

Technical Brief: Roofing Done Right - Quality Shingles, Underlayment, and Why Plumbing Vents Go In Before the Roof

A builder's guide to what actually separates a roof that lasts 30 years from one that fails at year 8: shingle grade and wind rating, the secondary water barrier beneath the shingles, and the construction sequencing decision that determines whether every roof penetration is flashed into the roof system - or cut into it after the fact

Executive summary

A roof is not one product; it is a layered water-management system. The shingles are the first line of defense - the sacrificial, weather-facing layer that sheds the vast majority of water and takes the UV, wind, and impact abuse. The underlayment is the second line - a full-coverage backup membrane that catches wind-driven rain, ice damming, and any water that gets past a lifted or damaged shingle. And every penetration through the roof plane - most commonly plumbing vent stacks - is a potential leak point that must be flashed into that layered system in the right order. This brief explains, in plain terms, why shingle quality and underlayment quality both matter, how they work together, and why a competent builder runs plumbing vent stacks and other roof penetrations **before** the finished roofing goes down - not after. It closes with the field standard Ducere Construction Services applies on every roof it builds or repairs.

2 layers

a finished roof is a system: shingles (primary barrier) over underlayment (secondary barrier)

130 mph

wind rating territory for properly installed high-grade architectural shingles (ASTM D7158 Class H)

6 in.

minimum height a plumbing vent stack must extend above the roof surface (IRC P3103)

0

leaks tolerated - the reason sequencing penetrations before roofing is non-negotiable

1. The roof is a system, not a shingle

The most common homeowner mistake is evaluating a roof by the shingle alone. In reality, water protection comes from an assembly: the roof deck (sheathing), a leak-proof barrier at the deck level (underlayment, plus ice-and-water membrane in vulnerable areas), metal flashing at walls, chimneys, valleys, and penetrations, ridge/off-peak ventilation, and finally the shingle field. Each layer has a job, and the failure mode of the assembly is almost never "the shingle wore out" - it is water getting **around** a layer: at a valley, at a wall transition, at a chimney, at a vent stack, or under shingles that were lifted by wind the shingle was never rated to resist. A quality roof is bought twice: once in materials and once in sequencing. This brief covers both.

2. Quality shingles: what you are actually paying for

Not all asphalt shingles are the same product in different boxes. Differences in material grade translate directly into differences in wind resistance, seal-down performance, expected service life, and warranty strength.

2.1 Architectural (dimensional) shingles vs. three-tab. Three-tab shingles are a single-layer product: lighter, cheaper, shorter service life, and typically only warrantied in the 20-30 year range with lower wind ratings. Architectural shingles are a laminated, multi-layer product with a heavier mat and more asphalt: they resist wind lift and impact better, hold their seal strip longer, and carry stronger warranties. On any home Ducere builds, architectural is the baseline; three-tab is reserved for matching an existing roof plane on a repair, never as a cost-down choice on new work.

2.2 Wind rating and the seal strip. Asphalt shingles carry a wind-resistance classification tested under ASTM D3161 (Class A, D, or F by test speed) or ASTM D7158 (Class G or H, the modern standard). A Class H shingle (ASTM D7158) is tested to withstand 110-mph gusts at the shingle level, and with a full manufacturer-specified installation - correct nail count, placement, and nail type - a properly rated system is warranted for 130-mph gusts. Cheap shingles and careless nailing void that math. Once a shingle lifts and its seal strip breaks, the underlayment below is the only thing standing between wind-driven rain and your ceiling.

2.3 Algae resistance and the Georgia climate. Metro Atlanta's heat and humidity make the black streaking of airborne algae (*Gloeocapsa magma*) a cosmetic fact of life on cheap shingles. Quality shingles include algae-resistant copper granules that slow the black staining for years. It does not affect the roof's structure - but it is the difference between a roof that still looks new at year 10 and one that looks tired at year 4, and curb appeal matters at resale.

2.4 Warranty class tracks the mat. Manufacturer warranty tiers (30-year, "lifetime"/50-year, and premium lines) are roughly a proxy for mat weight and asphalt content. The same brand name appears on 30-year and premium shingles; the material inside is not the same. A builder who says "we use a name brand" is not answering the right question - the right question is **which product line, with what wind rating, installed to what fastening spec.**

BUILDER'S RULE OF THUMB

A roof is one of the few places in construction where spending up on materials reliably buys measurable life. Moving from a three-tab to a quality architectural shingle is typically a low-single-digit percentage of total project cost, but it changes the roof's wind rating class, its expected service life, and its appearance for the entire life of the home. Re-roofing the same house later costs multiples of that difference in materials alone.

3. Underlayment: the layer that saves the house when the shingles fail

Underlayment is the full-coverage membrane installed on the roof deck, directly beneath the shingles. Homeowners never see it, which is exactly why it gets value-engineered away. It should not be.

3.1 What it actually does. Underlayment is the roof's secondary water barrier. It sheds the water that gets past shingles in four predictable situations: (1) wind-driven rain under lifted shingles; (2) ice damming, where melting snow refreezes at the eave and backs water up under the shingle field; (3) the period between dry-in and shingle installation, when the roof must already keep the interior of the house dry; and (4) aging or storm-damaged shingles. It also separates the asphalt shingles from the wood deck, preventing resin interaction and improving fire performance.

3.2 Fifteen-pound felt vs. synthetic. Traditional asphalt-saturated felt (the "15-pound" and "30-pound" rolls) is the legacy option: inexpensive, proven, but it tears under foot traffic, absorbs water, wrinkles when wet, and degrades under prolonged UV exposure during construction. Synthetic underlayment - a polypropylene or polyester polymer sheet - is stronger (typically 6-8x the tear resistance), lighter, non-absorbing, and carries a longer exposed UV window, so the roof can stay safely dried-in while work above proceeds. Synthetic is the Ducere standard for the full roof field. The felt-vs-synthetic decision is one of the highest value-per-dollar upgrades in the entire roof assembly.

3.3 Ice-and-water membrane: the third layer where it counts. In vulnerable areas - valleys, eaves, rakes, around chimneys and skylights, at wall transitions, and at every penetration - a self-adhering modified-bitumen "ice and water shield" is installed beneath the field underlayment. It seals around the nails that penetrate it and around penetrations themselves, so water that reaches it stops there. On a Georgia roof this is not primarily an ice concern; it is a wind-driven-rain and valley-durability concern. Valleys concentrate water volume, velocity, and debris - they are the single most common leak origin on cheaply built roofs, and membrane in the valley is the cheapest insurance in the assembly.

3.4 The system principle. Code (IRC Section R905, including the asphalt-shingle provisions for underlayment, ice barriers, and flashing) sets a minimum, and manufacturer installation instructions are part of the code-required installation. A builder meeting only the code minimum has built a roof that is legal - not a roof that is good. Ducere's standard exceeds the minimum: synthetic underlayment over the full field, self-adhering membrane at eaves, valleys, and penetrations, and metal or manufacturer flashing integrated shingle-course by shingle-course at every vertical transition.

LAYER	JOB	DUCERE STANDARD
Shingle field	Primary weather surface: sheds water, resists wind/UV/impact; the visible, sacrificial layer	Quality architectural shingle with a wind rating appropriate to exposure, installed to full manufacturer fastening spec
Synthetic underlayment	Full-coverage secondary water barrier over the deck; keeps house dry during construction and catches water that gets past shingles	High-tear-strength synthetic over the entire roof field
Ice & water membrane	Self-sealing barrier at concentrated-risk areas; seals around fastener and penetration points	Self-adhering membrane at eaves, valleys, rakes, chimneys/skylights, wall transitions, and all penetrations
Flashing (penetrations, walls, drip edge)	Directs water out and over the shingle layer at every interruption of the roof plane	Vent boots and step flashing lapped into the shingle courses; drip edge at all eaves and rakes
Ventilation (ridge/soffit)	Moves moist air out of the attic; protects deck, underlayment adhesion, and shingle life from heat and condensation	Balanced soffit-to-ridge ventilation sized per code and shingle manufacturer requirements

4. Why plumbing vents get run before the roof goes on

Plumbing vent stacks - the pipes that let your plumbing system breathe - pass through the roof plane in almost every home. The International Residential Code requires each vent stack to terminate outdoors, extending at least 6 inches above the roof surface (IRC P3103), and every stack that penetrates the roof must be flashed so water cannot follow the pipe down into the building. This is precisely where sequencing matters, and where the "we'll cut it in later" approach quietly destroys roof quality.

4.1 The flashing depends on the layer order. A vent stack is waterproofed by a stack boot: a flexible neoprene gasket collar that grips the pipe, bonded to a square metal or polymer base. That base is supposed to be lapped **into** the roof system - under the shingle course above it, over the shingle course below it, seated on the underlayment, with the surrounding membrane layer wrapping it. That only works if the pipe is standing at its final height, plumb, before the underlayment and shingle courses are run. Then the roofer builds the assembly around the pipe in the correct lap order, and the boot becomes part of a continuous, layered water path.

4.2 What "cutting it in later" actually costs. When the vent stack is added after the roof is shingled, the roofer has to: cut a hole through finished shingles; remove surrounding courses to seat the boot base underneath; patch the underlayment around the penetration; reinstall the shingle courses he just removed; and attempt to re-seal the lifted seal strips (which frequently never reseal like factory seals). Every step of that rework substitutes field patching for factory-clean installation. The predictable results: boot bases sitting **on top of** shingles instead of lapped into them (water pools behind the base), patched underlayment that is no longer continuous, disturbed fasteners, and lifted shingles whose seal strips no longer hold. A large share of the "mystery roof leaks" that show up years later trace back to penetrations retro-cut into a finished roof - or, just as common, to old boots whose rubber collars have cracked from UV while nobody inspected them.

4.3 The same principle covers every penetration. Vent stacks are the most numerous, but the same sequencing rule governs the whole roof: mechanical penetrations (bath fan exhausts, range hood terminations), gas appliance vents, solar-panel standoffs, satellite mounts, and skylights should all be located, framed, and flashed into the layered system as the roof is built - not shot through a finished roof afterward. Each retro-cut is a hole through two water barriers that then depends on caulk to stay watertight. Caulk is a maintenance item, not a roofing system.

WHY BUILDERS SEQUENCE IT THIS WAY - IN ONE SENTENCE

It is cheaper and faster to flash a pipe into a roof that is being built than to open a finished roof to fit the pipe in - and the "cheap" version is the one that leaks.

4.4 What a plumber's vent-first work buys. Running the vent stack before roofing means the plumbing contractor sets the stack, brings it to final height and plumb, and the roof assembly is then built around it. It also means the vent boot collar size matches the pipe actually installed (3-inch and 4-inch stacks take different boots), the stack terminates far enough above the roof line to avoid snow/leaf burial, and the neoprene collar is fresh at installation rather than being a retrofit compromise. Done in this order, a vent penetration is one of the most reliable spots on the roof; done after, it is one of the most suspect.

5. The Ducere standard on every roof

Ducere Construction Services applies one field standard to every roof it builds, re-covers, or repairs, and to the trades working above and below it:

- 1. Deck first.** Verify sheathing condition and fastening; a new roof over a bad deck is money on top of a problem.
- 2. Dry-in complete before anything above proceeds.** Synthetic underlayment over the full field, self-adhering membrane at eaves, valleys, and penetrations, drip edge installed, and the roof left safely watertight.

3. Penetrations before shingles. Plumbing vent stacks set to final height; all roof penetrations located, cut, and flashed into the assembly as the roof goes down - never retro-cut through a finished roof.

4. Shingle quality, not brand minimums. Architectural-grade shingles selected for the exposure, fastened to the full manufacturer specification, with course-lapped flashing at every vertical transition.

5. Ventilation verified before close-in. Balanced intake and exhaust so the attic, deck, and underlayment perform for the life of the roof.

6. Documented. Like every Ducere scope, the roof is photographed and logged in the field documentation system - deck condition, dry-in, membrane at vulnerable areas, boot flashing at each penetration - so the layered system is verifiable years later, not just asserted.

6. Quick reference: frequently asked questions

QUESTION	ANSWER
Why does underlayment matter if the shingles are the waterproof layer?	Shingles are the primary barrier, but wind-driven rain, ice damming, and storm or age damage all let water past them. Underlayment is the full-coverage backup membrane that catches that water. Without it, the first lifted shingle is a ceiling stain.
Is synthetic underlayment really worth more than felt?	Yes. Synthetic is stronger (far higher tear resistance), does not absorb water, does not wrinkle or rot when left exposed during construction, and gives the roof a longer safe exposure window between dry-in and shingling. It is a small fraction of roof cost for a large gain in reliability.
What is ice-and-water shield for, in a state without much ice?	It is a self-sealing membrane for concentrated-risk areas: valleys, eaves, chimneys, skylights, wall transitions, and penetrations. In Georgia the driver is wind-driven rain and valley water volume, not ice. It seals around fasteners, which felt and field underlayment do not.
Are the expensive shingles actually better, or just branded?	Product line matters more than brand. Higher-tier architectural shingles carry heavier mats, higher wind ratings (look for ASTM D7158 Class H and warranted gust speeds), algae-resistant granules, and stronger warranties. The brand name alone tells you nothing about which of those you got.
Why run the plumbing vents before the roof is installed?	Because the vent boot that waterproofs the stack must lap INTO the roof layers - under the shingles above it, over the shingles below it, seated on the underlayment. That is only possible if the stack exists at final height before the roof is built. Cutting the stack in afterward means field-patching two water barriers and relying on resealed shingles - the classic origin of mystery leaks.
Does the vent height above the roof matter?	Yes. Code requires the vent stack to terminate at least 6 inches above the roof surface (IRC P3103). Too low, and debris, snow, or water at the roof line can affect the opening; the stack also needs to be clear of the roof's own drainage path.
What does Ducere actually install on a typical roof?	A quality architectural shingle over high-tear-strength synthetic underlayment on the full field, self-adhering membrane at eaves, valleys, and all penetrations, course-lapped metal flashing, drip edge at eaves and rakes, and every penetration - plumbing vents included - flashed into the assembly during installation, with the work photographed and logged.

Standards referenced: International Residential Code (IRC), Chapters 9 (roof assemblies, Section R905) and 25/P3003-3103 (plumbing vent terminals); ASTM D7158 and ASTM D3161 (asphalt shingle wind-resistance classification); ASTM D226 (asphalt-saturated organic felt underlayment); manufacturer installation instructions, which are part of a code-compliant installation. Specific product selections are made per project based on roof geometry, exposure, and the shingle manufacturer's requirements. Informational only - not legal or engineering advice. Confirm requirements applicable to your specific project with a licensed contractor or the authority having jurisdiction.