

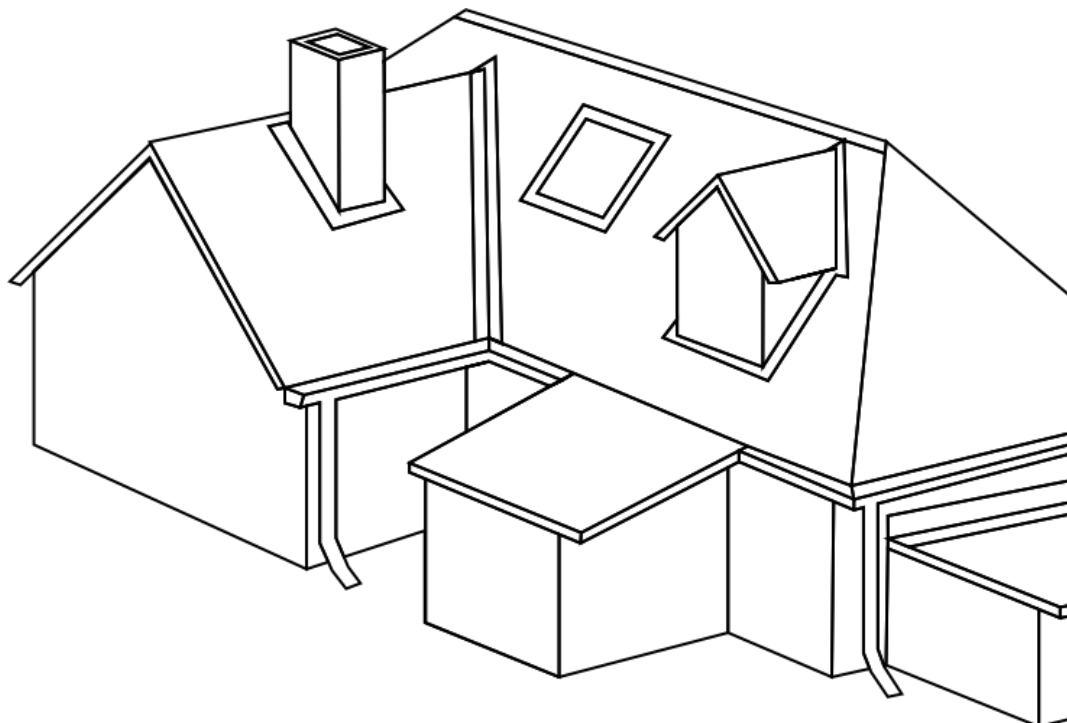


ROOFING EDUCATION

QUICK REFERENCE GUIDE

ROOFING MANUAL

Business⁴¹¹



Residential vs Commercial

Residential Projects

Residential Roofing projects are typically considered as sloped-roof homes. Although some Residential homes have flat portions or are fully flat roofs, they are most often sloped roofs.

The most common roof materials installed on these projects are:



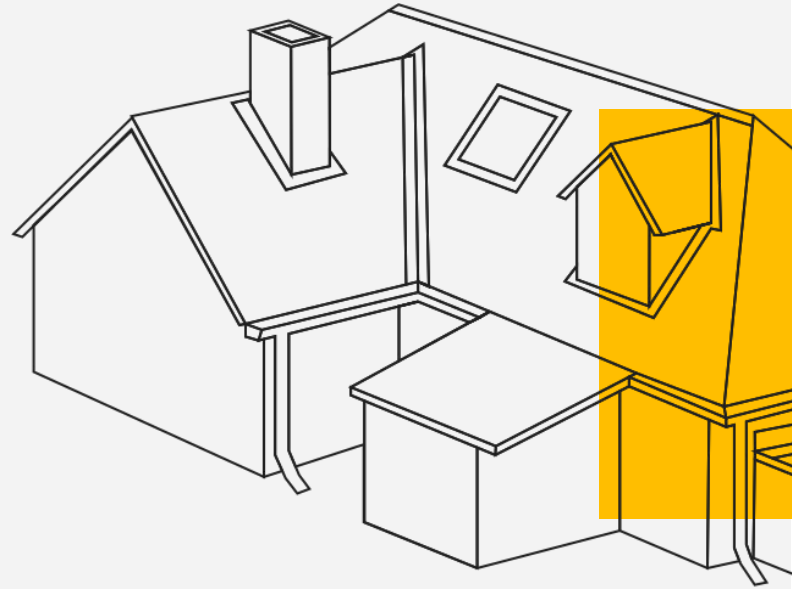
Shingle



Metal



Tile



Commercial Projects

Commercial projects usually have a low slope or flat roof and are much larger than residential projects. Commercial projects are typically categorized as multifamily buildings, warehouses, factories, apartments, retail stores, malls, and similar structures.

These are the most common systems for commercial projects:



Single-Ply



MBR



BUR



Coating



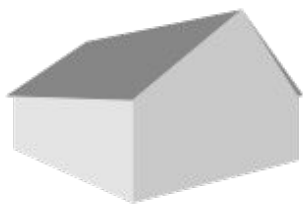
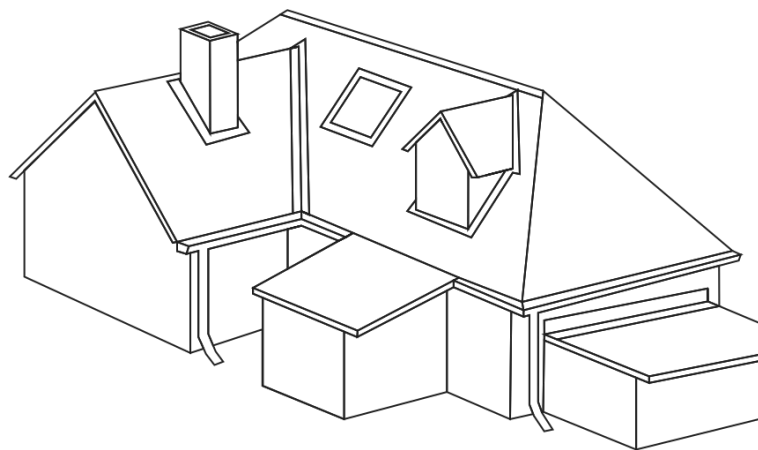
Metal



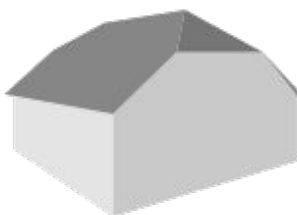
Residential Roof Shapes

Styles of Roofs

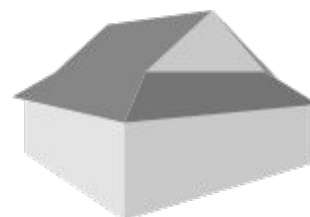
No roof is the same. Architectural design and creativity allow for many different roofs, all designed to suit your needs somehow. Helping homeowners choose the right system for their home may rely on its style and construction. It's also important to be able to identify roof shapes for better documentation during the insurance claim process.



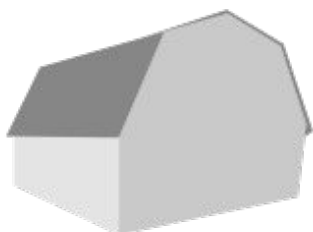
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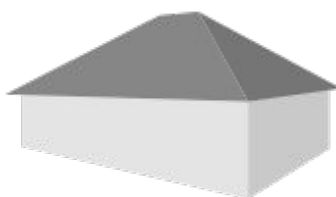
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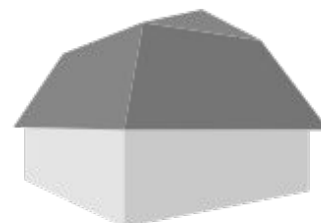
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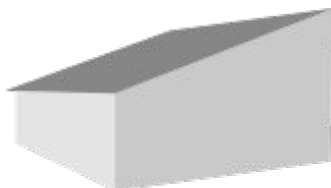
GAMBREL



HIP



MANSARD



SHED



FLAT

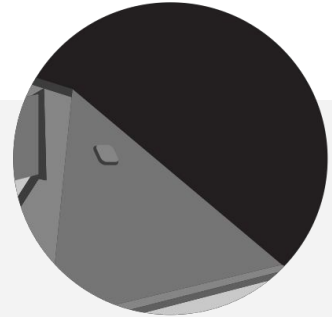
Parts of a Sloped Roof

Ridges



The ridge is often the single longest line that can be seen on most rooftops, and it designates the highest point of the roof's frame, usually running along the attic itself. Most properties have a single ridge, but larger structures can feature multiple ridges.

Hips



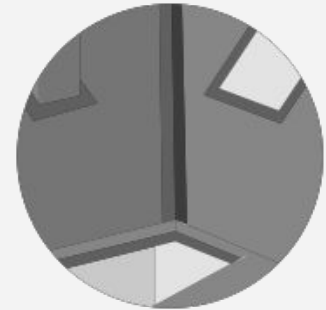
Hips are the down-sloped ridges formed at the intersection between two sloping roof planes. Many popular styles of homes feature hip roof designs, including: "Hip and Valley", "Overlaid Hip", "Cross Hipped", and "Pyramid Hipped".

Flashing



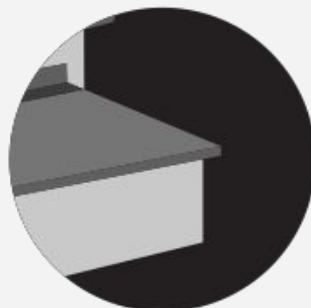
Flashing is resistant molding that prevents water from infiltrating the roof. There are various types of flashing, including aluminum, galvanized steel, and plastic. You'll find flashing among the most common places in valleys, at the bases of chimneys, and around roof vents. If the flashing is applied to an area located on an incline (like chimneys or dormers), "step flashing" is used.

Valley



Valleys are the "V-cut" angles formed along the junction of two slopes of a roof. As their name implies, valleys dip inward, making them opposite hips, which project outward. Since valleys are particularly vulnerable to water damage, they are commonly reinforced with a specialized underlayment membrane. In many cases, a "valley flashing" is also installed to help divert rain from the valleys to the gutter system.

Drip Edge



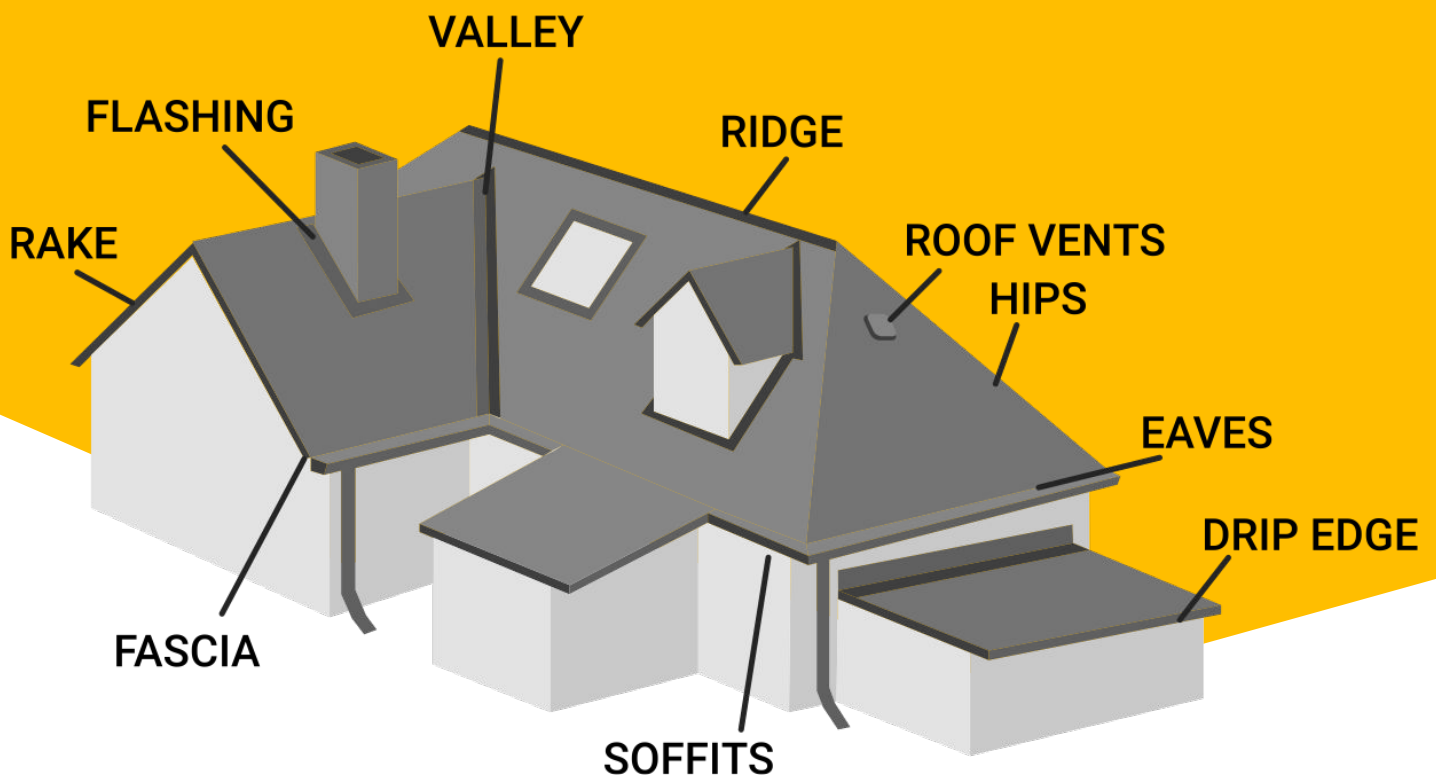
Drip Edge is a metal molding designed to prevent rain from infiltrating the roof by directing water away from shingles near your eaves and gutters. Drip Edge is crafted in an L-shape, which attaches to the edge of the roof.

Decking

Roof decking is a critical structural feature of a home. It's commonly made from 1/2-inch plywood. Its purpose is to enclose the roof structure, reinforce its strength, and provide a sturdy nail bed for shingles.

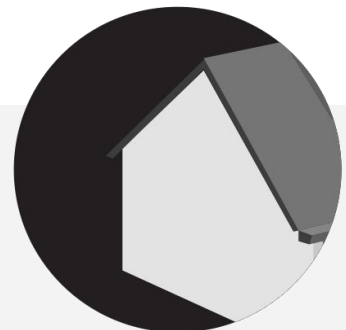
Parts of a Residential System

As a roofing professional it's vital that you know all about roofing systems and the terms that define each component.



Eaves

Eaves are the horizontal edges of a roof. It's where your roof meets your gutters. Under the covering of an eave, you will also find an "eave membrane." This membrane goes under some (or all) shingles to prevent water infiltration caused by "ice dams" in the winter.



Rakes

Rakes are the angled edges of your roof. While eaves are entirely horizontal, rakes are set at an angle. If an edge isn't parallel to the ground, you're looking at a rake.

Parts of a Sloped Roof

Soffits



Soffit is the term for the enclosed underside of any overhanging eave. Soffits cover the eaves of the roof, hiding visible rafters from sight. More importantly, soffits allow air to be captured and circulated through the roof system, directed to the attic, improving circulation, regulating temperature, and preventing moisture damage.

Fascia

Fascia is the long, straight boards that run along the lower roofline and support the bottom row of shingles or tiles. These boards prevent damage to the roof (as well as the home's interior) by blocking moisture from getting in. Fascia is fixed to the roof's lower trusses, allowing it to carry the additional weight of the gutter system. While most fascia boards are made from wood, materials like vinyl, aluminum, and plastic are also available. Aesthetically, fascia creates a smooth appearance along the roof's edge and gives you the option of adding an extra splash of color to your home.

Roof Vents

Roof vents including ridge vents are an essential part of a well-ventilated home. These enclosed structures draw air from soffit vents located at the base of the roof and help regulate the temperature while also preventing the accumulation of moisture.

Underlayment



Underlayment is an asphalt-saturated felt or synthetic fabric sheet installed between the roof deck and the roof's outer layer to provide additional weather protection. The underlayment helps the roof shed water while protecting the outer layer from resin released by the decking.

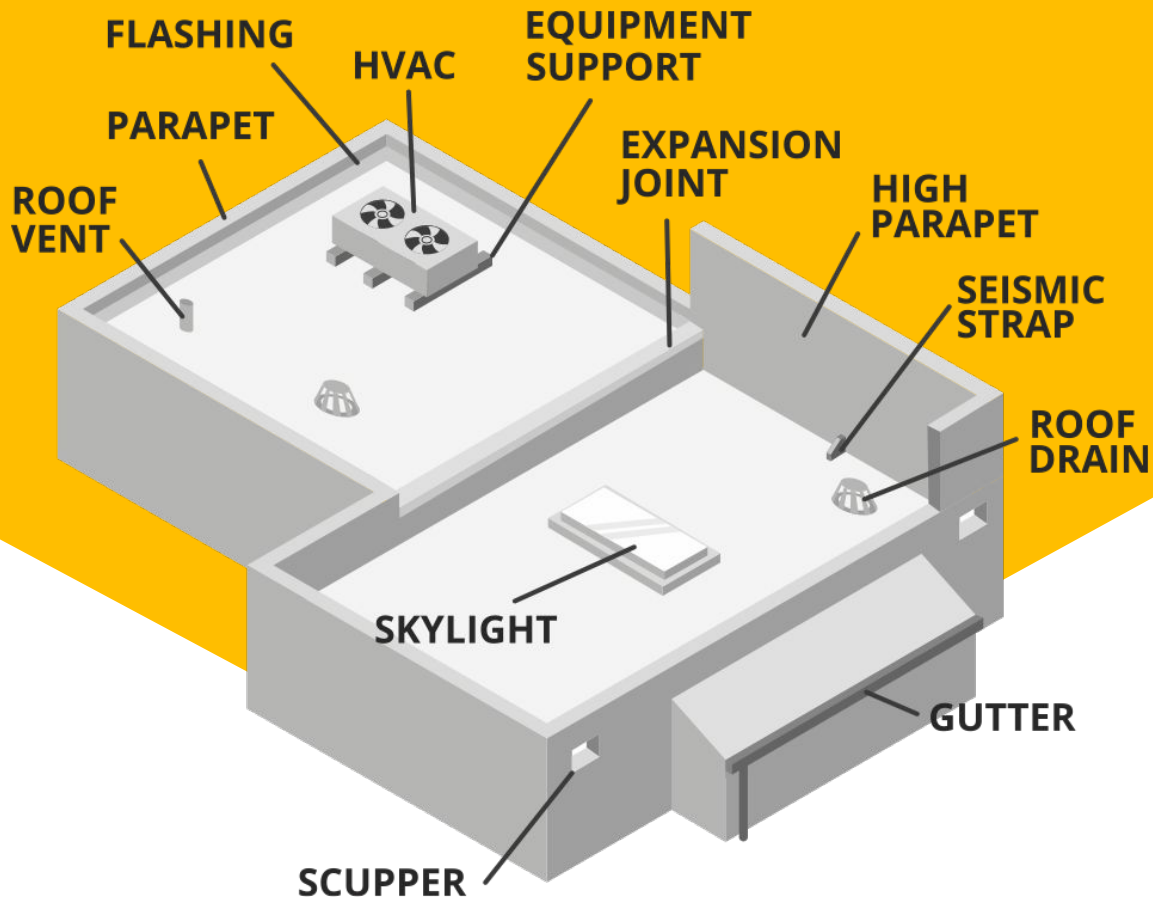


Attic

The attic is the space between a roof and the rest of the home. A properly ventilated attic helps protect the roof system from excessive heat in the summer and moldy moisture in the winter. Attic ventilation can be drastically improved when you install soffit vents. Having a roof that's correctly insulated and ventilated makes a significant impact on the durability, efficiency and sustainability of a home.

Parts of a Commercial Roof

Commercial roofs come in a variety of shapes and sizes. The following are common parts of a commercial roof system.



Equipment Support

On most Commercial Roofs, there will be equipment, like HVAC units, held up by an additional platform to help support the weight of the unit and elevate it from water ponding. These supports need to be considered when flashing the roof.



Expansion Joint

Joints are the space or opening between two or more adjoining surfaces. An expansion joint is a device used to permit a structure to expand or contract without breakage.

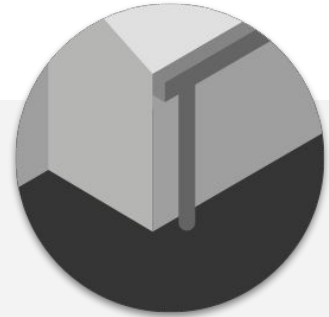
Parts of a Commercial Roof

Flashing



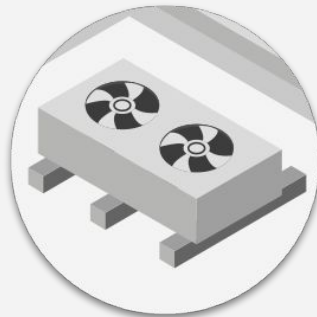
Weatherproof material installed between roof sheathing (or wall sheathing) and the finish materials to help keep moisture away from the sheathing. Flashing should also be installed around any supports or protruding equipment on the roof.

Gutter



In some commercial roofing systems, gutters, metal troughs at the eaves of a roof to carry rain water from the roof to the downspout, are common for sloped portions of the roof or to collect water from scuppers.

HVAC



HVAC (Heating Ventilation and Air Conditioning systems) are very common to see on commercial roofs. They control the temperature, humidity, and purity of the air in the building. There may be multiple structures for the HVAC system on the roof surface that you must account for when installing a new roof system.

Parapet



A low wall around the perimeter of a roof deck. The primary function of a parapet wall is to protect the edge of a roof assembly from destructive wind forces called vortices and act as a barrier to accidental falls. In commercial construction, parapets are common and they are often required.

High Parapet



Some commercial structures will have varying heights of parapet walls. These may just be a design choice or additional wind/accidental fall protection.

Roof Drain



In roofing, a drain positioned on a roof at some location other than the perimeter. It drains surface water inside the building through closed pipes to a drainage system.

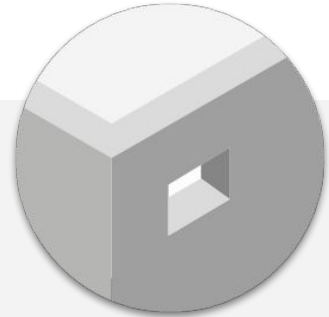
Parts of a Commercial Roof

Roof Vent



Several different vents can protrude from one commercial structure to provide ventilation of gasses. Small vent pipes and vent stacks (for air circulation) are some examples.

Scupper



Scupper drains are incorporated into the walls or parapet. Usually, scuppers are part of the backup drainage system that helps the roof shed excess stormwater. Many roofs will have multiple scuppers.

Seismic Strap



Seismic straps are also known as earthquake straps. These are straps that brace or anchor the parapet walls in the event of an earthquake or high winds.

Skylight



A structure on a roof that is designed to admit light and is somewhat above the plane of the roof surface. These are design features common on residential and commercial roofs.



Sloped Roofs

Many Commercial Buildings, Multifamily, and Apartments may utilize a sloped roofing system. We outline these systems in our Residential Roofing Manual Vol. 1. The systems are similar in application, just usually on a larger scale. They may also include some sections that are flat or require coatings, like metal roofs.



Layers of a Commercial Roof

The layers of the commercial roof will vary depending on the roofs previous systems.

1 Base

The base of a common, flat roof commercial structure starts with the steel roof decking. This could consist of corrugated steel panels supported by a system of steel roof trusses including gutter and fascia trusses. Purlins, anti-sag rods, and knee bracing typically make up what lies underneath the steel panel base layer of the roof.

2 Vapor Barrier

Vapor barriers, or vapor retardants, are an optional layer in the roof foundation. The roof will have a vapor barrier installed if the interior use of the building requires AC and if the climate of the area the building is located in calls for additional protection from humidity.

3 Roof Insulation

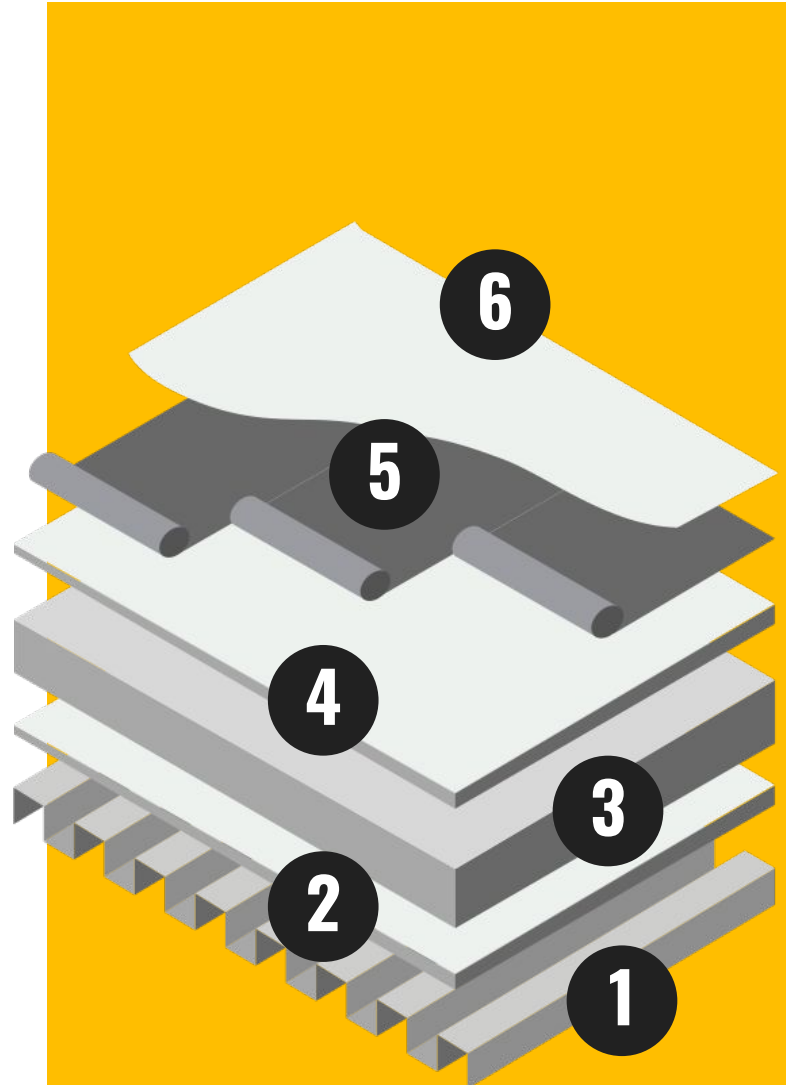
Flat roofs have a very low slope and get direct sunlight consistently. Roof insulation is crucial for regulating the heat and moisture absorbed.

4 Deck

An additional deck layer may be added for more support between the insulation and membrane.

5 Membrane/Asphalt

This is the layer of the main waterproofing system for the roof. This may be a popular singly-ply roofing system like TPO, EPDM, PVC, etc, or an asphalt system like BUR.



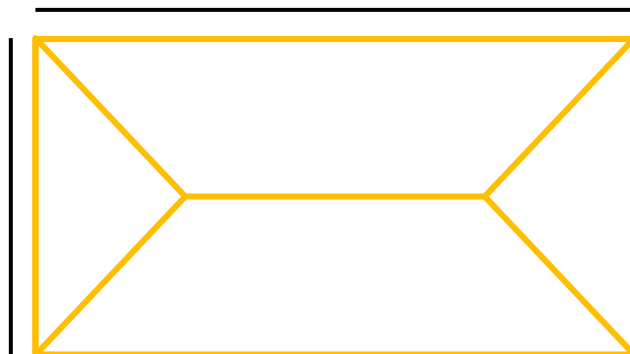
6 Coating

Roof coatings are designed for protecting commercial roof systems and extending the life of existing roof coverings. They provide additional waterproofing and insulation. Roof coatings are a good alternative to a roof replacement. At roughly half the cost of a replacement, coatings can extend the life of a flat roof up to 10 years.

Measuring a Roof

Roof Measurement Methods

Getting correct measurements of the roofing project is vital. Wrong calculations can lead to issues like underbidding the project, ordering too much or too little materials, and more. Every roofer has its approach to roof measurements. Some prefer hand measuring, while some companies invest in digital measuring tools or reports.



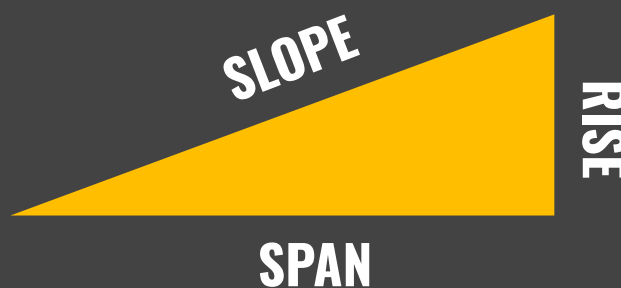
Manual Measurements

For years, roofing contractors have trusted the tried-and-true method of getting an accurate measurement by hand. This means that orders are more precise, and waste on jobs will decrease because there's less room for error in measurements taken this way (but calculation mistakes can happen anyway.) The downside is, this is the most time-consuming process.



Digital Measurements

Aerial technology has been available for close to 15 years, and it offers some significant advantages over the traditional ground method. This new 3D modeling system creates accurate measurements with an accuracy rate that can reach 95%.



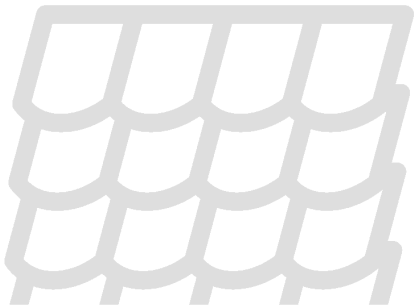
ROOF PITCH



Types of Roofing Materials

Today, there are many types of resilient and technology products for homes. While asphalt shingles remain the most popular type of roof covering, time-tested materials such as slate, barrelled clay tiles, and cedar shake are popular on high-end residential properties. The newest forms of roofing material include durable composite and rubber roofing, often utilizing recycled elements. Solar roofing, also known as photovoltaic glass tile roofing, is also growing in appeal as it continually is improved and refined to complement architectural aesthetics.

Traditionally, metal roofing is most associated with utilitarian structures such as barns, but it doesn't always take the form of sheets and panels. Metal roof tiles or shingles are standard, as well - a type of roofing material that can be highly durable and attractive.



Roof Material Quick View

Material	Cost per SQ	Durability	Aesthetic
Shingle			
Metal			
Tile			
Slate			

What Material is Best for Your Area

An area's climate can influence what type of roofing will best perform under unique weather conditions. All forms of residential roofing materials perform well. Asphalt shingles are most prevalent throughout the US.

Types of Roofing Materials



Shingle



Low Cost
Easy to Install and repair
Variety of Colors
Most common roof material
Fire Resistant



Low durability, can only last about 20 years with maintenance and in perfect weather conditions
Easy damage from wind or mildew
Not energy-efficient
Low curb appeal compared to other roofing materials

Shingle Roofing

Shingle roofs provide a versatile and stylish design for your home. They come in a wide range of colors, shapes, and sizes with an affordable and aesthetically pleasing option- siding! Shingle Roofing is efficient, rugged, and easy to install.

They have an underlayment system that helps with insulation; high-quality shingles are essential for staying put in inclement weather conditions like heavy winds or rainstorms that can damage other roof types quickly come off these tiles if not installed right away.



3 Tab Shingles

A 3-tab shingle is distinguished by three uniform cutouts, or tabs, made along the lower edge of the shingles.



Architectural Shingles

Also known as laminated or dimensional shingles, architectural roofing shingles are among the highest-quality roofing products made. Traditionally, they are composed of a heavy fiberglass mat base and ceramic-coated mineral granules tightly embedded in carefully refined, water-resistant asphalt.

Types of Roofing Materials



Metal



Durable and lightweight
Low Maintenance
Energy Efficient and Recyclable
Variety of Colors and Finishes
Can be installed over existing roofs
Fire Resistant



High initial Cost
Maintenance may include Refinishing or Painting
More Complex to Install

Metal Roofing

Metal roofs are durable, environmentally friendly, and efficient. They also happen to be stylish! With so many options for metal styles available these days, it's never been easier or more convenient than now is the time you should invest in your home improvement needs.

The durability and fire resistance of metal roofs are two significant benefits. Not only do they protect your home from structural damages, but they also make it difficult for fires or lightning strikes to spread up the house like normal shingle roofs would.



Standing Seam

Standing-seam metal roofs are a great way to add character and curb appeal. These flat metal sheets can be installed on homes in just about any shape or size with no need for complex shingles! They come in many different colors, so you'll have plenty of variety.



Stone Coated Steel

The durable stone-coated steel is more than a match for traditional metal roofs, which can dent and ding over time. The benefits are that this quality nearly eliminates maintenance costs of your existing roof while also protecting against gusting winds in heavy rain or hail storms.

Types of Roofing Materials



Concrete and Clay Tile



Attractive and High End
Concrete version is Durable and lower cost than Clay
Low Maintenance
Variety of Colors and Styles



Clay is more susceptible to damage
Complex to install
Clay tiles are heavy weight
Expensive material
Colors can fade over time

Tile Roofing

Tile Roofing is a durable, long lasting roof that can withstand high winds. The gaps between tiles reduce heat from shining in and help conserve energy costs for those who have it installed on their home or business.

A tile roof is a durable, low-maintenance option that will look great on your house for decades. The durability makes it easy to maintain and protect from the elements like pests or weather damage.



Barrel Tile

Clay and concrete tiles can outperform many other roofing materials. However, clay is the more durable of the two, with the ability to last well over 100 years instead of concrete tiles that can last 30 to 50 years.



Slate Style

Slate is one of the longest-lasting roofing options available on today's market. Slate shingles can last as long as 200 years in favorable environments. The slate will maintain its composition for decades on end. Shingles composed of challenging slates can last anywhere from 75 to 200 years.

Types of Roofing Materials



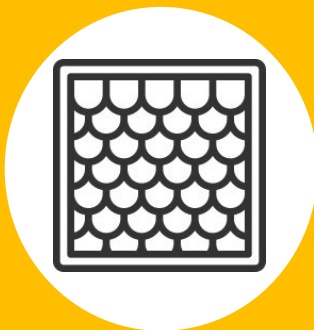
Slate Tile



Long Life Span
Durable, Mold Resistant and Fire Resistant
Increases Home Value



Brittle
Routine Maintenance
Costly
Very Heavy



Shake Tile



Workability
Weather Resistant
Insulating
Aesthetically Pleasing



Poor Longevity
Vulnerable to Pests
Not Mold Resistant
Discolor Quickly
Vulnerable to leaks

Other Roof Systems:

- Rubber Roofing
- Cedar Shake
- Composite Tiles
- Photovoltaic Glass Tiles
- Solar Roof Tiles
- Roof Coatings
 - Polyurethane Spray Foam
 - TPO Roofing
 - PVC Roofing
 - EPDM Single-Ply Roofing
 - Modified Bitumen Roofing
 - BUR Roofing
 - Torch-Down Roofing



Commercial Materials Overview

This section covers the most popular forms of commercial roofing:

- Single-Ply
 - TPO - Thermoplastic polyolefin
 - EPDM - Ethylene propylene diene monomer
 - PVC - Polyvinyl chloride
- MBR - Modified bitumen roofing
 - MBR APP
 - MBR SBS
- BUR - Built-up roofing
- Metal Roofing

Fill out the overview chart below using numbers from 1 (=low benefit)-to-5 (high benefit). Which materials are more durable, easier of install, cost effective, and suitable for properties in our region. If there are additional flat roofing techniques you use, utilize the worksheets to outline those processes.



Roof Material Quick View

System	Durability	Application	Cost	All-Weather
EPDM				
BUR				
TPO				
PVC				
METAL				

What Material is Best

An area's climate can influence what type of roofing will best perform under unique weather conditions. All forms of commercial roofing materials have pros and cons. Understanding what the client needs and building requires will help narrow down the right system for them.



Roof Repair vs Replacement

It's not always easy for homeowners to tell when they need a new roof or urgent roof repairs. It's important to note these key indications that suggest roof repairs are required.

If the roof is 10+ years old, you may need to question whether the roof needs to be totally replaced with the homeowner and educate them on that process.

Visually inspect the roof for cracked, torn, bald, or missing shingles

1

Scan the roof for loose materials or wear around chimneys, vents, pipes, etc.

2



Look out for excessive shingle granules in gutters. This is an indicator of advanced wear

3

Examine drainage, ensure gutters and downspouts are secured. Ensure drains are open and allow water to flow and gutters and downspouts are free of obstructions.

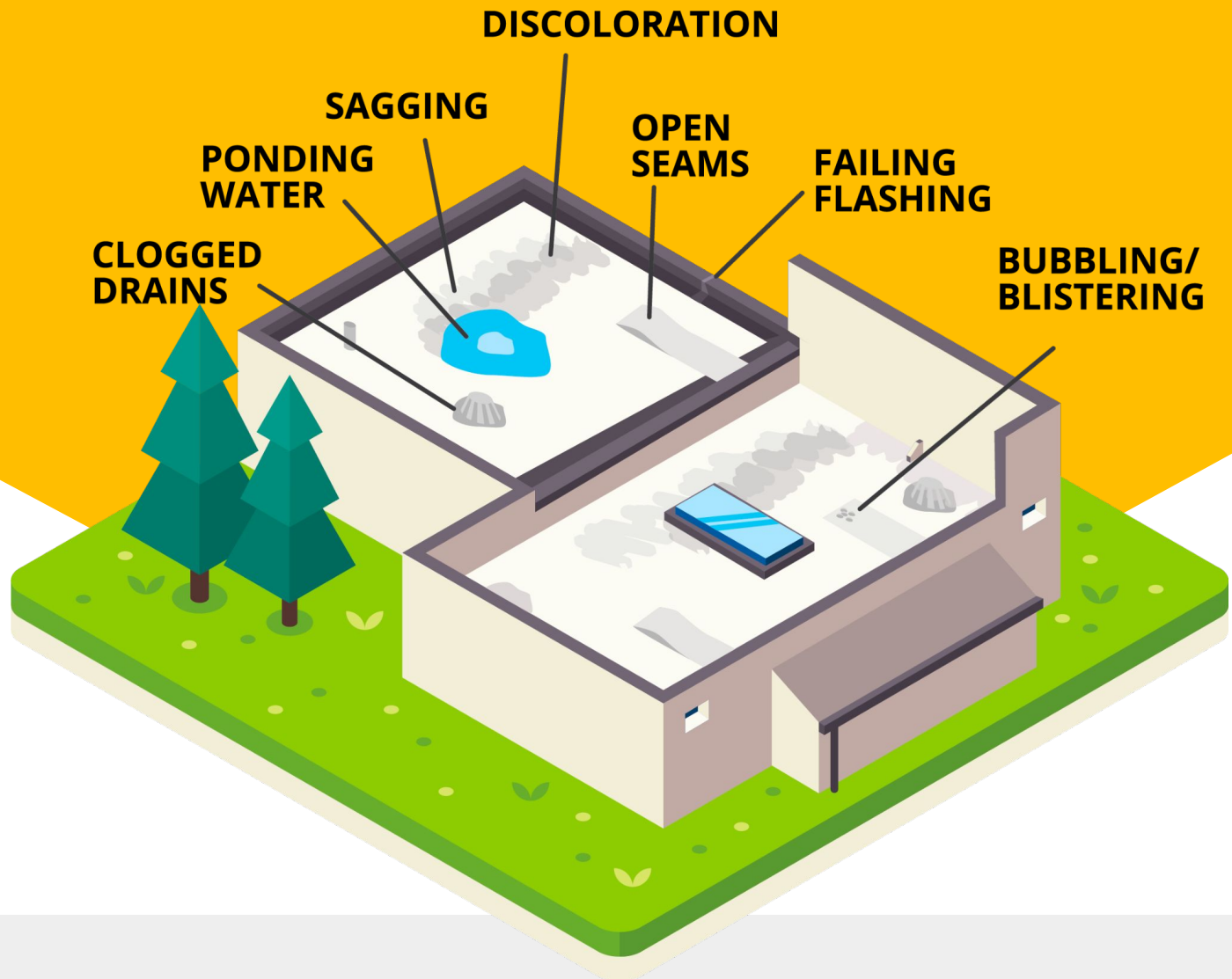
4

Other Signs of Damage

- Tiles or shingles that are missing, loose or worn
- Excessive rust or gaps in metal roof seams
- Worn coatings or membranes on commercial roofs
- Granules from shingles collecting in gutters
- Loose or missing flashing, especially around chimneys or vents
- Inadequate or blocked ventilation
- Discoloration of roofing shingles or panels
- Mold growth
- Punctures or tears
- Stains on exterior walls
- Stains on the underside of the roof decking
- Loose, gapped or leaking gutters
- Blocked downspouts

Signs of Commercial Roof Damage

An aging or damaged commercial roof system will exhibit some or all of the damage indicated below.



Types of Damage

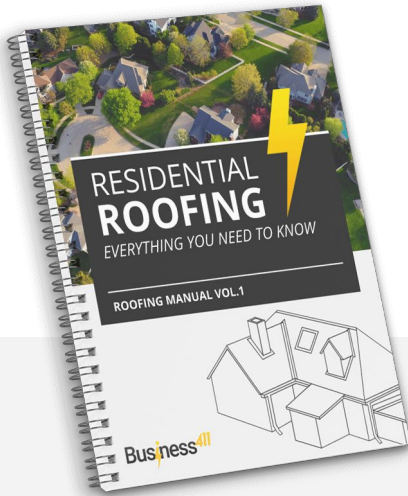
- Signs of moisture penetrating the roof system showing through ceiling stains or insect/rodent problems.
- Abnormal Increase in energy bills due to the roof not cooling properly.
- Sagging or low areas of the roof surface indicate water build up and failing roof support from water damage.
- Mold/Bad Odors can manifest within the building if moisture is getting into the insulation and walls from the roof.
- Blistering or bubbling of the roof surface means that water is getting trapped between failing layers of the roof system.
- Ponding water is an indicator of a failing drainage system due to clogged drains.
- Because of the moisture and water ponding, plant growth and discoloration may occur on the roof.
- Open seams and exposed areas of the roof and flashing mean the roof is past its prime and needs repair.

Notes

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Roofing Manuals

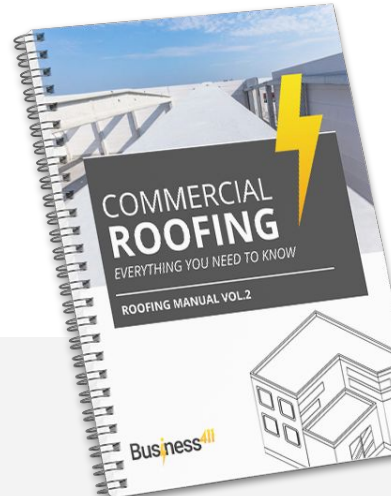
Our mission is to elevate everyone in the Roofing Industry through education. Below is our full catalog of Roofing Education content if you need to add anything else to your library for training!



Learn More



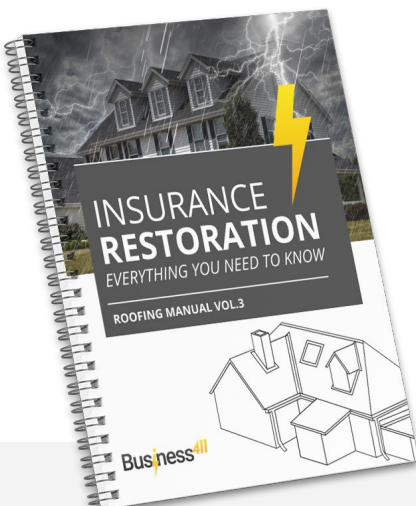
Our Residential Roofing guide is a great tool to train new staff, and have as a handy reference for roofing veterans. It educates them on all the basics of residential roofing like materials, process, services, and more.



Learn More



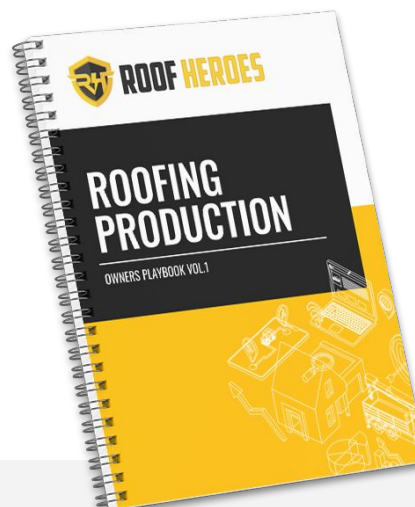
This manual gives your staff a great foundation on Commercial Roofing. We cover the differences of working with commercial clients, types of flat roofing system, services, and more.



Learn More



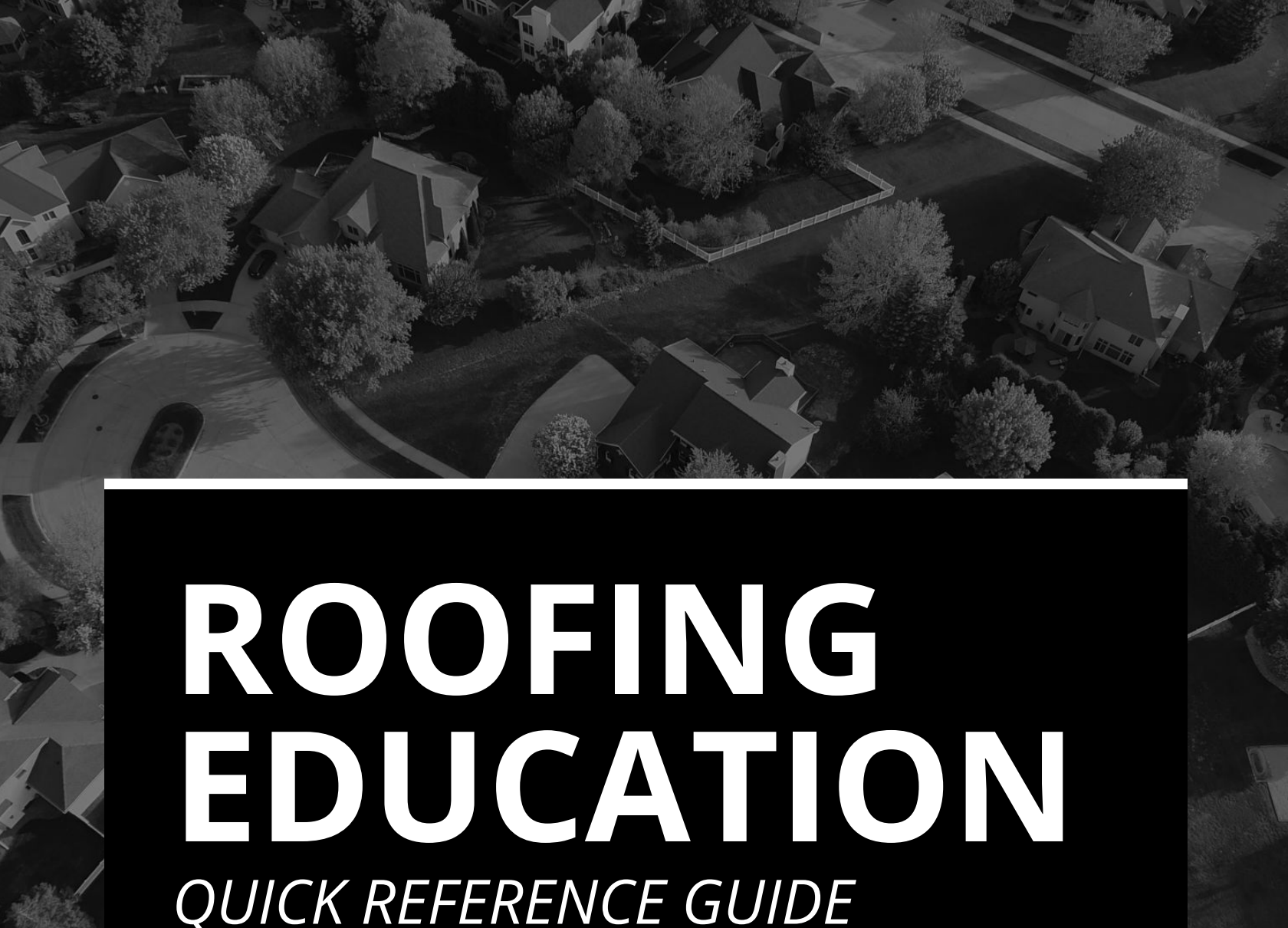
This guide is more than just a tool to train your team on what Insurance Restoration is. Not only will we cover Restoration basics, but also best practices to get claims approved, different strategies to working insurance jobs, and more.



Learn More



The Roofing Production guide is the ultimate training tool for Production Managers. We outline the overview of pre, during, and post production steps and communications between sales, office, production, crew, and the homeowner. We include different models depending on the size of your company!



ROOFING EDUCATION

QUICK REFERENCE GUIDE

ROOFING MANUAL

Thank You

Thank you for taking the time to better yourself and your company by reading this education manual. We created this manual to enrich the roofing industry and set a higher standard for ourselves in how we approach roofing and homeowners.

CREATED BY

Business⁴¹¹
Business Development Center