

# **PROJECT: OVERCOAT**

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# Discussion Plan

1. Purpose of Project Overcoat
2. Current Story and a Half Methods
3. Project Overcoat Case Studies
4. Findings

# Purpose

1. Solution to Ice dams and related problems associated with Story and half Homes
2. Test the Exterior Thermal Moisture Management System (ETMMS) as a roof only approach roof-only approach for maximizing opportunities for insulation, air sealing, and roof deck ventilation
3. Compare the ETTMS Approach to current methods

**What is a Story and a Half (SAAH)?**











340



1525

1525

# Why Story and a Half

- 1.Represents common building type
- 2.Typically has performance issues
- 3.Difficult to retrofit

# What are the problems with the Story and a Half?

1. Durability
2. Ice Dams
3. Comfort
4. Air Quality
5. Moisture Issues
6. Utility Costs

**WHY ARE SAAH'S A PROBLEM?**

# **Why are SAAHs a Problem?**

Boundary Conditions!

# Why are SAAHs a Problem?

1. Attics are not intended to be finished
2. Desire to maximize space
3. Using the roof for a wall
4. Creating confused spaces
5. The devil is in the details

# Retrofit Performance Goals

1. Air Leakage reduction
2. Moisture Management
3. Increase R-Value
4. Minimize Thermal Bridging
5. Appropriate Ventilation (IAQ)
6. Combustion Safety



# **Current Methods: Interior Approach**

# CASE 1











Manville  
Glass  
INSULATION  
SPINSULATION  
Fiber Glass  
Johns-Manville

Manville  
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Fiber Glass  
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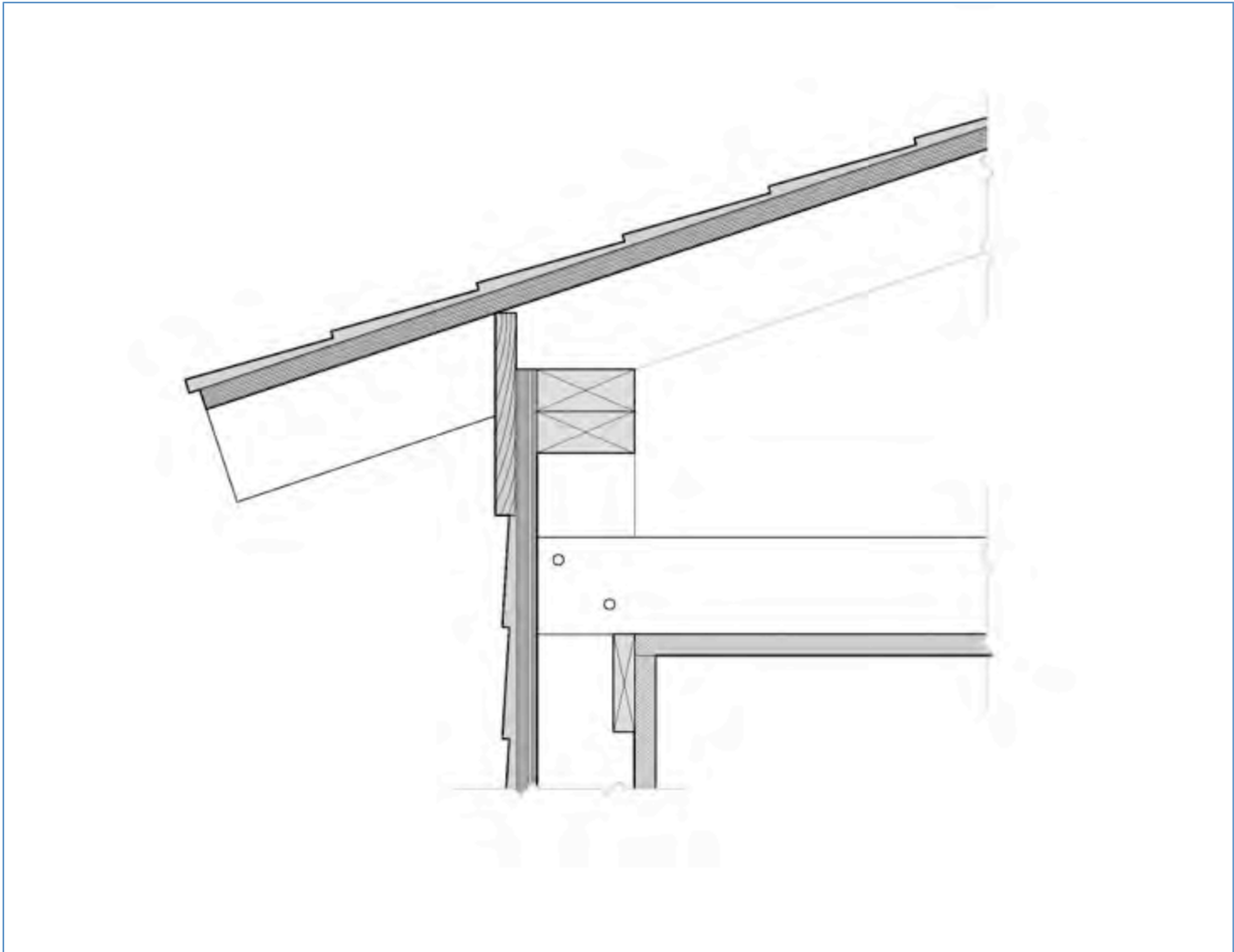
# Interior Approach

## EXISTING CONDITION



# Interior Approach

## EXISTING CONDITION



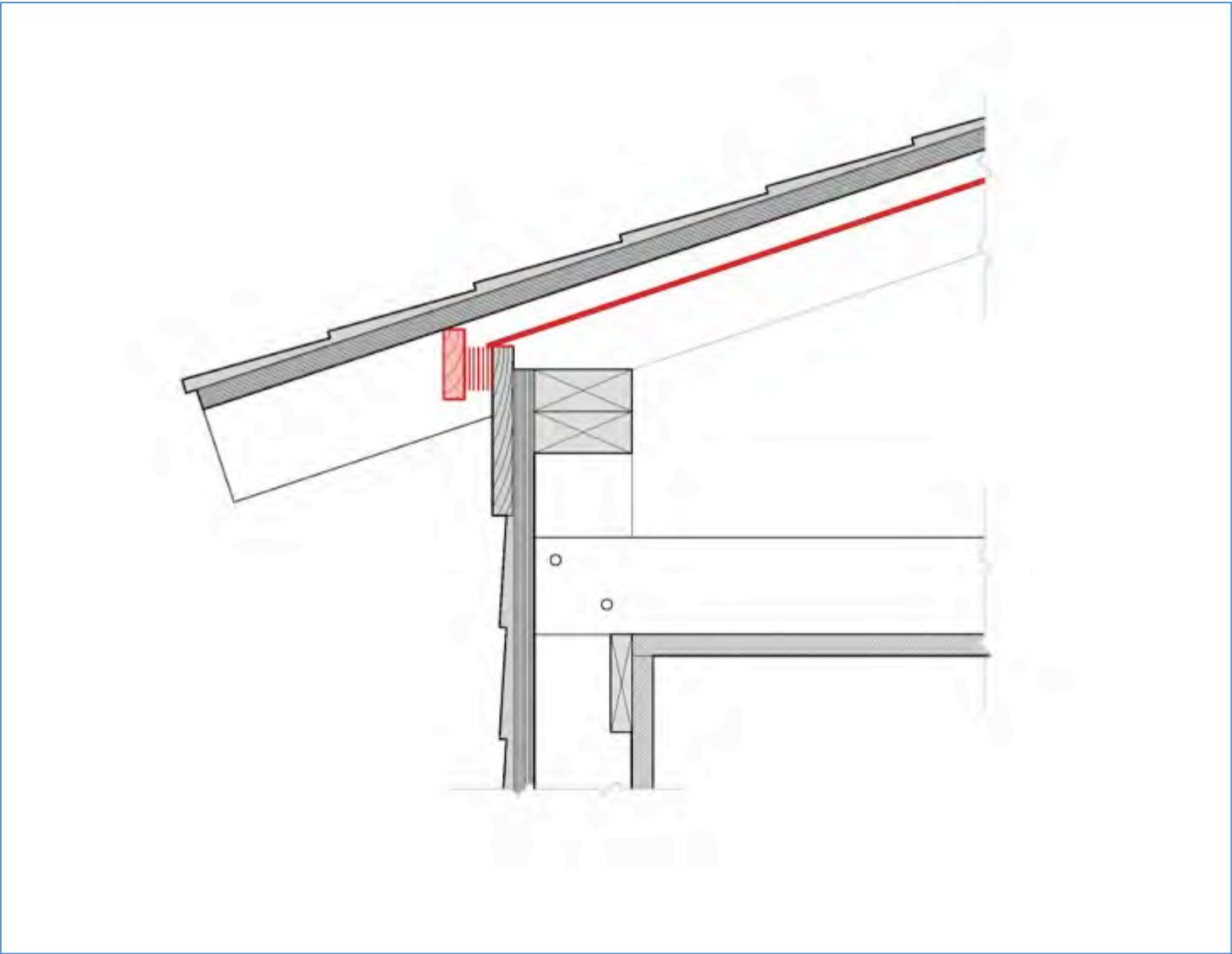


# Interior Approach

## ROOF VENTILATION



# Interior Approach ROOF VENTILATION



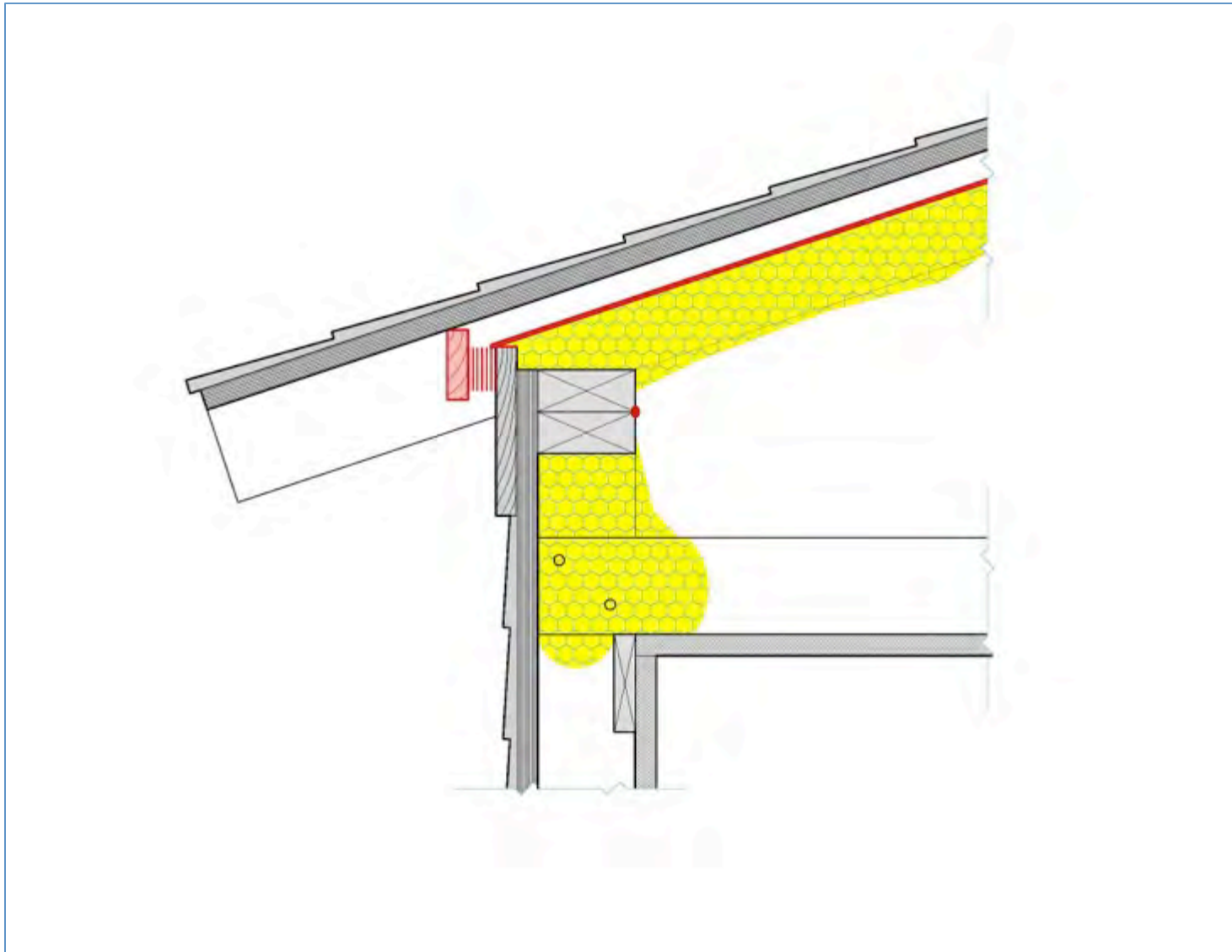
# Interior Approach

## ROOF VENTILATION



# Interior Approach

## CAVITY INSULATION



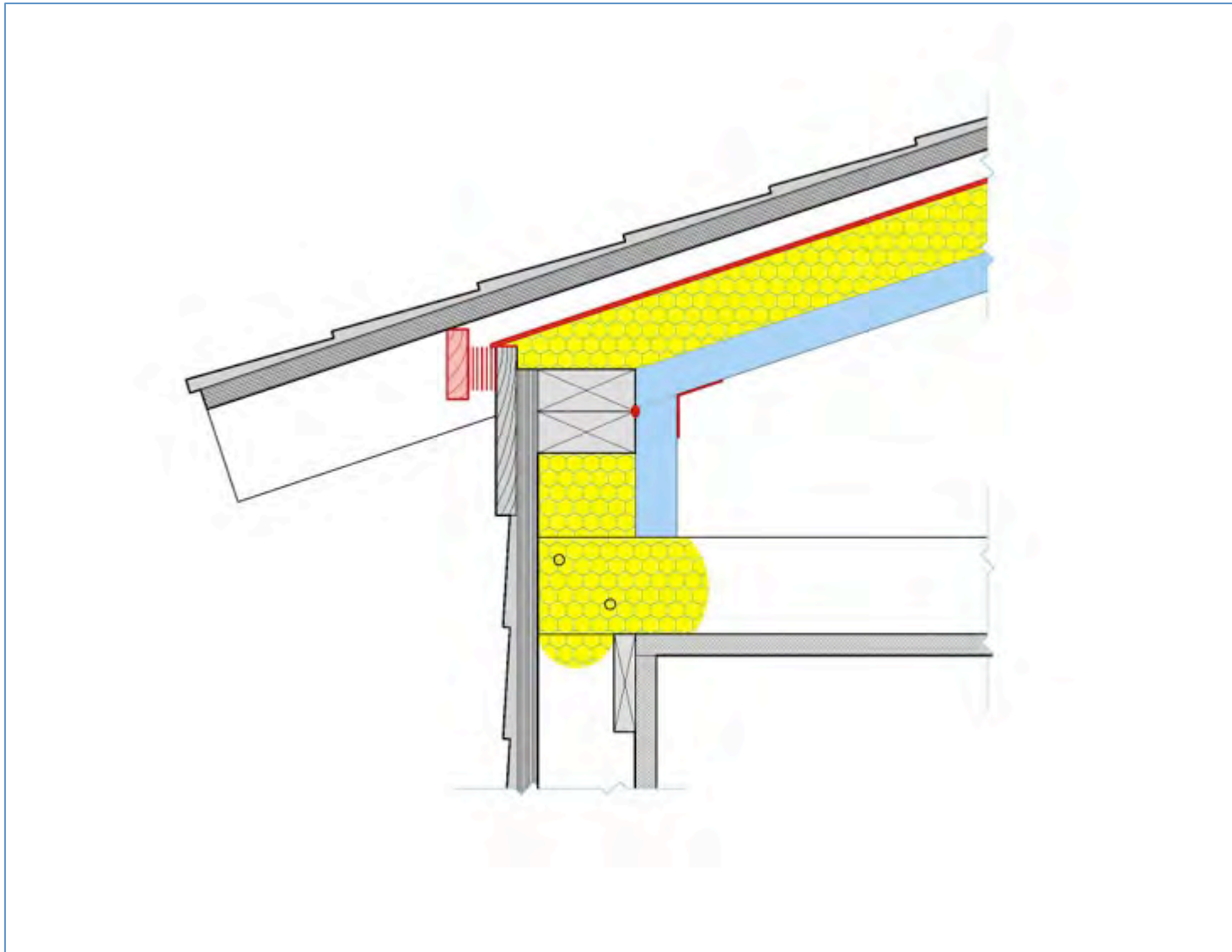
# Interior Approach

## CAVITY INSULATION



# Interior Approach

## FOAM SHEATHING



# Interior Approach FOAM SHEATHING



**Current Methods:  
Mixed Interior/Exterior Approach**



# CASE 2



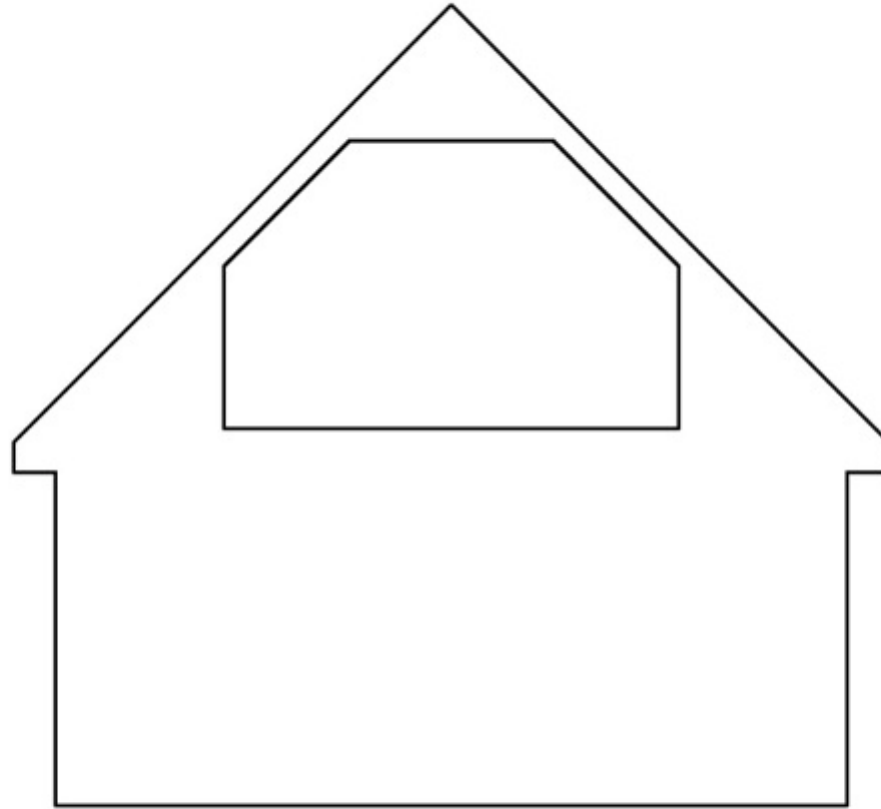




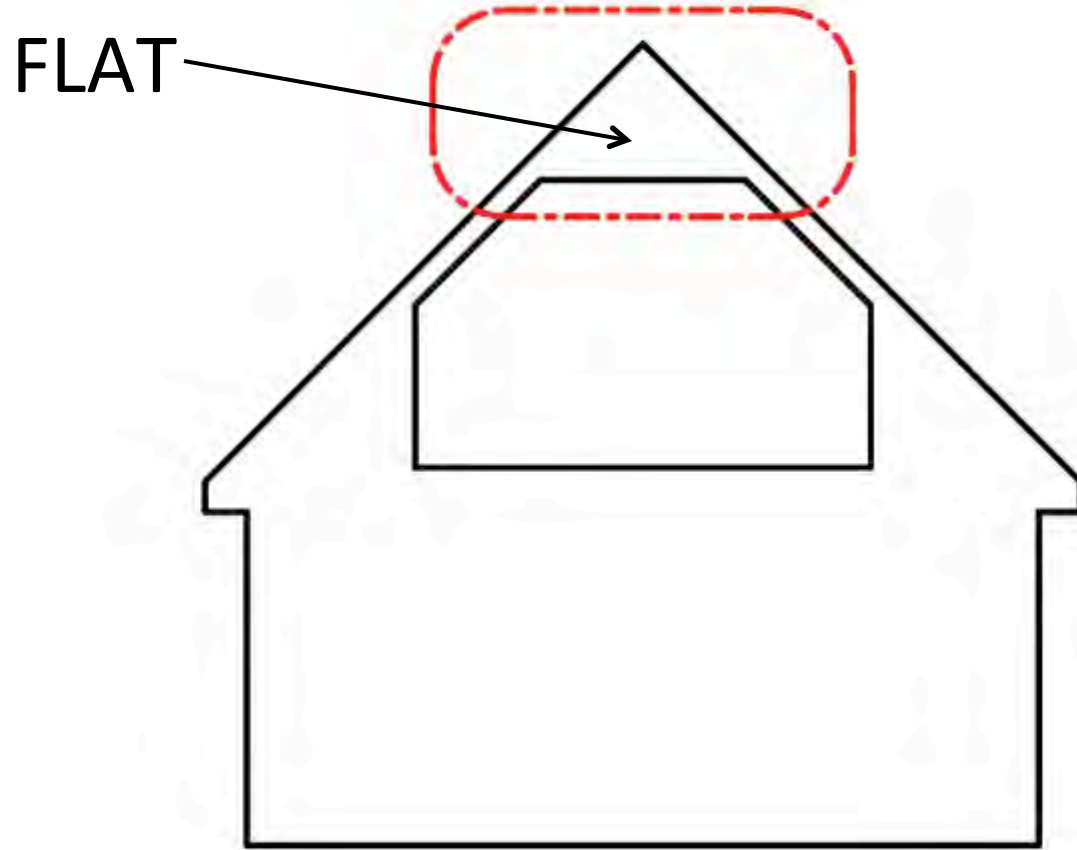




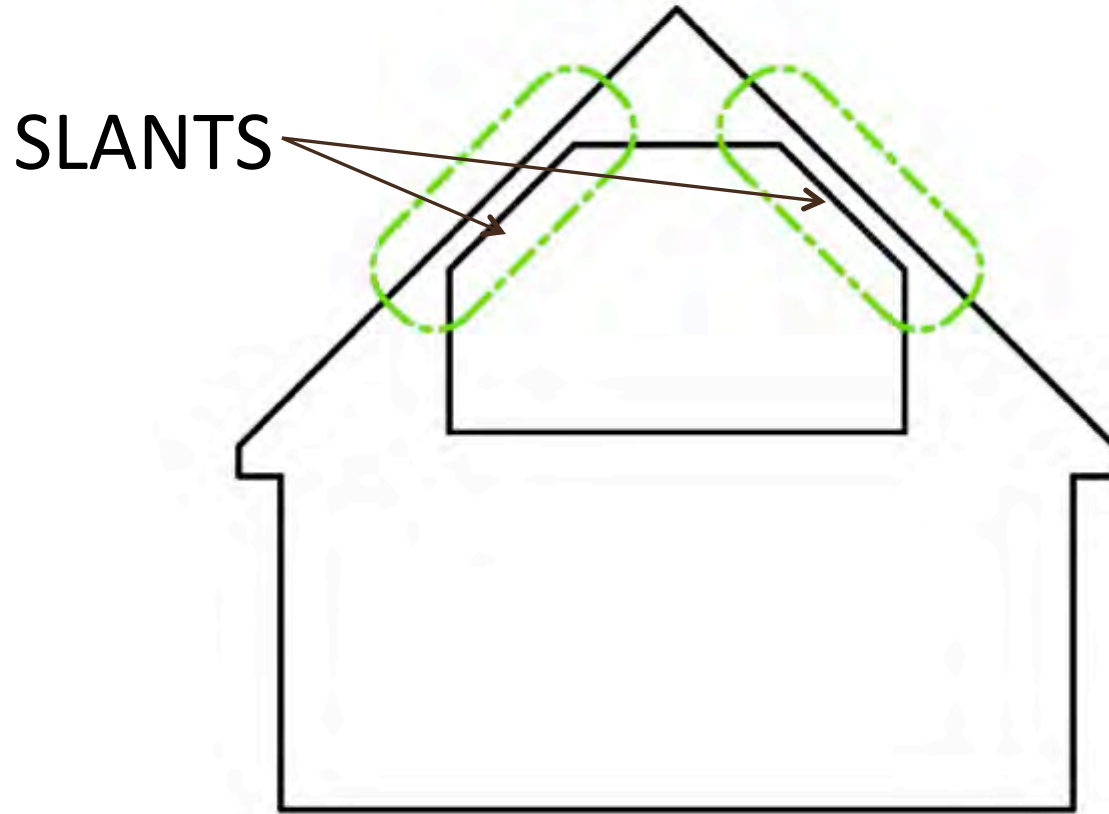
# Interior/Exterior Mixed Approach



# Interior/Exterior Mixed Approach



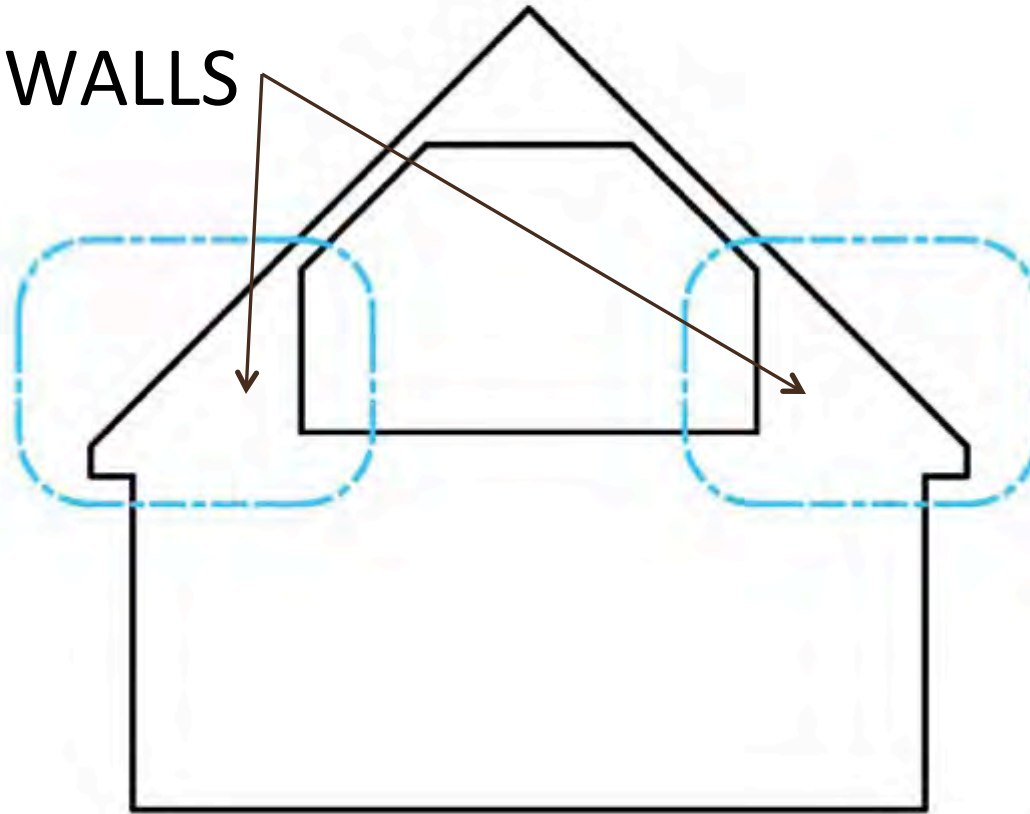
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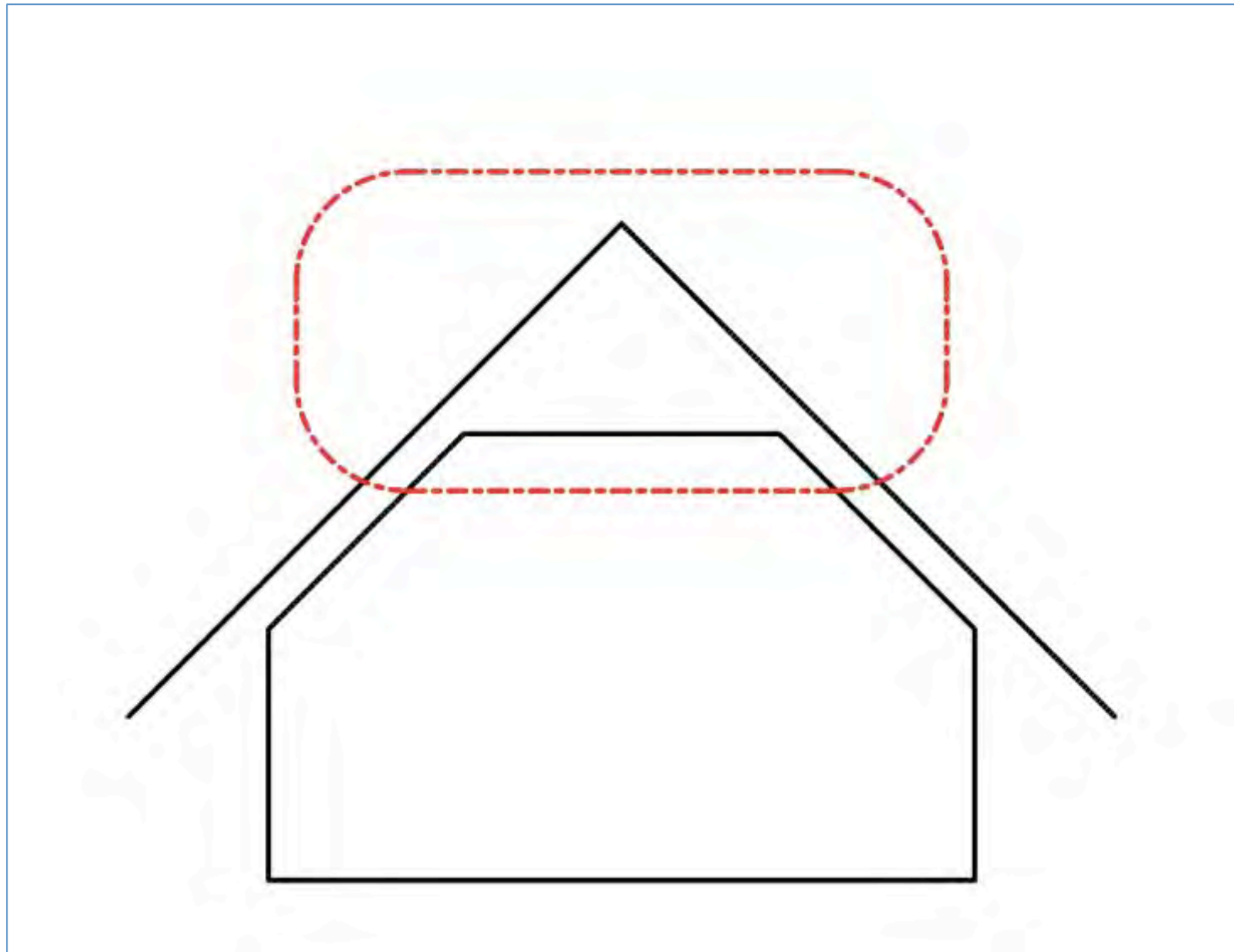


# Interior/Exterior Mixed Approach

KNEE WALLS



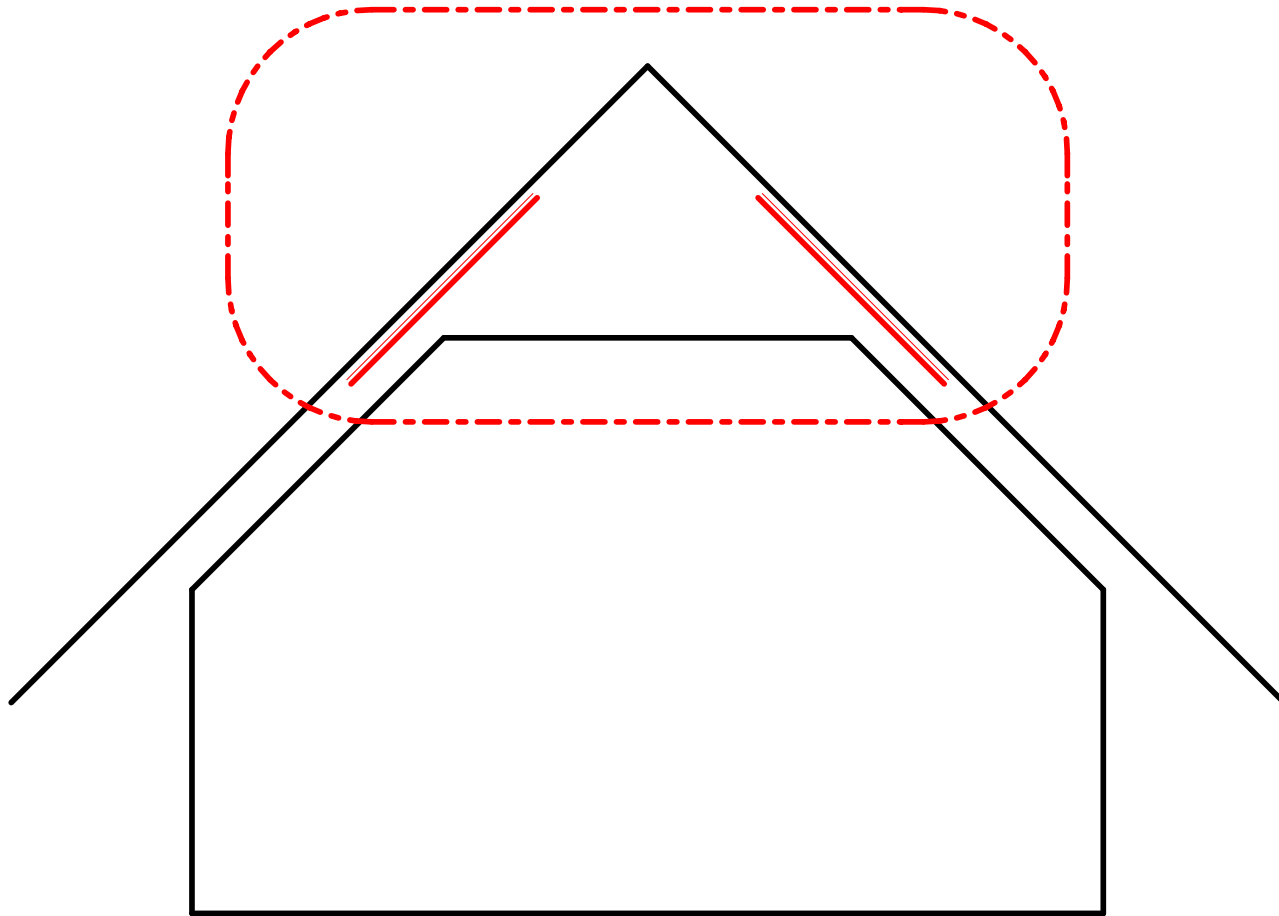
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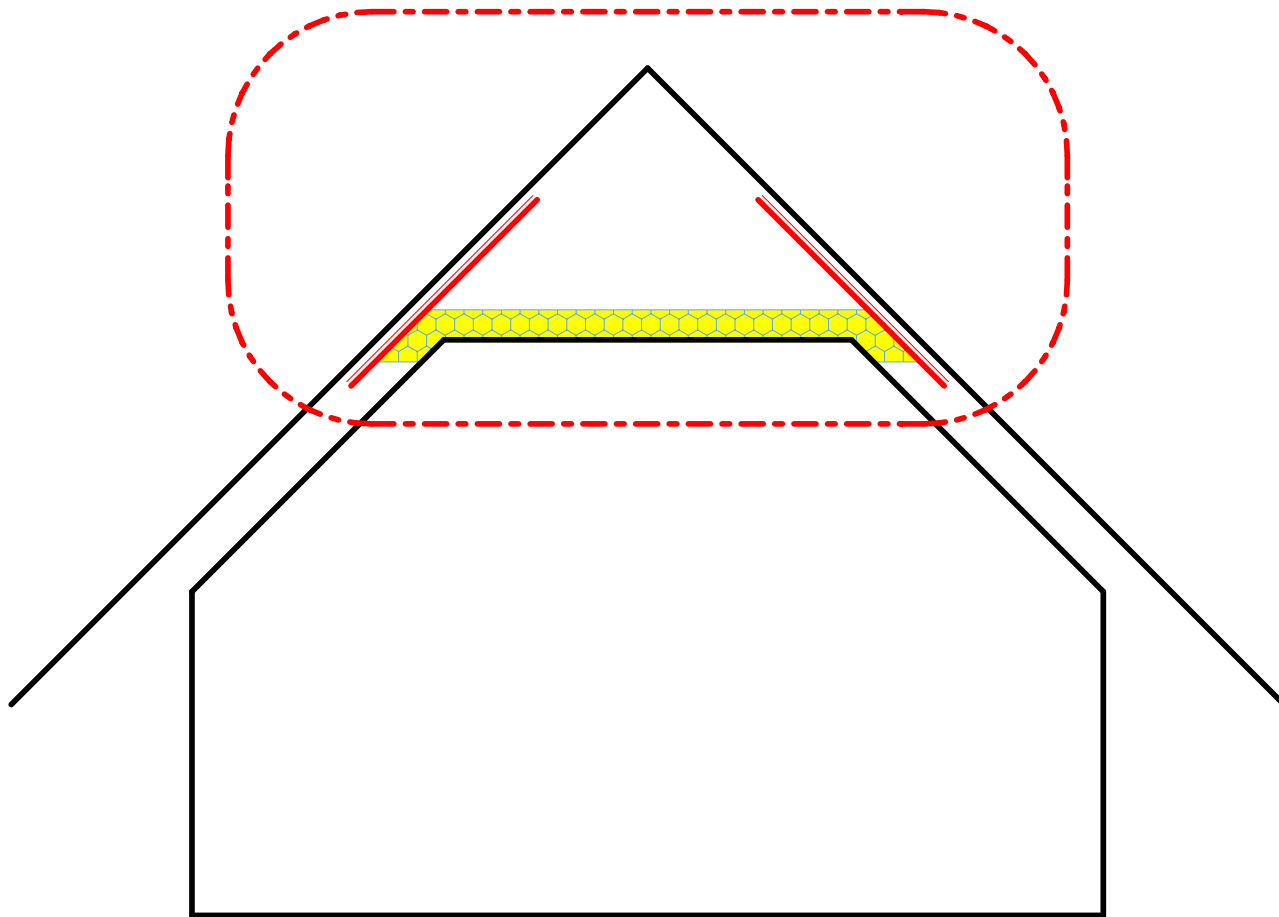
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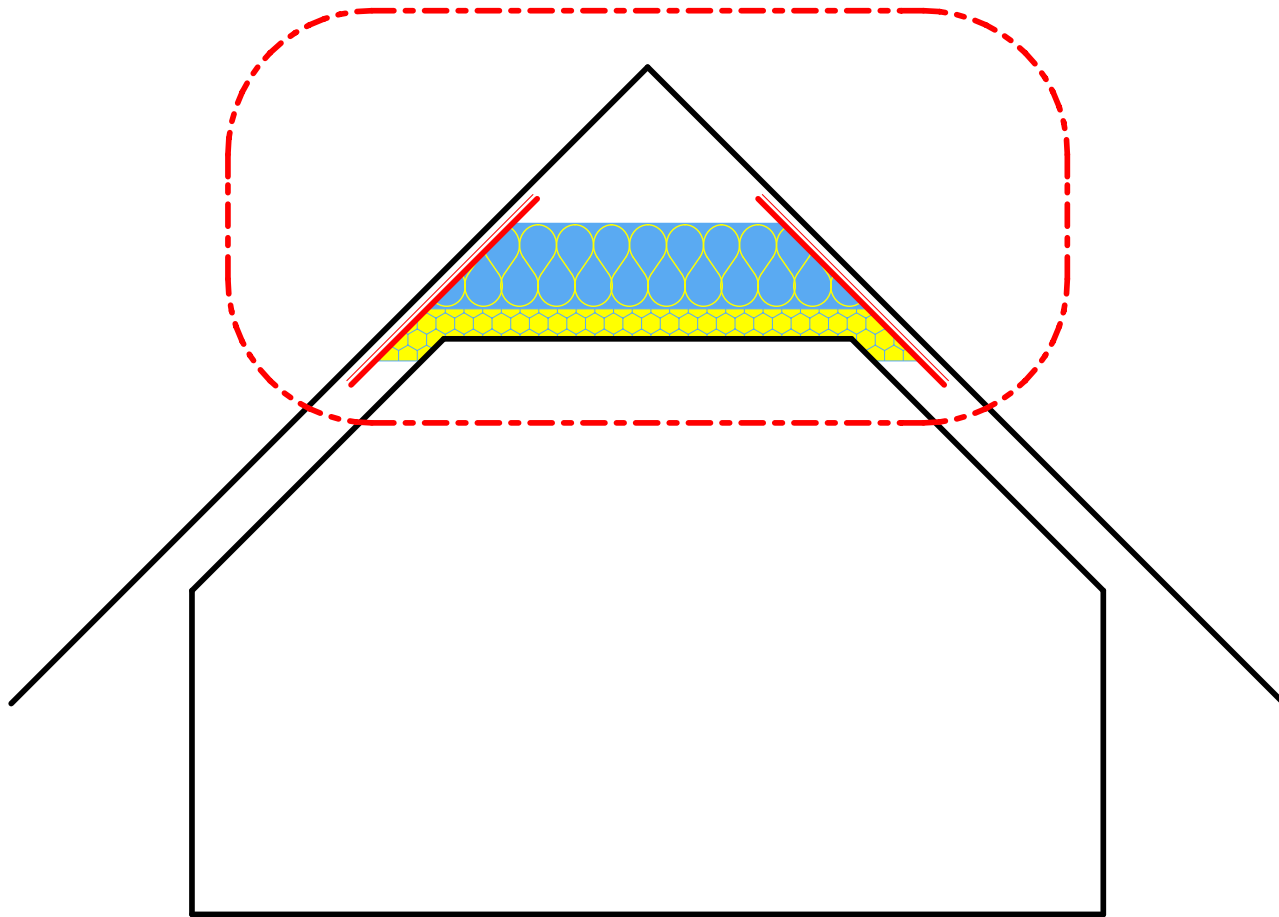
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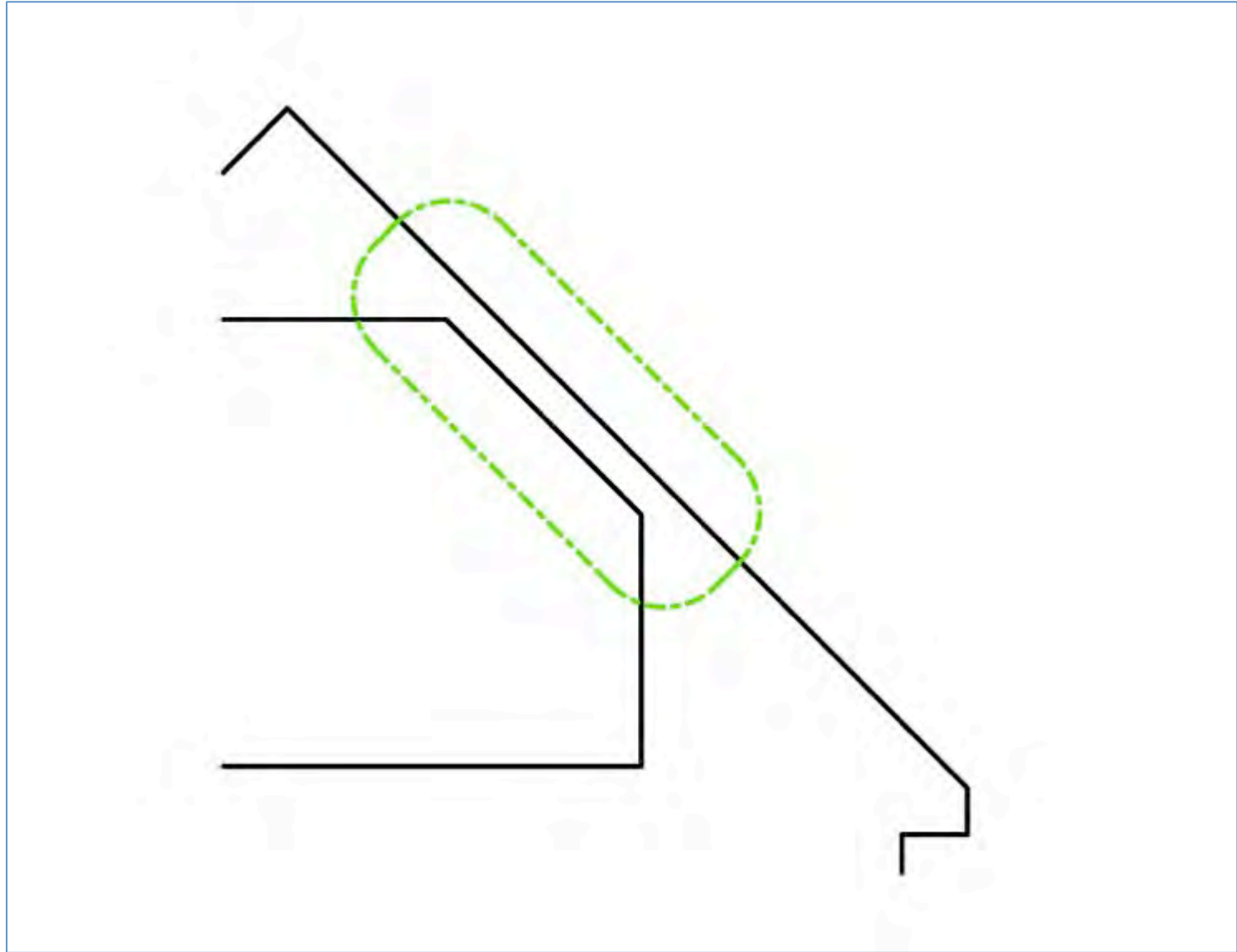




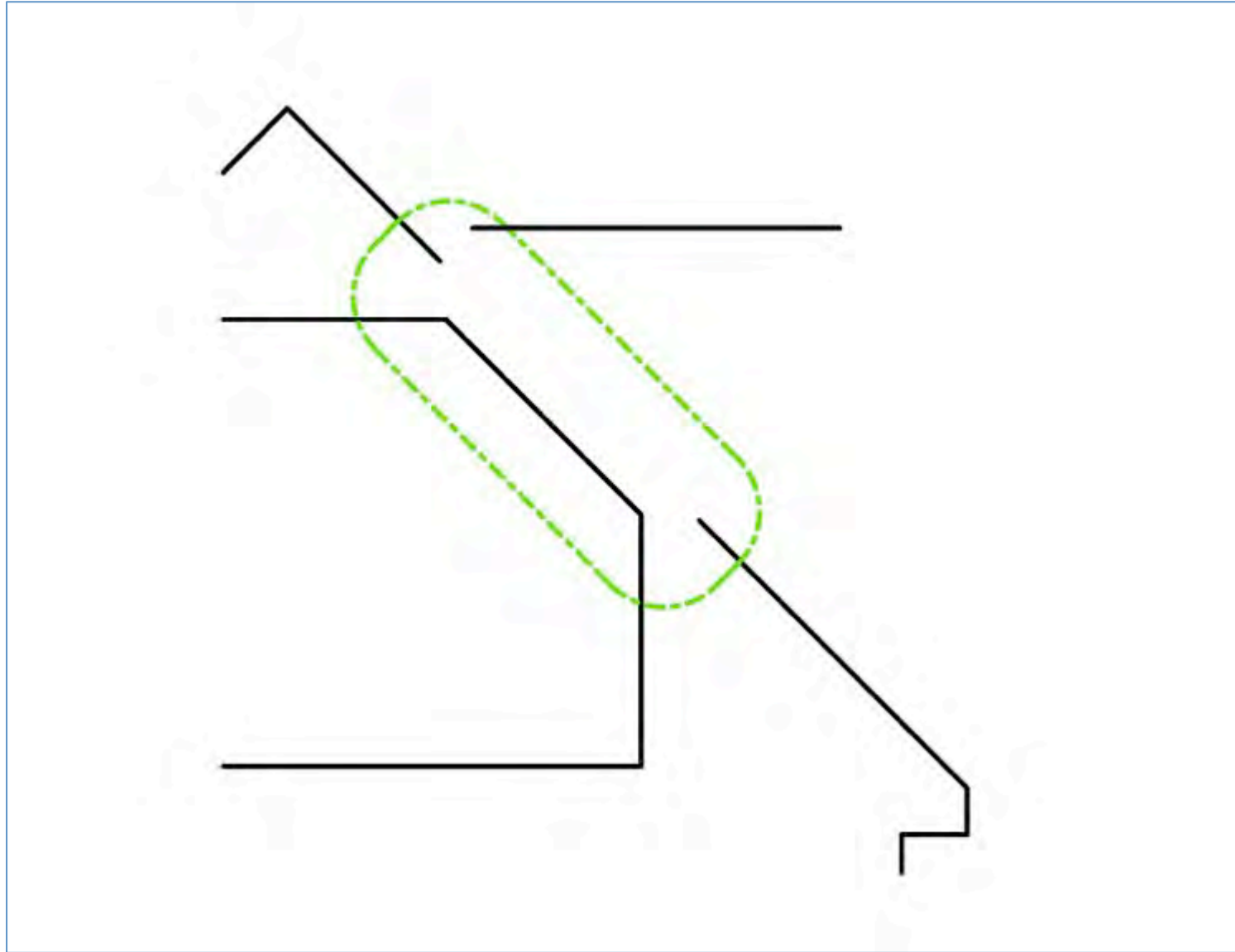
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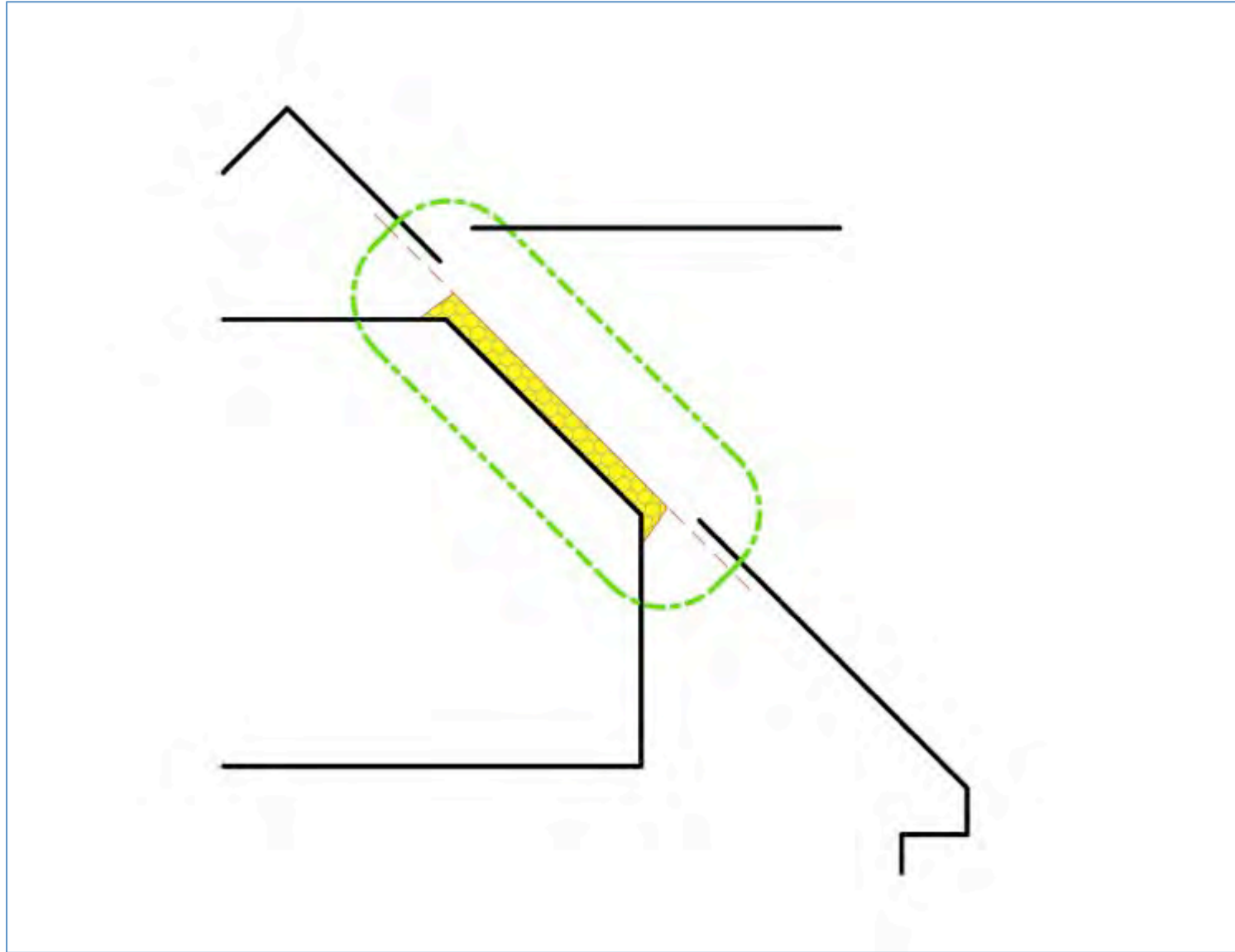
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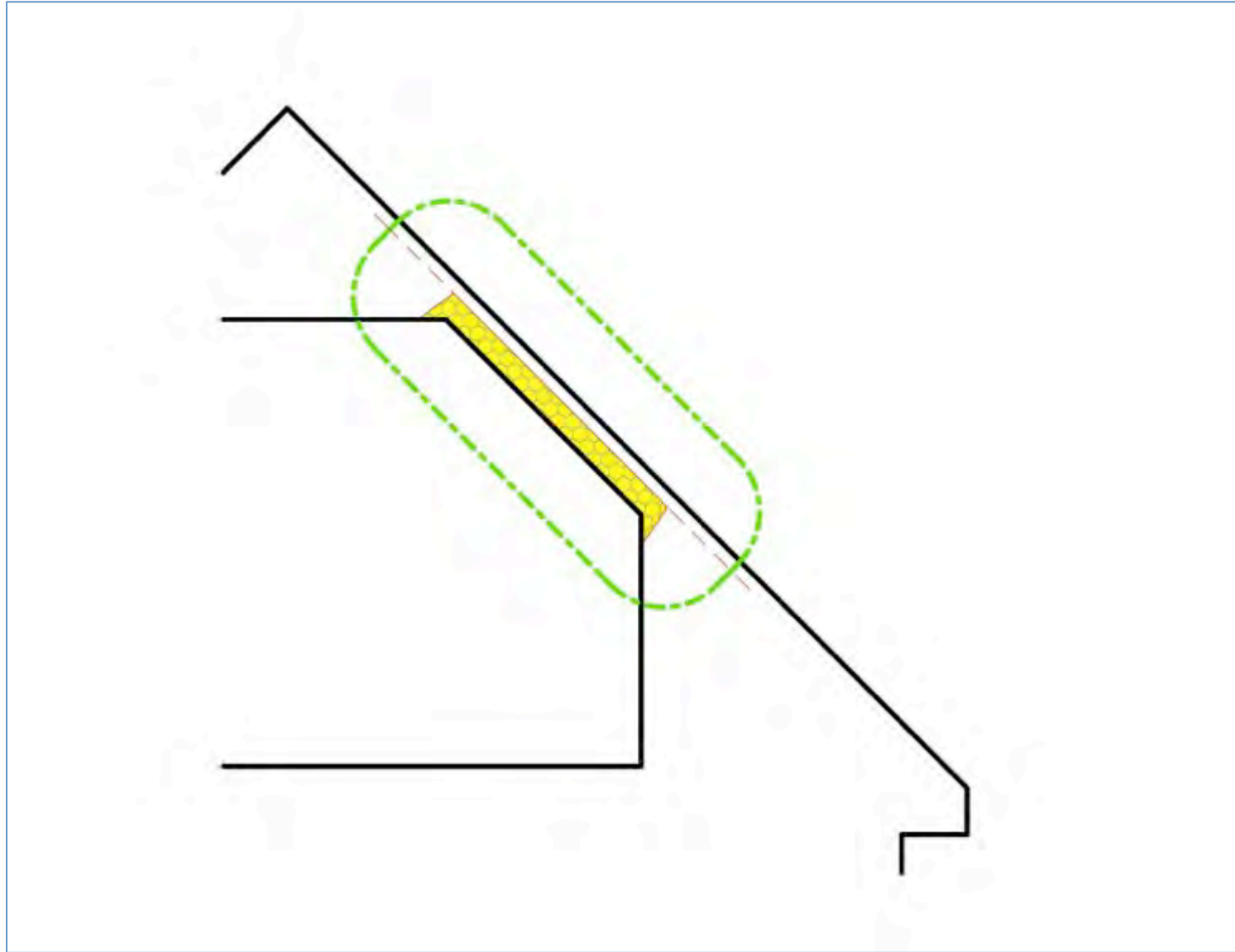
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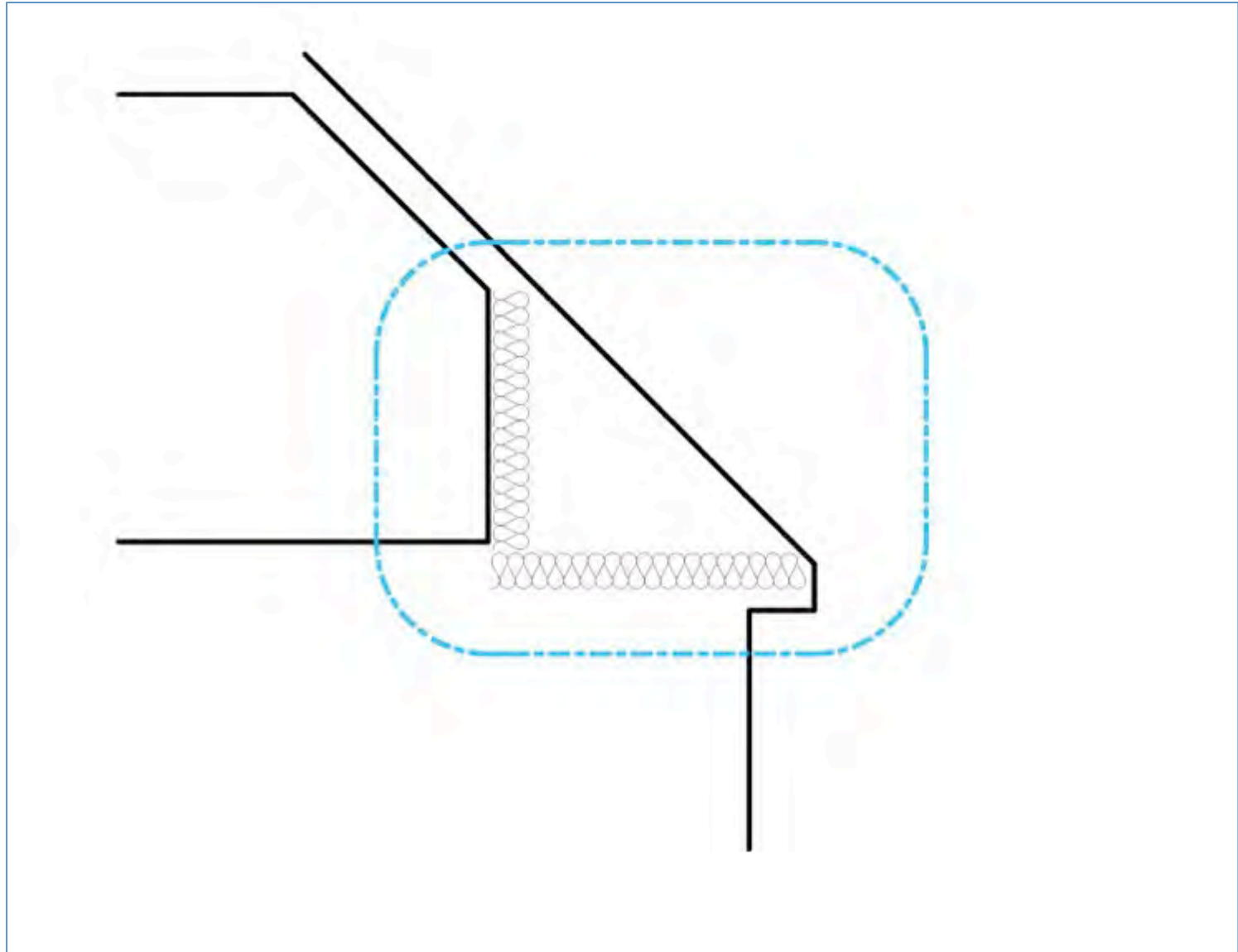


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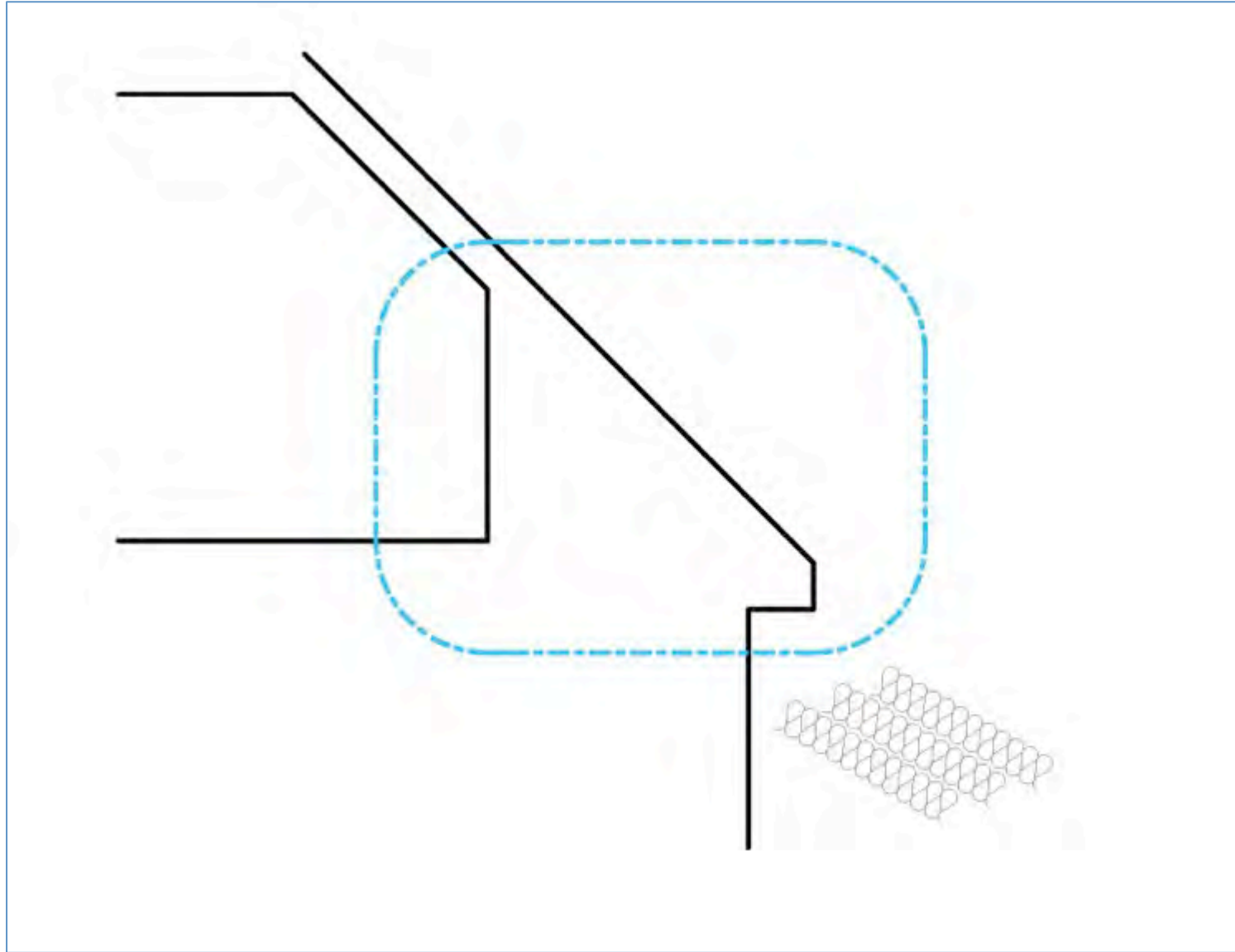
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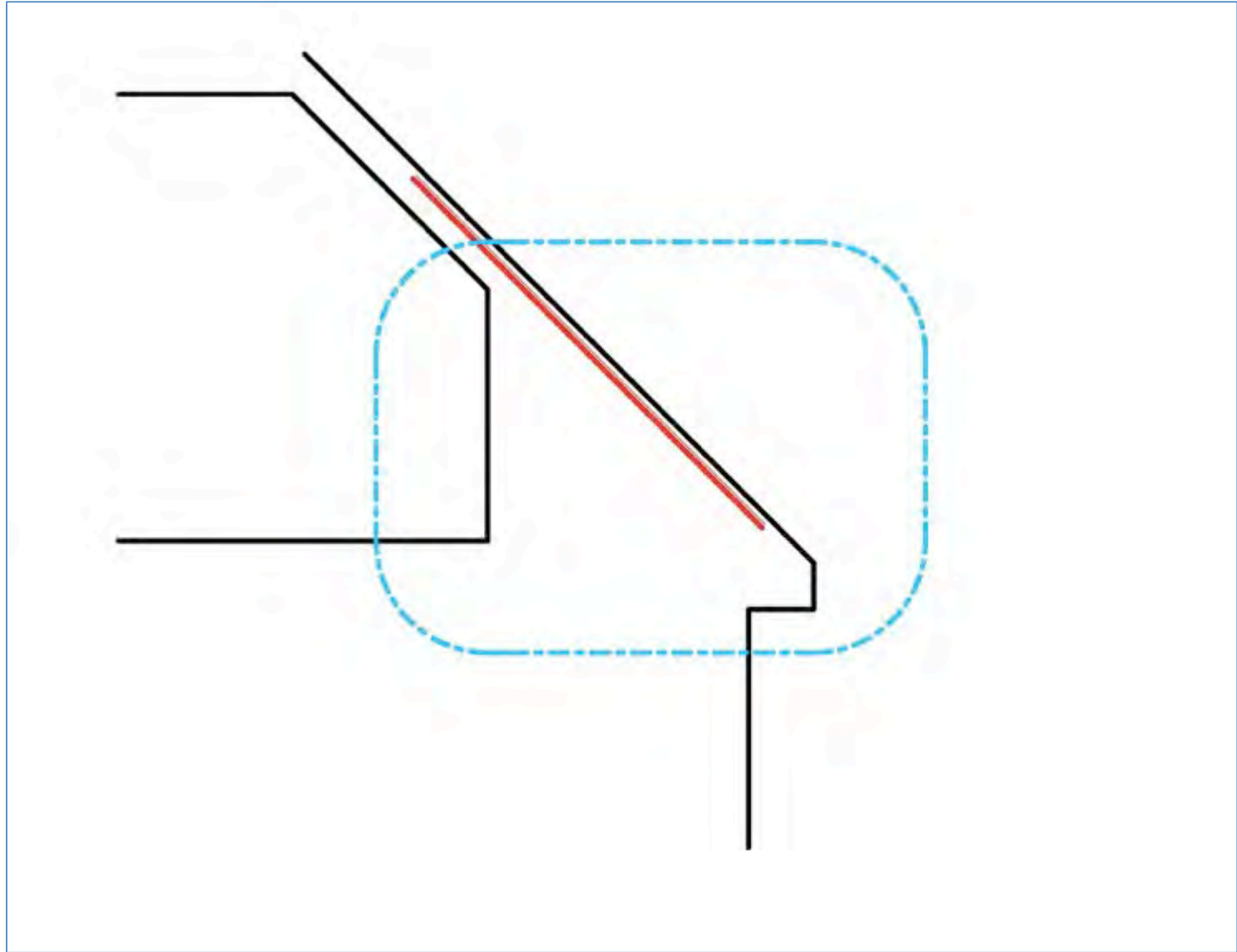
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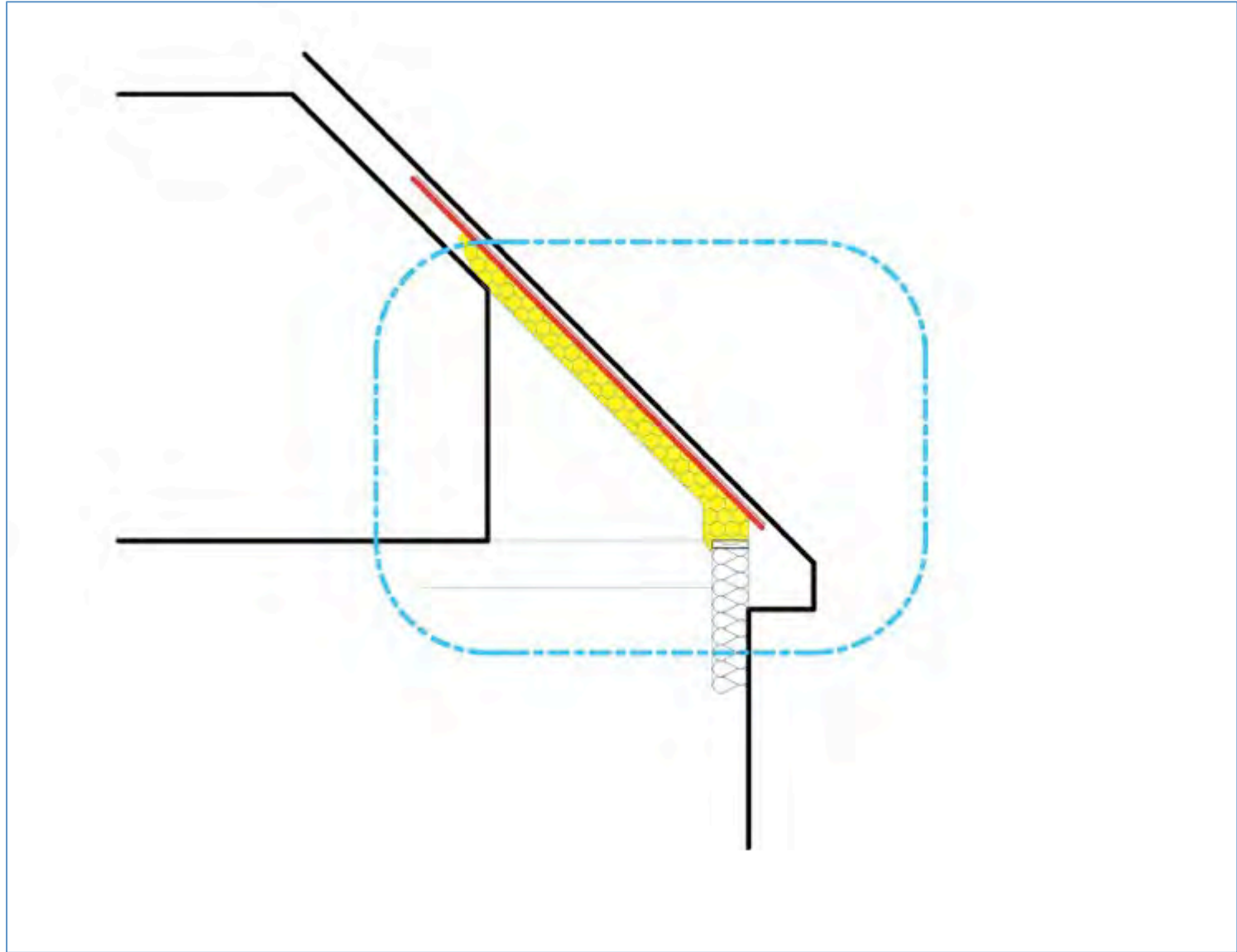
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# Interior/Exterior Mixed Approach



# Interior/Exterior Mixed Approach





# Interior/Exterior Mixed Approach



# Overcoat: Case 1

# CASE 1













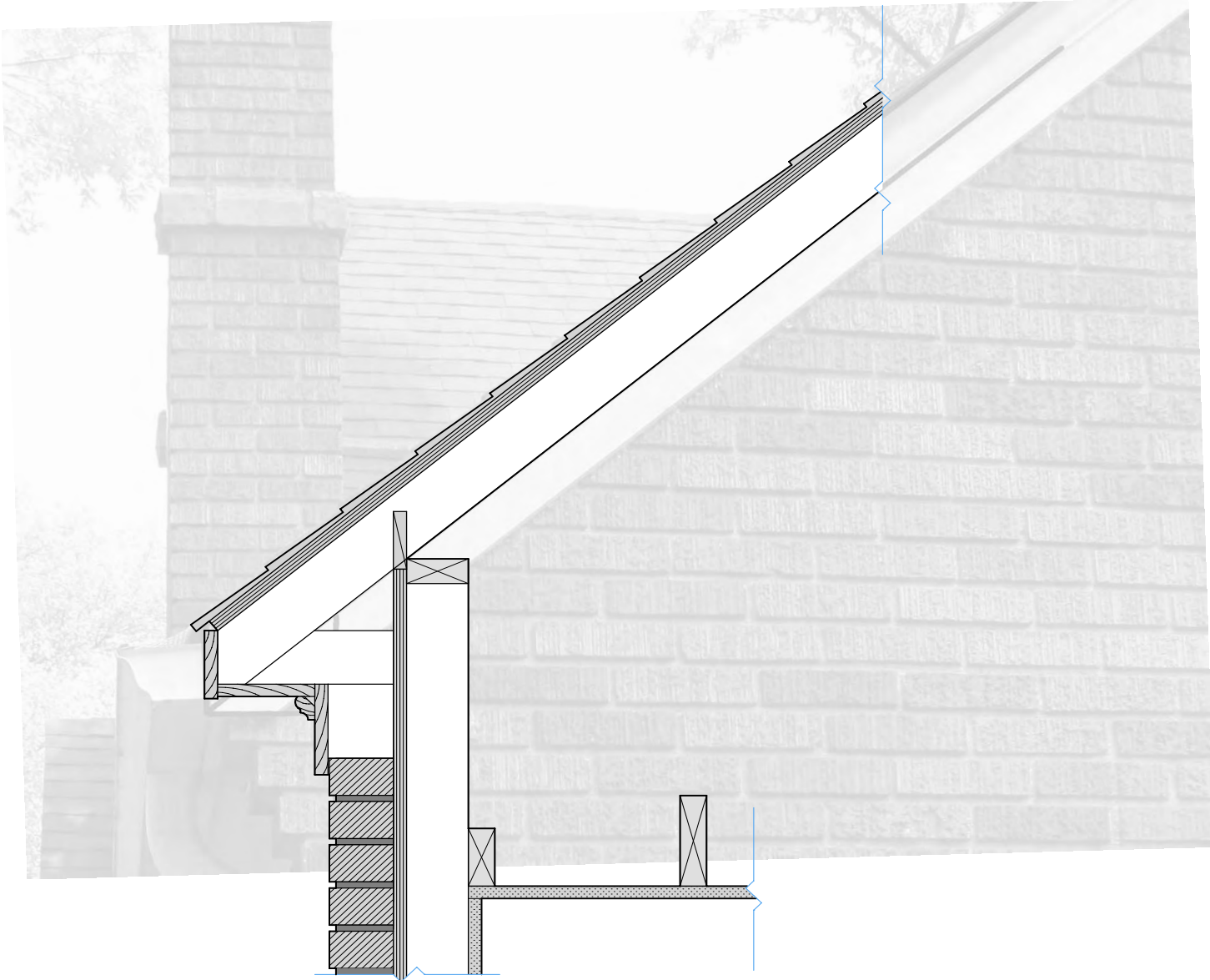




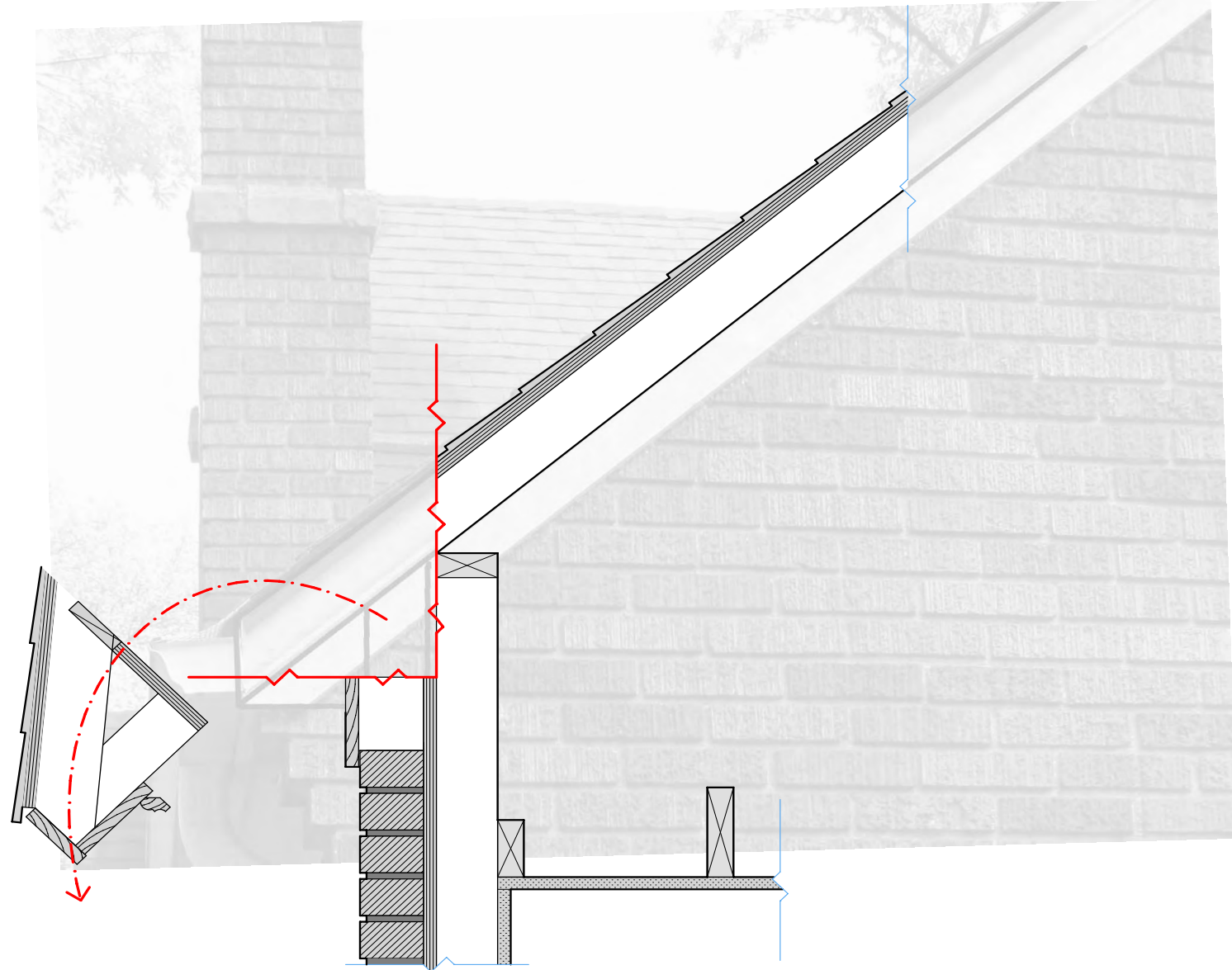
# What is an Overlay?



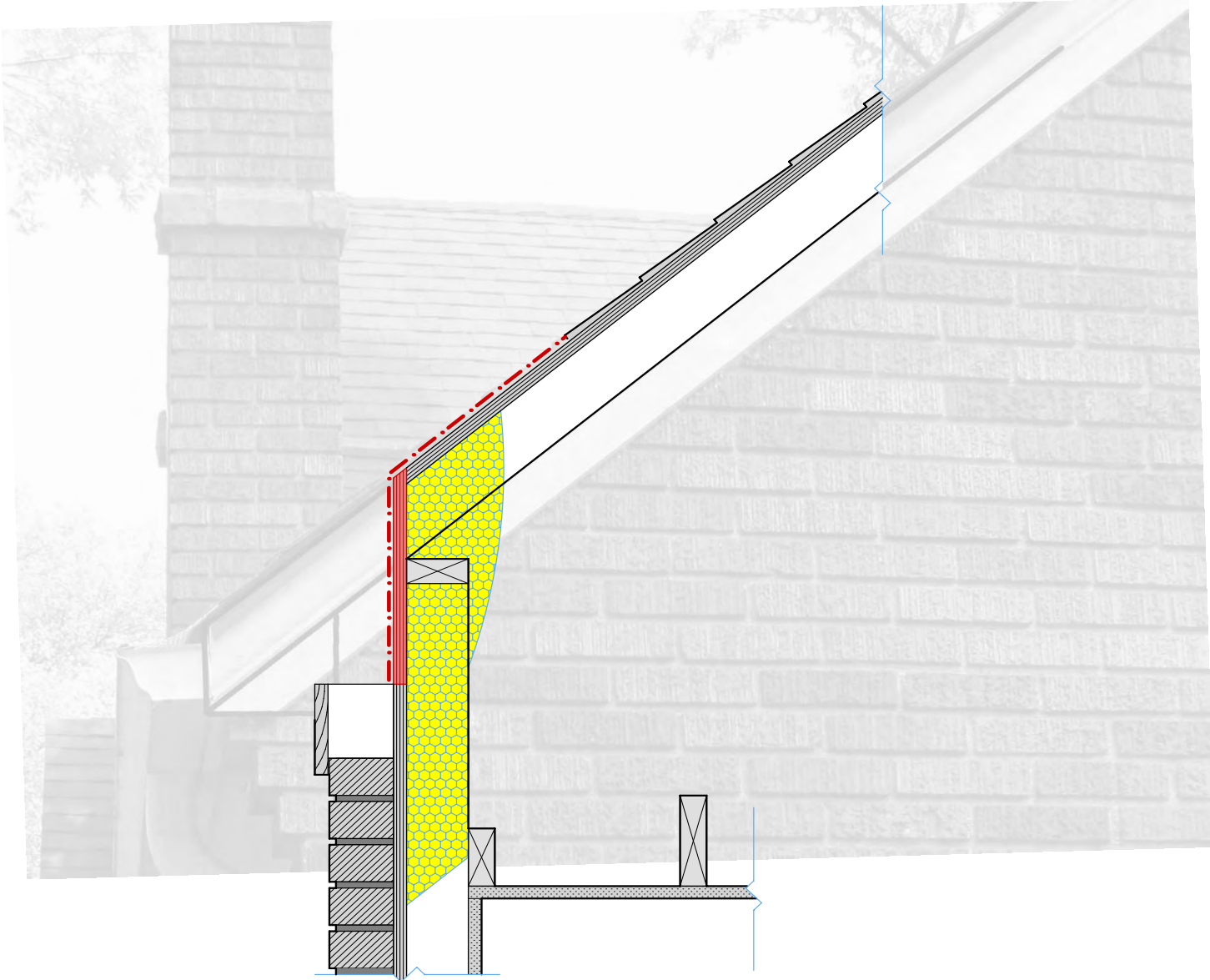
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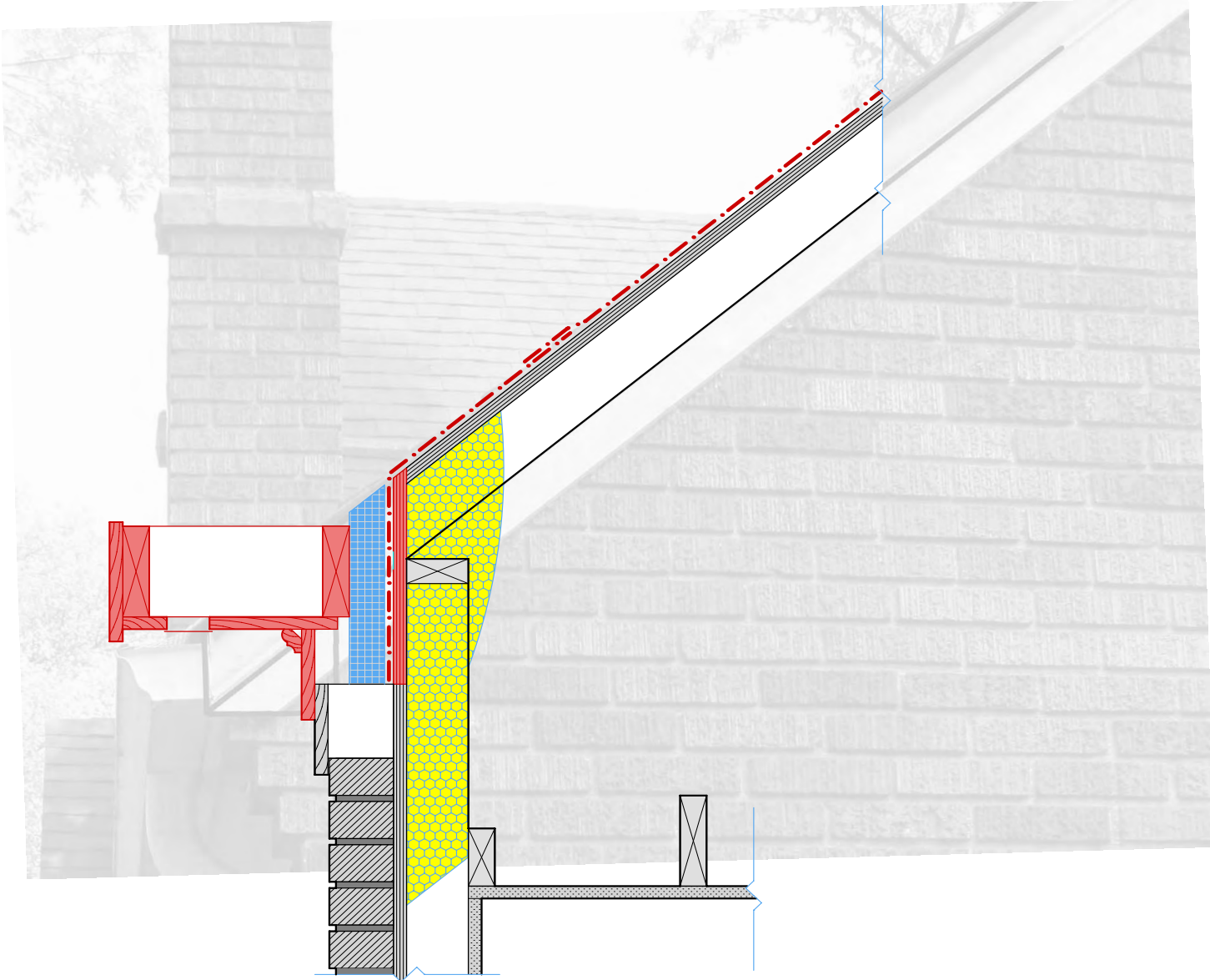
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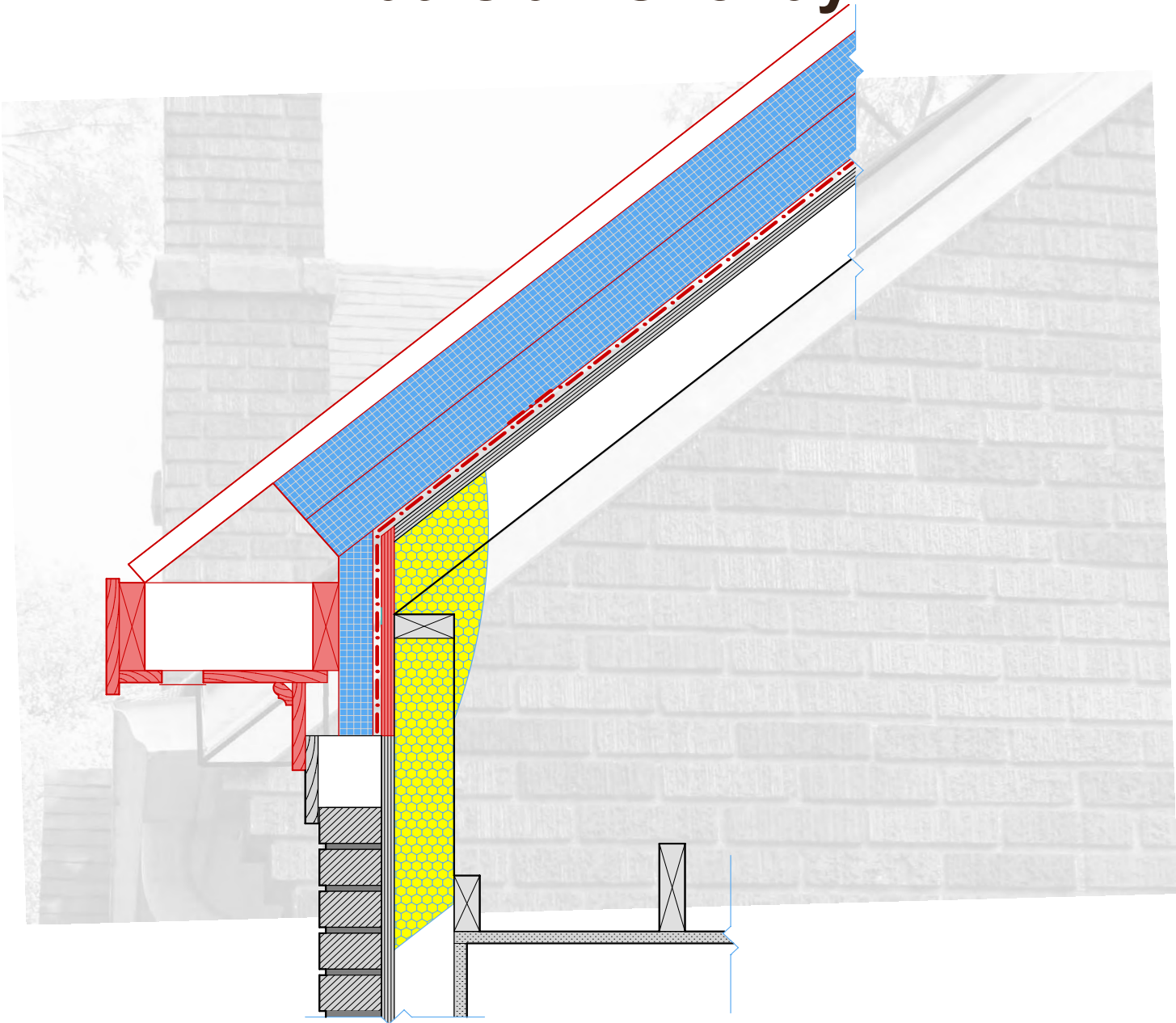
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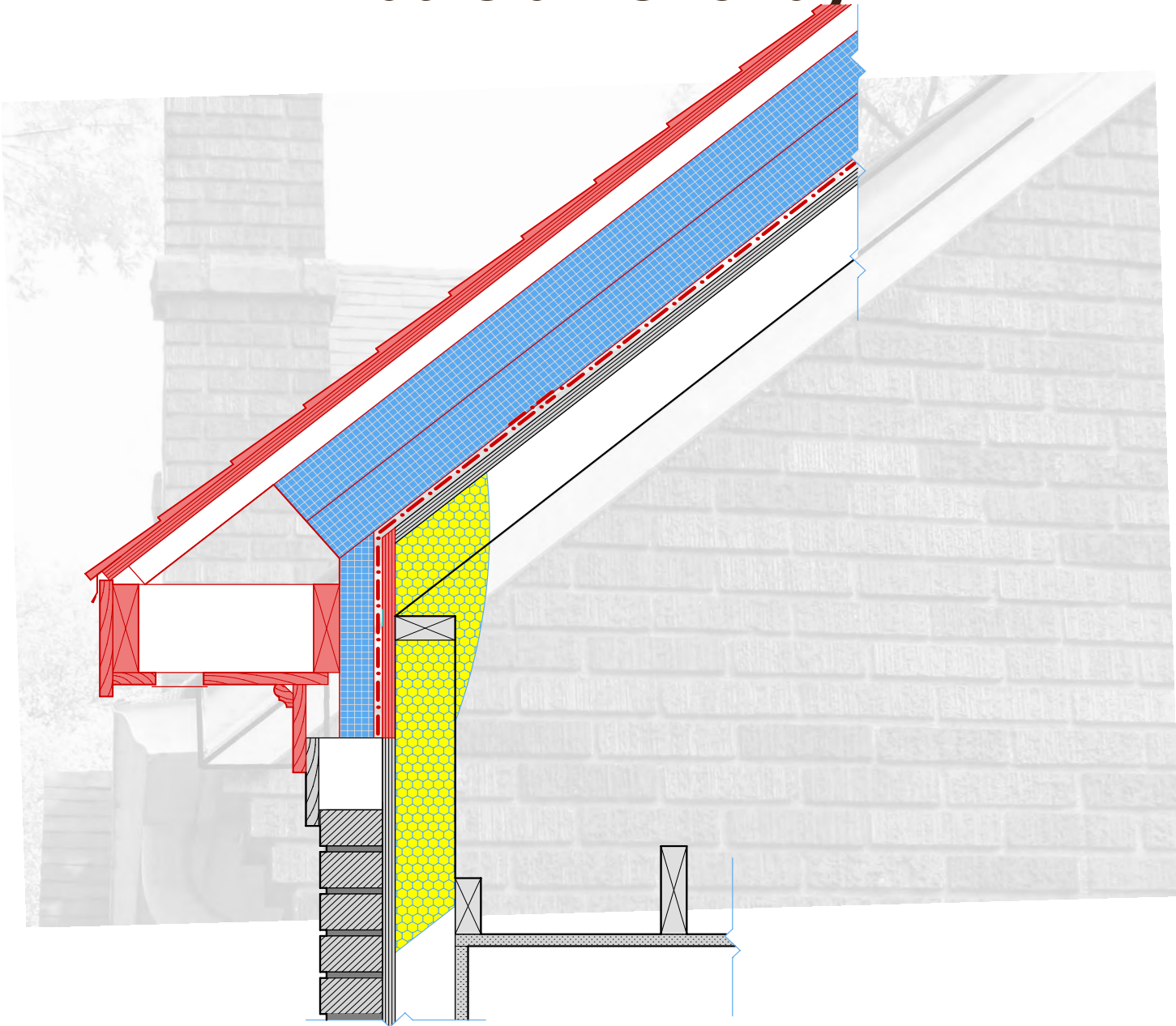
# What is an Overlay?



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# What is an Overlay?





# Planning

1. Identify areas affected by elevating roof deck 6"

# Planning



# Planning



# Planning



# Planning

1. Identify areas affected by elevating roof deck 6"
2. Eliminate roof penetrations

# Planning



# Planning

1. Identify areas affected by elevating roof deck 6"
2. Eliminate roof penetrations
3. Sequence Tear off and Dry-in

# Planning





# Remove Existing Attic Insulation



# Demo



# Demo



# Air/Vapor Control



# Air/Vapor Control



# Air/Vapor Control



# Air/Vapor Control



# Air/Vapor Control





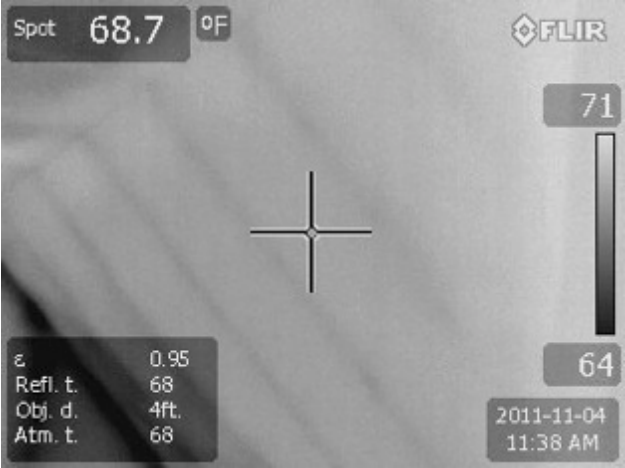
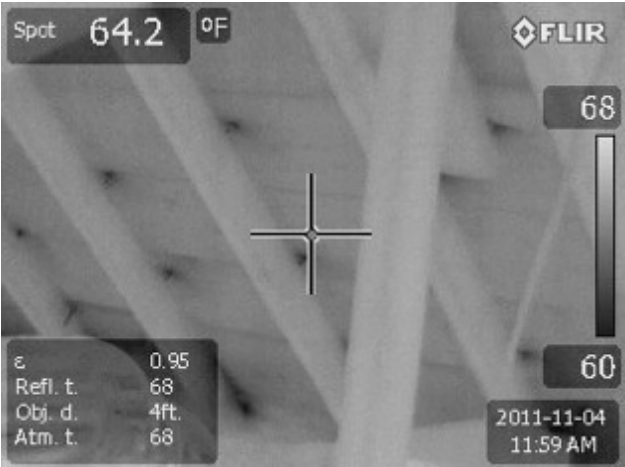
# Air/Vapor Control



# **Air/Vapor Control**

Air Test!

# Air/Vapor Control



# Insulation Details



# Insulation Details



# New Soffit/Eave Detail



# New Soffit/Eave Detail



# Insulation





# Insulation



# Insulation



# Frame Venting Sleepers



# Frame Venting Sleepers



# Frame Venting Sleepers



# Soffit Venting



# Soffit Venting



# Soffit Venting





# Soffit Venting



# Roofing



# Roofing



# Roofing



**Finished!**

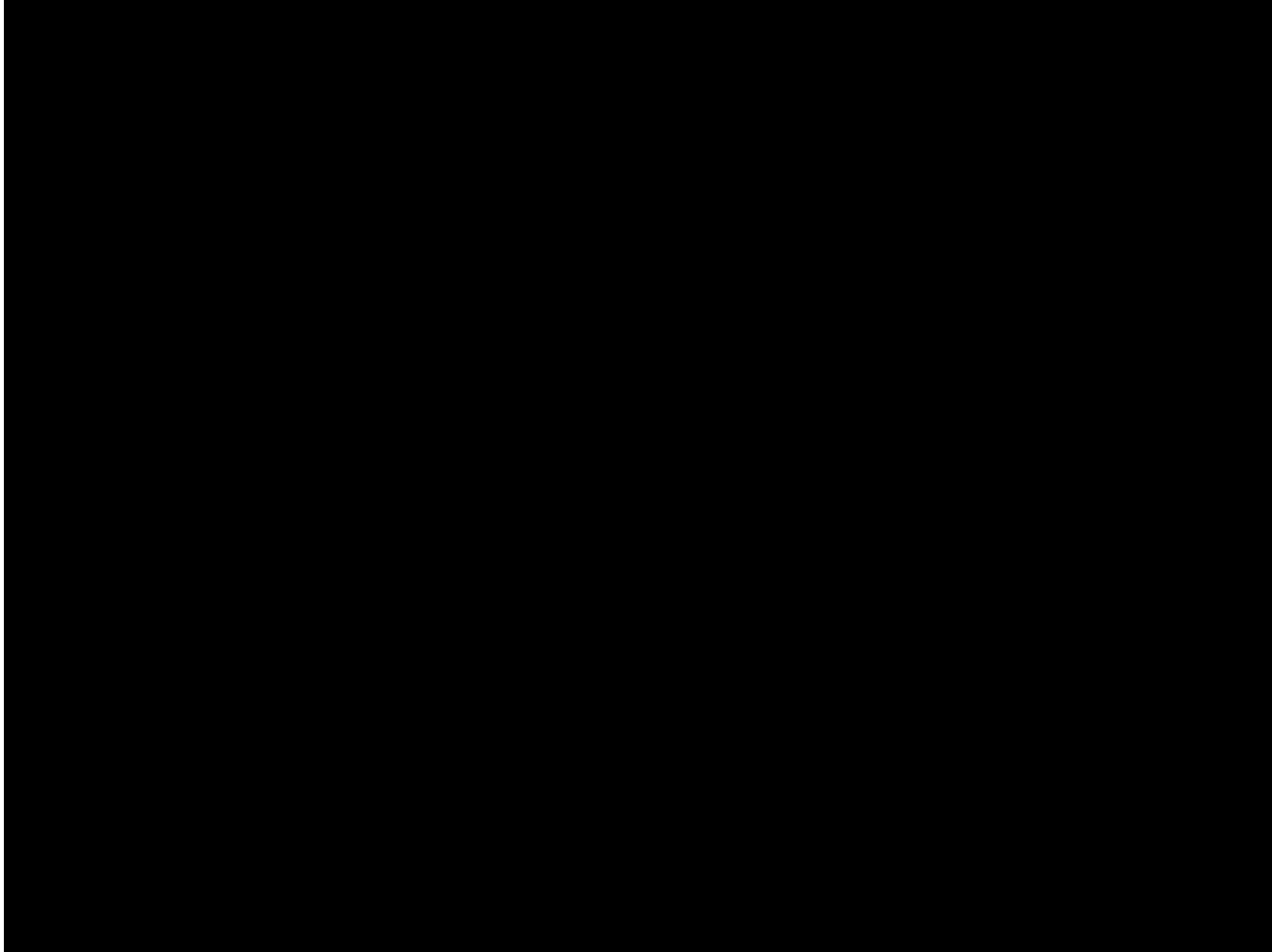


**Finished!**



# Final Testing

# Final Testing





# Results

## Overcoat: Case 1

MEASUREMENT	PRE TEST		POST TEST		REDUCTION
Air Leakage (CFM50)	2371	-	1880	=	491 CFM50
Air Changes (ACH50)	4.93	-	3.9	=	1.0 ACH50

# CASE 1



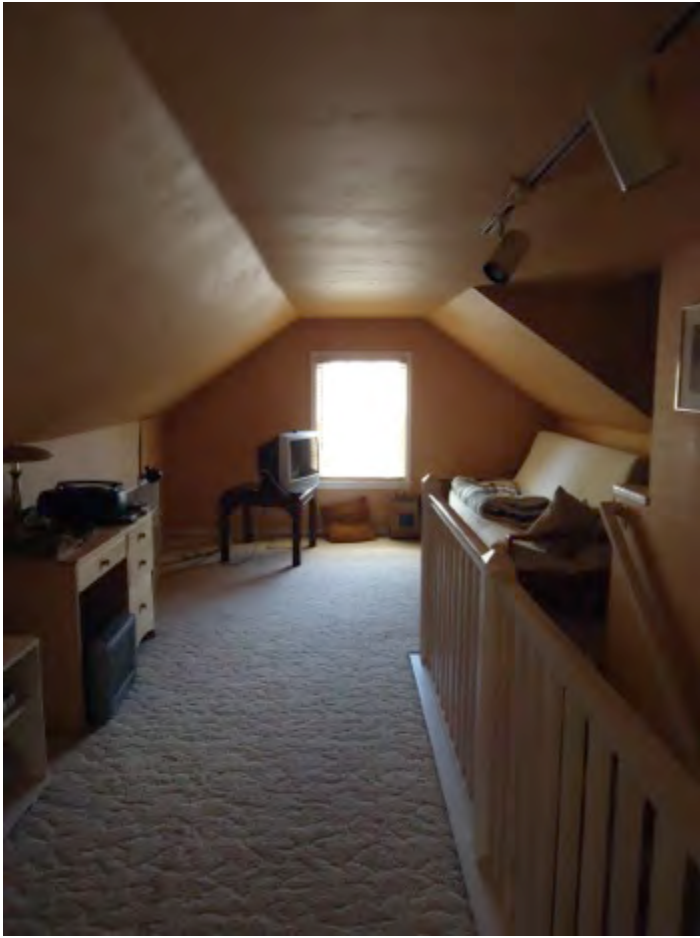
# Existing House



# Existing House



# Existing Upper Level



# Existing Insulation



# Demo



# Demo





# Demo



# Membrane



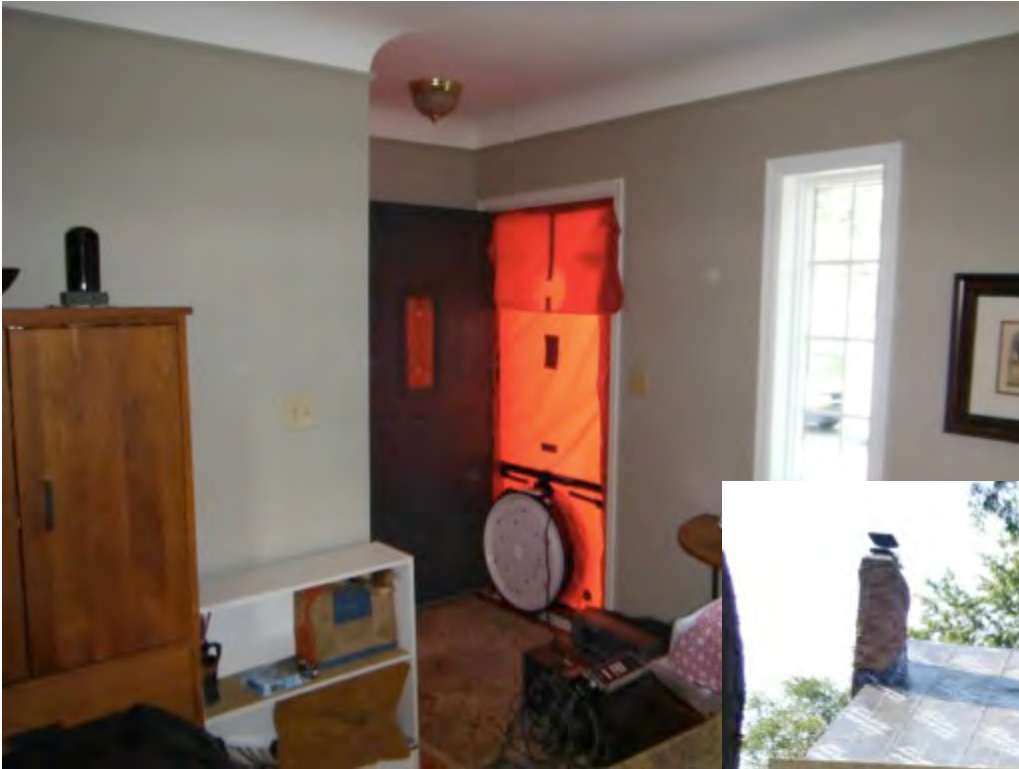
# Membrane



# Membrane



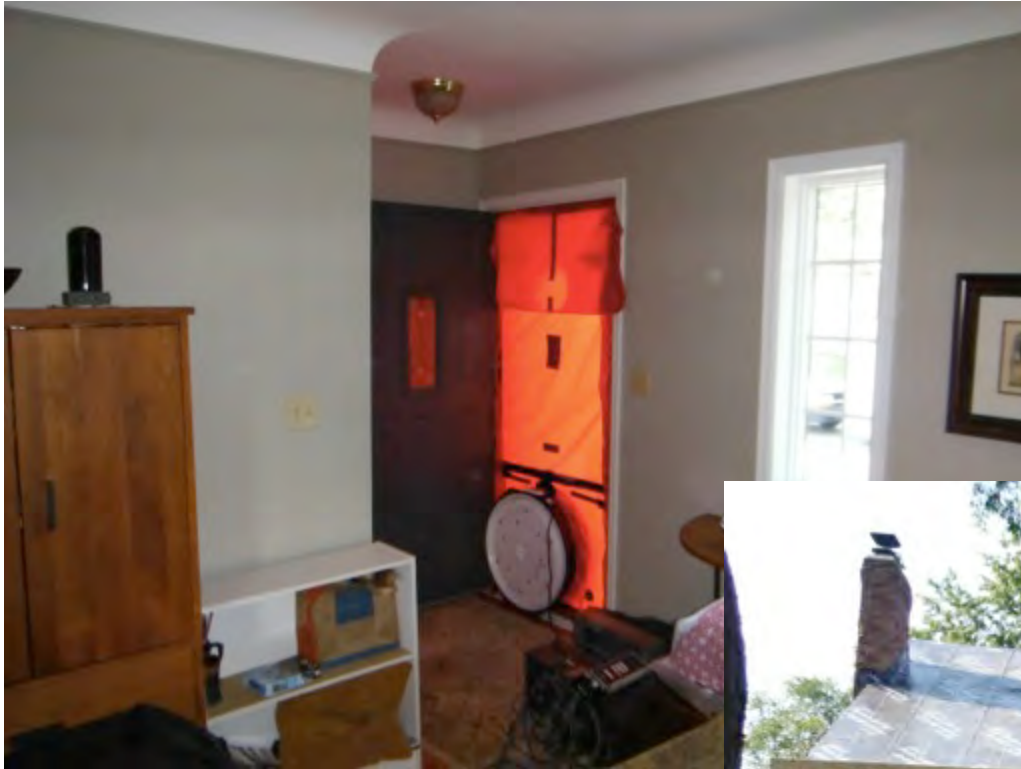
# Air Test



# Insulation



# Air Test Again!

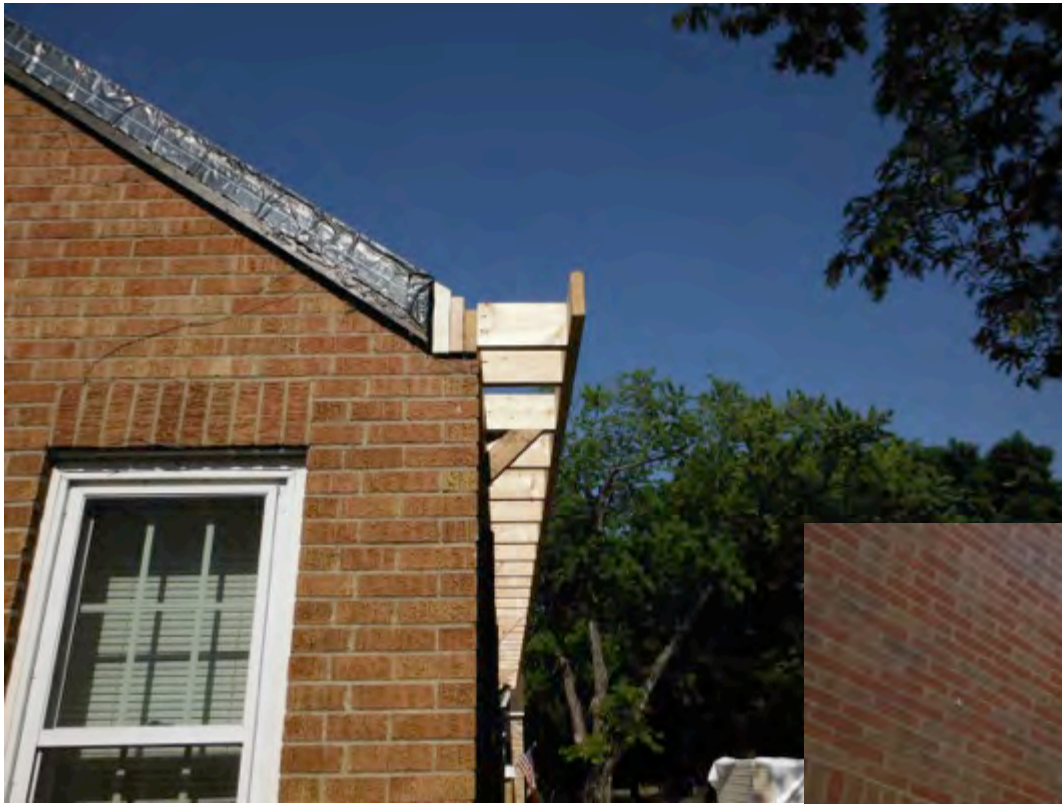


# Framing New Soffit/Eave Detail





# Framing New Soffit/Eave Detail



# Insulation



# Insulation



# Insulation



# Frame Gable Rakes



# Frame Gable Rakes



# Frame Venting Sleepers



# Frame Venting Sleepers





# Roofing



# Roofing



# Roofing



# Roofing



# Finished!



**Finished!**



**Finished!**



# Results

## Overcoat: Case 2

MEASUREMENT	PRE TEST	POST TEST	REDUCTION	% REDUCTION
Air Leakage (CFM50)	2925 CFM	1289 CFM	1636 CFM	56%
Air Changes (ACH50)	7.02	3.09	3.93 ACH	56%



# RESULTS

1. Thermal imaging done in conjunction with blower doors suggests very effective air sealing method
2. Eliminated ice dam formation (as a result of heat loss)
3. Occupants reported significant comfort changes
4. Comparative effectiveness for air leakage is not readily available without knowing percent of leakage from treated surface area
5. Assume equal leakage per square foot of surface area

# CANDIDATE FOR OVERLAY

1. Finished attic space
2. House has heat loss performance issues
3. Needs new roof
4. Needs Eave and Cornice work
5. Client can afford it!

**THANK YOU!**



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