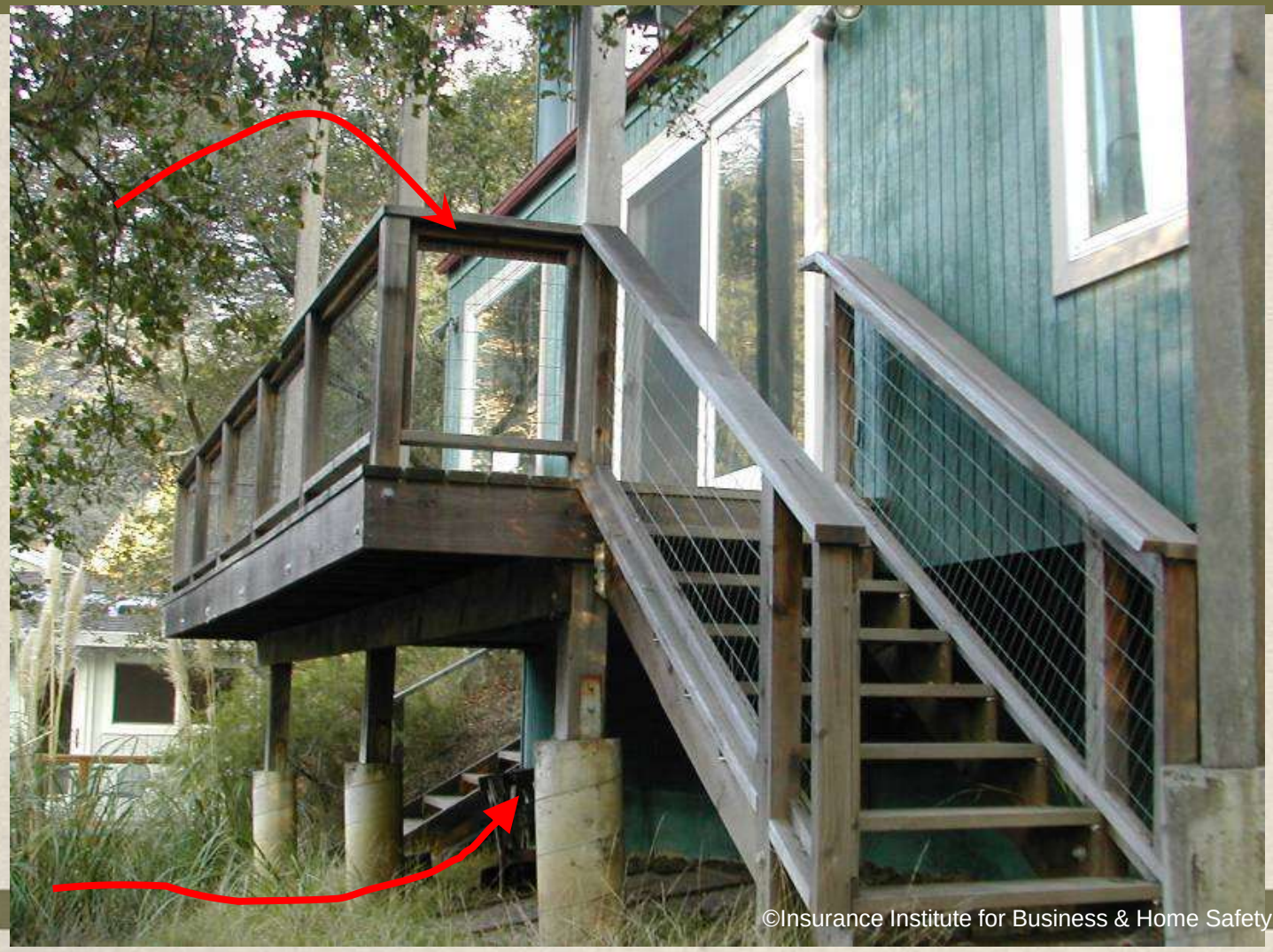

$20,000
$17,500
$15,000
$12,500
$10,000
$7,500
$5,000
$2,500
$0
Baseline
Wildfire-Resistant


+$12,600
197%


+213%

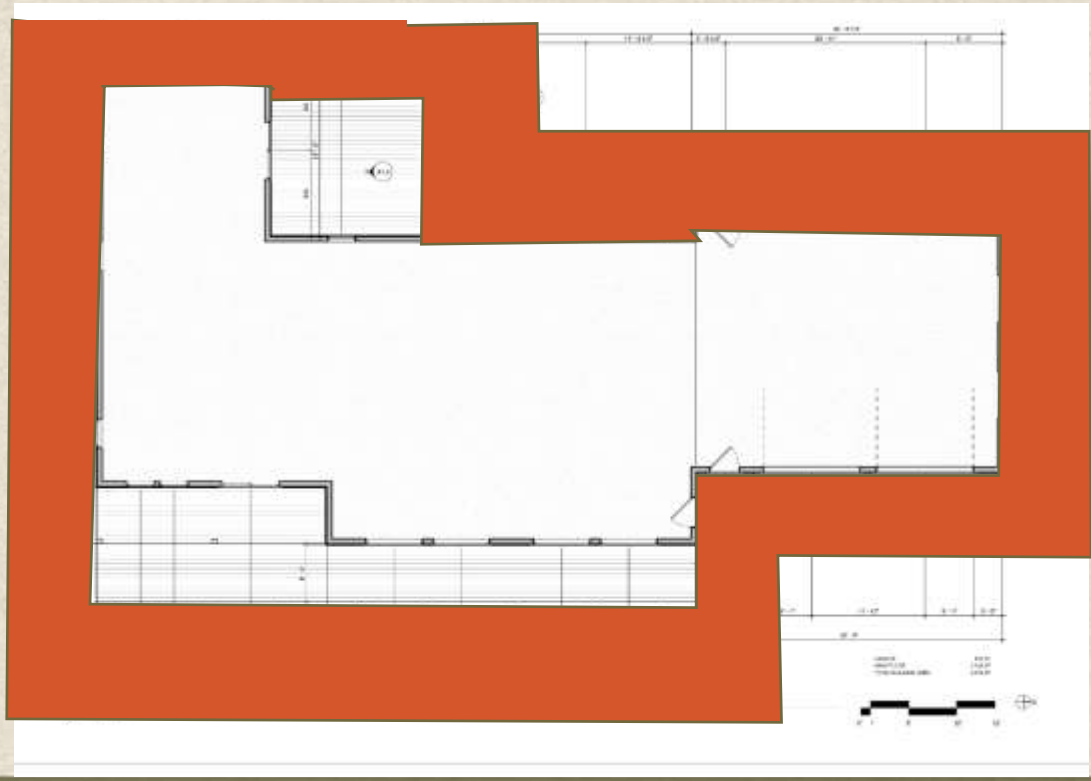

+214%

Deck Vulnerabilities

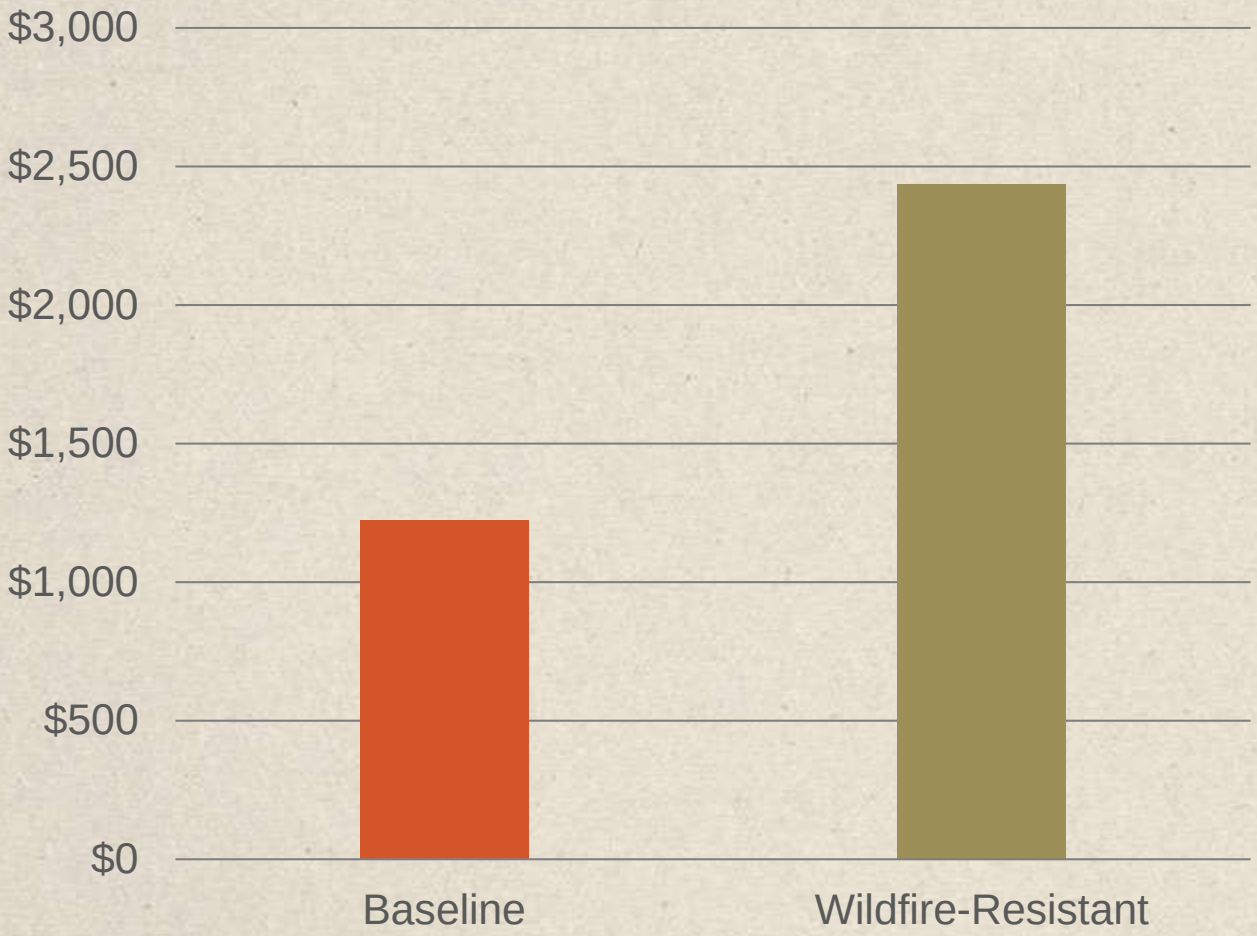


Performance with Tape

Home Ignition Zone



Home Ignition Zone



Defensible Space: 0-5 ft

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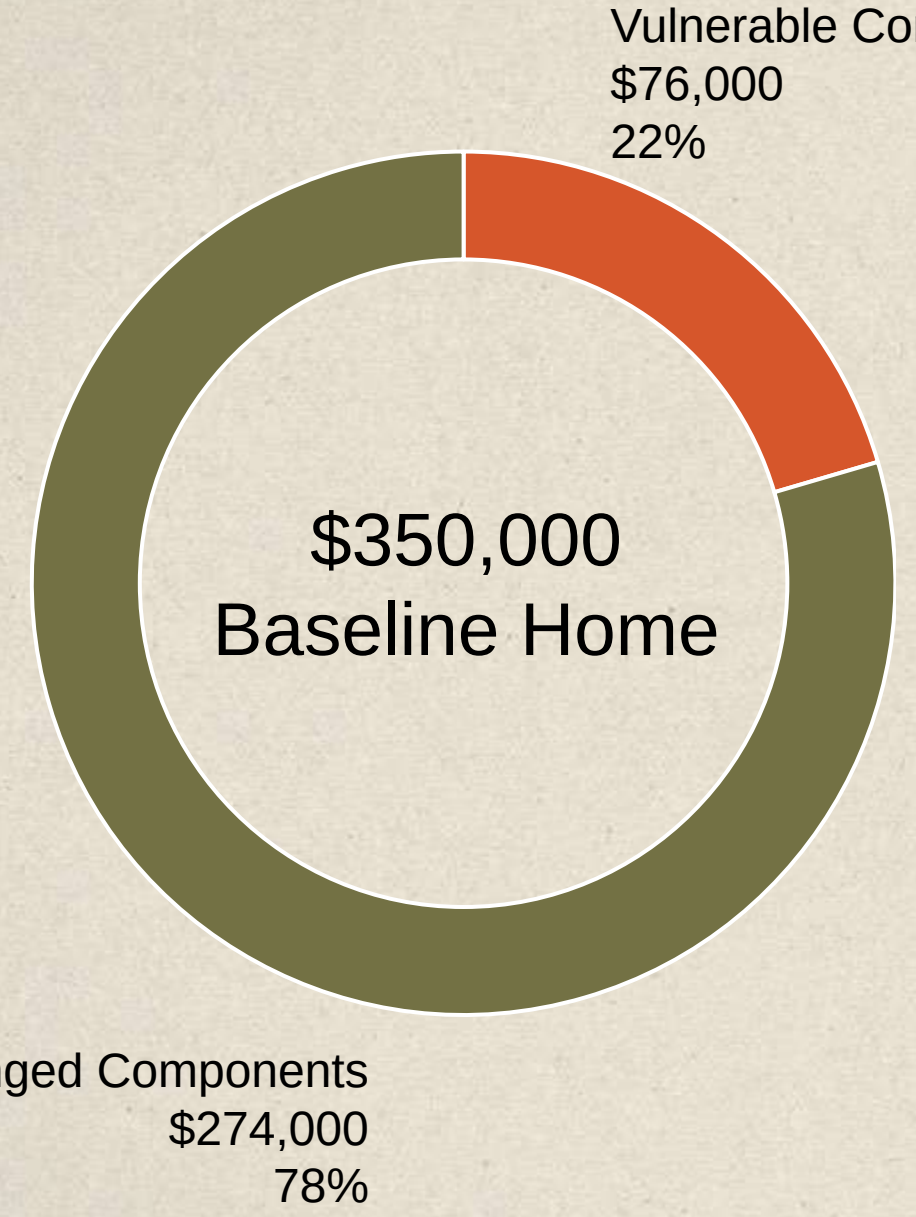
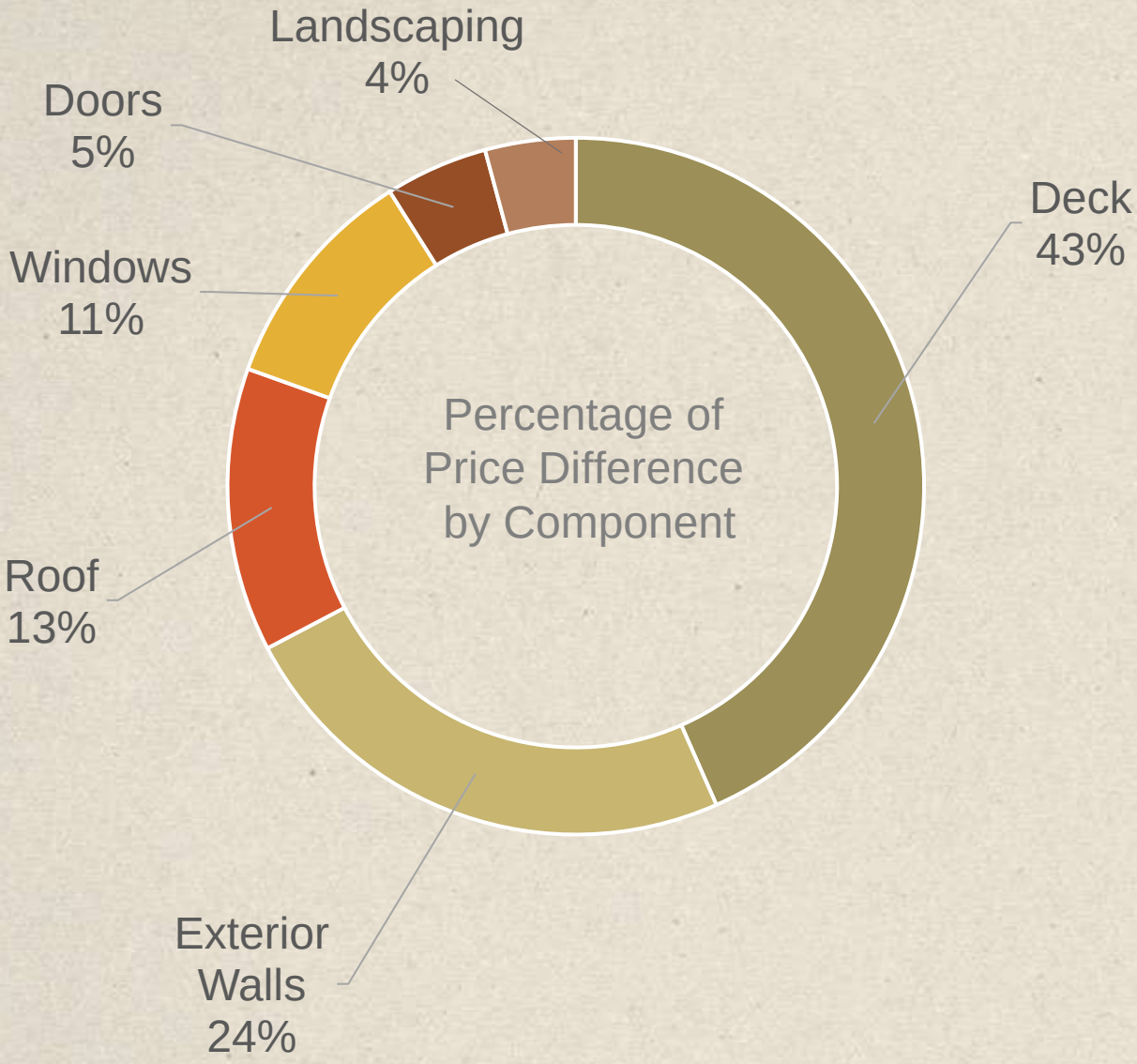
- Preliminary Results
- **Putting it All Together**

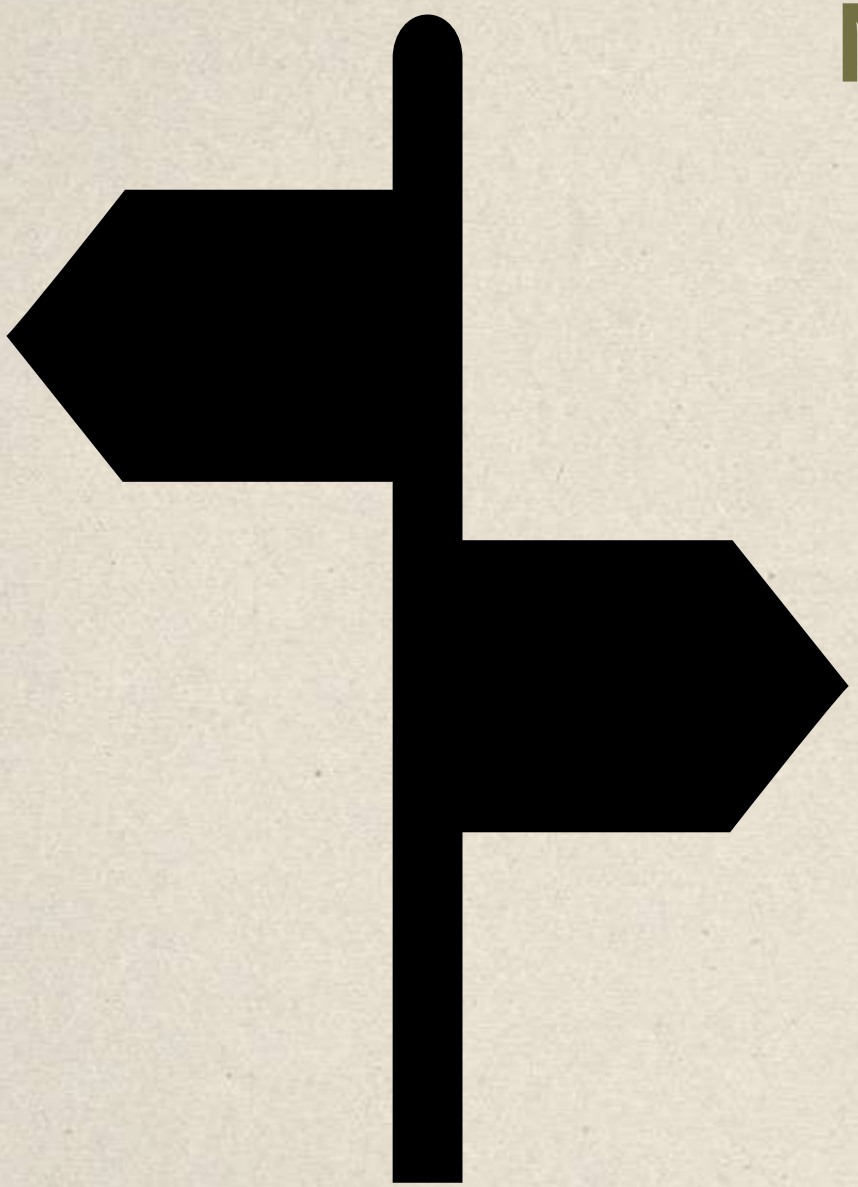


Six of the most vulnerable components make up 20-30% of a home’s cost.

Making those components wildfire-resistant adds 8-15% to the total cost of the home.



Deck and exterior walls make up the majority of increased expense to building a wildfire-resistant home.



Next Steps For This Study

- More regional specificity
- Additional options
- Retrofit scenario
- Spring 2018: Final Report

Thank You

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kelly@headwaterseconomics.org

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