The Ridge Metal Roof Committee Recommendation

"…there remain problems at the basic level with the design, manufacture, installation, and durability of asphalt shingles. Assessments of asphalt shingle roofs … after hurricanes have revealed deficiencies in each of these areas." - T. Marshall et al (2010)

"…wind-induced tearing and blow-off of asphalt roofing shingles … are the most frequently observed forms of residential building damage in hurricanes." - C.R. Dixon et al (2013)

About the committee and our process:

We are neither roofers nor contractors and have undertaken this research solely for the benefit of the lives, pets and property of all homeowners at The Ridge. We are grateful for the opportunity to help our neighbors understand what we have discovered.

We have not, and will not accept any personal enrichment whatsoever from our work on this project and do not endorse any product, business or individual referenced in any of our communications.

What did we do? Aside from search engines, we spoke to roofers, metal roof suppliers, metal coating experts, an engineer, a roof consultant, Town of Jupiter Building Dept, and others with knowledge or experience with metal roofs. We met with the ACC and sought information from The River at The Bluffs ACC Chair.

We believe all provided information to be true and correct and welcome feedback on the contents of this document.

Respectfully Submitted,

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The Metal Roof Committee of The Ridge at the Bluffs HOA
March, 2020

Answers to some Frequently Asked Questions:

Metal roofs would be entirely optional, NOT mandatory.

The Association's attorney has advised that the Architectural Control Committee has the authority to approve aesthetic changes allowing metal roofs.

The Florida law (statute 163.04) that permits energy saving devices like solar panels and clotheslines, may give homeowners the right to install metal roofs, provided they are more energy saving than the currently approved asphalt shingles. As of March 6, 2020 the Association's attorney is researching this.

The River at the Bluffs expects to approve metal roofs later this month.

The Ridge Metal Roof Committee Recommendation

After extensive research, the Metal Roof Committee has concluded that metal roofs should be permitted (OPTIONAL) by the ACC without further delay, in accordance with the Metal Roof Standards developed by the Committee. Metal roofs* are safer and more energy efficient than our outdated asphalt shingle roofs. This conclusion is consistent with the October 2019 survey of Members that showed overwhelming support (74% 125 of 170) for metal roofs on our homes.**

Metal has much higher wind uplift performance, the industry measure of resistance to failure by lifting off the roof deck. Metal wind uplift resistance tests at -150 to -180 psf. Asphalt test results are elusive, but are rumored to be approximately -40 psf. In a recent industry study, GAF Timberline HD shingles failed at wind speeds of 60, 90 and 110 mph, and the test roofs were less than 1 year old. - H. E. Estes et al (2017)

An asphalt roof degrades rapidly and wind damage is often missed during visual inspection (C. B. Lopez, et al (2014)). A metal roof system does not degrade for decades and wind lifted panels or trim would be obvious.

Metal can survive weather events that would cause significant asphalt roof damage that would require repairs, re-roofing and interior restoration, possibly preventing a home from becoming uninhabitable for months or years.

Metal resists igniting a house fire from burning embers or ash landing on the roof.

Light color metal reflects a significant amount of solar energy whereas asphalt absorbs it and heats the house.

Metal does not require a ridge vent, which can allow water intrusion and interior damage during driven rain.

Metal can lower attic temperatures as much as 50ºF below asphalt, reducing home cooling costs.

Metal roof material is EPA EnergyStar rated. Asphalt shingles are not.

Metal likely contains recycled aluminum and is nearly 100% recyclable at end of life. Asphalt shingles have little or no recycling options.

Metal roofs look coastal and upscale while asphalt shingles convey a dated and out of place aesthetic. Asphalt shingles look low-budget because they are.

Light color metal roofs age gracefully, with subtle lightening of color. (also an advantage over dark metal colors which absorb more heat and fade more noticeably)

Metal roofs are growing in popularity, and will likely increase property values due to superior safety, efficiency, longevity and appearance. Asphalt shingles are to your roof what Formica counters are to your kitchen.

Asphalt may seem cheaper, until the first significant storm or the next asphalt re-roof…

Asphalt could be about 30% cheaper to install, but will likely need to be replaced twice before a metal roof needs replacement. A major storm or two over the life of a metal roof may save even more in repair costs.

Asphalt roofs are less costly to repair, however the same circumstances leading to an asphalt repair may not require any repair to metal. In such an example, restoration interior water damage may cost much more than the roof repair.

** All references to metal roofs are of the proposed type, material, style, and color.*
*** All references to asphalt shingle roofs refer to GAF Timberline in Shakewood color.*

Highlights of Metal vs Asphalt Roofs

A quick overview of standing seam metal roofs from thespruce.com.

We spoke to a coastal Jupiter homeowner who re-roofed with metal and they are delighted with the results: "My electric bill went down, my insurance premium went down, my home value went up, the roof is quieter and more pleasant in heavy rain, and my cell phone reception is unaffected."

Safety of life and property is paramount

Aluminum metal roofing is stronger and lighter and does not degrade, shed, tear and unseal like asphalt shingles, this creates a superior roof. A few interesting articles on the performance of metal roofs in wind events:

NY Times story on the house that survived Hurricane Michael. Photo below.

Habitat for Humanity houses survive Hurricane Michael. Local ABC coverage.

Metal roof protects a family during Hurricane Michael.

Financial Matters

Metal roofs cost more to install but generally cost less than asphalt shingles in the long run, due to windstorm resistance, energy savings, roof lifespan, home insurability, and home value.

Basic re-roof estimates for asphalt and metal were about $20,000 and $28,000 respectively. There are many variables and options that will increase the cost of either. A truss attachment upgrade during re-roofing is worth discussing with your engineer to see if it would improve wind uplift resistance. Roofers estimated this work at $5,000 to $6,000.

Energy Savings: Because metal roofs reflect so much solar energy, they reduce the amount of heat collected in the roof itself and in the attic. This saves on cooling costs and should extend the life of the A/C unit, especially for those homes where the A/C is still in the attic. In the Sunshine State, the higher the Solar Reflectivity Index (SRI) the better.

A UCF study concluded that "Selection of colors with higher solar reflectance will result in tangible cooling energy savings for customers. This is particularly true for roofing materials such as tile and metal, which are currently available with solar reflectances of 65%-75% range. The selection of reflective roofing systems represents one of the most significant energy-saving options available to homeowners."

Metal roofs can outlast two or three asphalt shingle roofs and can withstand severe weather, impact or fire that would damage asphalt, this can save both repair and replacement costs.

Metal roofs are known by buyers to be premium products and also help neighbors' values as neighborhood comps go up.

Metal roofs and home value. Another article on home resale value.

It may be difficult and/or expensive to insure asphalt roofs after 15+ years. Insuring older asphalt roofs.

Lifespan

Metal roofs can last 30 to 50 years or more, compared to 12 to 20 for asphalt. At least one metal roof manufacturer offers a full, non-prorated warranty on materials and labor for 35 years.

Sustainability Aside from the energy savings already mentioned…

New Roofs from Recycled Material: Much of aluminum used for new roofs contains recycled content.

Recyclable at end of life: Nearly 100% of an aluminum roof can be recycled.

Asphalt shingle roofs end up in landfills: Asphalt shingles put significant amounts of petroleum products and other toxins in landfills multiple times over the life of a single metal roof.

Links to Scientific Papers

Wind effects on asphalt shingles.
The influence of unsealing on the wind resistance of asphalt shingles.
Misconceptions of wind damage to asphalt shingles.
Evaluation of the effect of roofing systems on cooling demand in Florida.

Some images of metal roofs near The Ridge that look similar to the proposed metal roofs:

Here is a rendering to give some idea of what a metal roof might look like in The Ridge. Obviously a real metal roof will look better than this cut-and-paste.

Proposed
2/27/2020

The Ridge at The Bluffs HOA - Metal Roof Standards

Notice: Homeowner is solely responsible for ensuring that any roof replacement is ***properly engineered and installed*** including, but not limited to, building code compliance, permits, materials and installation, truss condition and wall attachment, sheathing, underlayment, water and/or fire barriers, installer compliance with manufacturer instructions, durability and/or performance.

Metal Roof Standards:

1. Panels shall be of coated (painted) ***aluminum*** with a minimum thickness of .032 inches.
2. Panel shall be painted with coating containing 70% KYNAR 500® PVDF resin.
3. Panel style shall be standing seam type.
4. Panel width shall be uniform, having a width of 14 to 18 inches.
5. Panels shall be of striated type profile to minimize unsightly "oil canning".
6. All panel fasteners (screws, bolts, clips) shall be of stainless steel and be concealed.
7. Metal roof panels shall not be installed over asphalt shingle roofing.
8. Panels shall be solid color, in white, off-white or silver. If the requested panel manufacturer's color is not on the color table below, a color sample must be provided.
9. Roof penetrations (e.g. exhaust vent caps, pipes, skylight trim) shall be painted to match roof panels using a product such as Sher-Cryl® for improved durability of appearance.
10. Drip edge, trim, caps, edges and the like, shall be the same material and color as roof panels.
11. Peel-and-stick waterproof membrane underlayment should be considered.
12. Approved colors:

Mfr / Brand	White	Off-White	Silver
ATAS	Ascot White	Bone White	Silversmith
Berridge	Natural White	Shasta White	
Drexel	Regal White	Bone White	Bright Silver
Englert	Bone White	Stone White	Preweathered Silver
Petersen / Pac-Clad	Bone White	Stone White	Silversmith
Ryerson / AlumaKlad	Snowdrift Regal White	Bone White Stone White	Bright Silver
Sheffield	Regal White	Solar White Stone White	Silver

Example of Proposed Colors for The Ridge

METAL ROOFING AND PERIMETER EDGE FINISHES

DrexelMetals
Roofing Systems + Custom Fabrication
www.drexelmetals.com

BONE WHITE SR.66

REGAL WHITE SR.65

SANDSTONE SR.49

DREXLUME™ *M*

ALMOND SR.54


SIERRA TAN SR.29


BUCKSKIN SR.38


CHAMPAGNE SR.35
premium


MEDIUM BRONZE SR.30


MANSARD BROWN SR.27


DARK BRONZE SR.29


METALLIC COPPER SR.42
premium


BURGUNDY SR.33


COLONIAL RED SR.33


TERRA COTTA SR.41


BRILLIANCE RED SR.41
premium


HARTFORD GREEN SR.27


FOREST GREEN SR.30


HEMLOCK SR.28


PREWEATHERED GALVALUME®
premium SR.35


PATINA GREEN SR.36


AGED COPPER SR.45


TEAL BLUE SR.29


BRIGHT SILVER SR.53
premium


DEEP BLUE SEA SR. 29


PACIFIC BLUE SR.29


SLATE BLUE SR.32


DOVE GRAY SR.31


MATTE BLACK SR.30


CHARCOAL GRAY SR.27

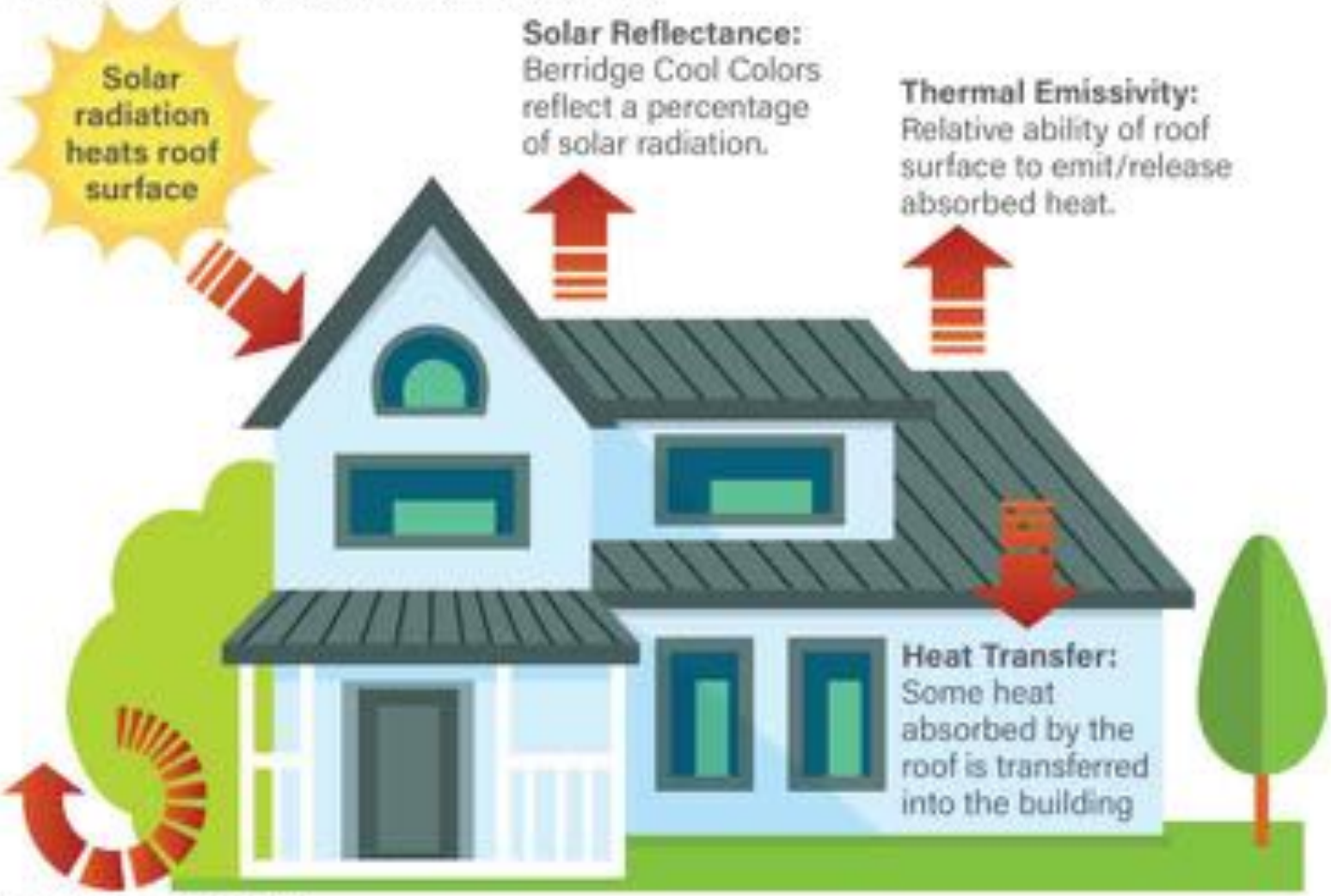

SLATE GRAY SR.37

M = MILL FINISH

SR = SOLAR REFLECTANCE

SOLAR REFLECTANCE INDEX (SRI):

Incorporates both solar reflectance and thermal emissivity in a single value. SRI measures the roof's ability to reject solar heat, defined such that a standard black (reflectance 0.05, emittance 0.90) is 0 and a standard white (reflectance 0.80, emittance 0.90) is 100.



Heat Island Effect:
Ambient temperature outside buildings is heated through convection and conduction contributing to the "urban heat island" effect which happens when metropolitan areas are significantly warmer then surrounding areas.

Why Cool Roofs Are Way Cool

A cool roof reflects and emits the sun's energy as light back to the sky instead of allowing it to enter the building below as heat. In many climate zones, a cool roof can substantially reduce the cooling load of the building, providing several direct benefits to the building owner and occupants:

- increased occupant comfort, especially during hot summer months
- reduced air conditioning use, resulting in energy savings typically of 10-30%[1], and
- decreased roof maintenance costs due to longer roof life.

In addition to these well known benefits to the building owner, cool roofs benefit the environment and public health in far more ways. As recognition of these benefits has become more widespread, cool roof requirements are appearing in building energy codes and green building programs across the nation.

Climate Change Mitigation

Cool roofs directly reduce green house gas emissions by conserving electricity for air conditioning therefore emitting less CO_2 from power plants. Cool roofs also cool the world independently of avoided carbon emissions, simply by reflecting the sun's energy as light back to the atmosphere, thereby mitigating global warming. A Lawrence Berkeley National Laboratory study found that world-wide reflective roofing will produce a global cooling effect equivalent to offsetting 24 gigatons of CO_2 over the lifetime of the roofs. This equates to $600 billion in savings from CO_2 emissions reduction.[2]

Urban Heat Island Mitigation

Cities can be 2° to 8°F warmer than surrounding areas due to dark materials, including roofs, which absorb the sun's light energy as heat during the day and release it at night as heat.[3] This phenomenon removes the opportunity for air to cool down at night and results in higher temperatures being maintained longer. By immediately reflecting solar radiation back into the atmosphere and reemitting some portion of it as infrared light, cool roofs result in cooler air temperatures for the surrounding urban environment during hot summer months.

Reduced Smog

Cool roofs, through mitigation of the urban heat island effect and reduction of ambient air temperatures, in turn improve air quality. Smog is created by photochemical reactions of air pollutants and these reactions increase at higher temperatures. Therefore, by reducing the air temperature, cool roofs decrease the rate of smog formation.

Public Health Benefits

Lower ambient air temperatures and the subsequent improved air quality also result in a reduction in heat-related and smog-related health issues, including heat stroke and asthma.

Peak Energy Savings and Grid Stability

Because cool roofs reduce air-conditioning use during the day's hottest periods, the associated energy savings occur when the demand for electricity is at its peak. Therefore, use of cool roofs reduces the stress on the energy grid during hot summer months and helps avoid shortages that can cause blackouts or brownouts. In addition, for building owners that pay for their energy based on the time of use, they save energy when it is at its most expensive – and hence, save more money!

Secondary Energy Benefits

Cool roofs directly reduce the air conditioning use for buildings by reducing heat gain in the building below, but they also indirectly reduce air conditioning use in urban areas by helping lower ambient air temperatures. Therefore, with cooler daytime temperatures, buildings and vehicles use less air conditioning and save additional energy. In turn, this results in a reduction in the CO_2 emissions from electricity generating power plants.

The Cool Roof Rating Council (CRRC) is a non-profit membership organization. Formed in 1998, the CRRC maintains a credible, third-party rating system to measure and label the radiative properties of roofing materials. Please visit us at www.coolroofs.org.

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[1] Energystar.gov
[1] Akbari, H. (2008). Global Cooling: Increasing Solar Reflectance of Urban Areas to Offset CO2. In press, *Climate Change*.
[3] Energystar.gov

FLORIDA SOLAR ENERGY CENTER®

March 11, 2020

TO WHOM IT MAY CONCERN:

This letter is in reference to your interest in installing a metal roof on your home to replace the current roof and your efforts to obtain approval from your homeowners' association to do so.

You and your HOA may be interested in the research that was conducted by researchers at the Florida Solar Energy Center on the influence of roof colors and materials on the energy consumption of a dwelling. Their conclusion was:

> "In summary, the selection of roof with high solar reflectance represents one of the most significant energy-saving options available to homeowners and home builders in hot climates. Further, the same materials strongly reduce the house peak cooling demand during utility coincident peak periods – a highly desirable attribute."

The energy saving potential of a reflective metal roof also gives it special consideration under Florida's Solar Rights Law. This Florida statute (Sec. 163.04, FS) forbids ordinances, deed restrictions, covenants, or similar binding agreements from prohibiting the use of solar equipment. Under the law, a homeowner may not be denied permission to install a solar collector, clothesline, or other energy device based on renewable resources by "any entity granted the power or right in any deed restriction, covenant or similar binding agreement to approve, forbid, control, or direct alteration of property..."

There has been some litigation with respect to the applicability of the Solar Rights Law. However, most disputes have been resolved through mediation or making the association aware of the statute. While most instances deal with "active" solar systems (solar thermal and photovoltaics systems), one case in point dealt with the installation of a garage door screen. The matter was settled during mediation in favor of the homeowner. It was agreed that the screen provided a means of cooling the residence by providing for natural ventilation, and as such constituted a "passive" solar measure. Passive solar measures in Florida work to prevent heat from entering or accumulating in a building, such as exterior shading devices, "cool" roofs (reflective roof materials) and the aforementioned screen.

In two other cases, homeowners prevailed against their associations when permission to install tubular skylights was denied. Tubular skylights are also considered passive solar devices, and the courts determined that they are protected by the statute, as they allow the use of the sun without heat gain to provide lighting, which would otherwise be provided with electricity.

As the FSEC research indicates, a reflective colored roof is considered a passive solar measure, in that it would prevent the infiltration of heat from the sun. (Please note that reflective roofing devices are eligible for federal tax credits and are also measures for which credit is available in the Florida Energy Code.) As such, a reflective colored roof should be protected under the statute. The denial by a homeowner association of a request to install this type of roof would constitute prohibiting the use of a passive solar energy device in violation of the statute. It should be noted that the prevailing party in litigation under 163.04 is entitled to recovery of legal fees and costs.

If I may be of further assistance, please advise.

Sincerely,

Colleen Kettles

Colleen Kettles, JD
Program Director
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321-638-1004

Section 163.04 Florida Statutes

Energy devices based on renewable resources.--

(1) Notwithstanding any provision of this chapter or other provision of general or special law, the adoption of an ordinance by a governing body, as those terms are defined in this chapter, which prohibits or has the effect of prohibiting the installation of solar collectors, clotheslines, or other energy devices based on renewable resources is expressly prohibited.

(2) A deed restriction, covenant, declaration, or similar binding agreement may not prohibit or have the effect of prohibiting solar collectors, clotheslines, or other energy devices based on renewable resources from being installed on buildings erected on the lots or parcels covered by the deed restriction, covenant, declaration, or binding agreement. A property owner may not be denied permission to install solar collectors or other energy devices by any entity granted the power or right in any deed restriction, covenant, or similar binding agreement to approve, forbid, control, or direct alteration of property with respect to residential dwellings and within the boundaries of a condominium unit. Such entity may determine the specific location where solar collectors may be installed on the roof within an orientation to the south or within 45° east or west of due south if such determination does not impair the effective operation of the solar collectors.

(3) In any litigation arising under the provisions of this section, the prevailing party shall be entitled to costs and reasonable attorney's fees.

(4) The legislative intent in enacting these provisions is to protect the public health, safety, and welfare by encouraging the development and use of renewable resources in order to conserve and protect the value of land, buildings, and resources by preventing the adoption of measures which will have the ultimate effect, however unintended, of driving the costs of owning and operating commercial or residential property beyond the capacity of private owners to maintain. This section shall not apply to patio railings in condominiums, cooperatives, or apartments.

Section 718.113, Florida Statutes

Maintenance; limitation upon improvement; display of flag; hurricane shutters.—

(6) Notwithstanding the provisions of this section or the governing documents of a condominium or a multicondominium association, the board of administration may, without any requirement for approval of the unit owners, install upon or within the common elements or association property solar collectors, clotheslines, or other energy-efficient devices based on renewable resources for the benefit of the unit owners.