HISTORIC DISTRICT HOMES - ROOF ANALYSIS
February 3, 2015

THE CITY OF PORTSMOUTH

WALLER TODD & SADLER ARCHITECTS

REPORT CONTENT

REPORT OBJECTIVES

The purpose of this report is to evaluate slate shingle roofing and alternates to slate shingle roofing systems in historic districts. This evaluation will consist of the following:

- Issues related to the repair and retention of slate shingle roofing versus its replacement.
- A comparison between slate roofing shingles and alternative materials. Comparative information shall include cost comparisons, life-cycle comparisons, and longevity/warranty comparisons.
- A review of how other localities address roof replacements in historic districts.
- Information about slate roofing shingles and materials replacement as found in National Park Service Preservation Briefs and the Secretary of the Interior's Standards for the Treatment of Historic Properties.
- A description of discussions and information gathered following meetings with property owners, the Historic Preservation Commission, and/or with City Council.

With the research gathered through this process and included herein, this report will examine the slate policy of the City of Portsmouth's Design Guidelines for Olde Towne, Park View, and Port Norfolk and make possible recommendations as to whether any modifications in the policy should be made.

SLATE SHINGLE ROOFING

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Slate shingles are made from natural slate rock. The history of slate roofing in Virginia goes back approximately two hundred years. At that time, early settlers in the James River basin of Buckingham County, VA, first used it to roof their homes.

Slate is an extremely durable, fire-resistant, energy-efficient, low-maintenance roofing material. Slate shingles are split, trimmed, and drilled to receive copper nails or wire ties. Slate is particularly suitable as a roofing material as it has an extremely low water absorption index of less than 0.4%, making the material waterproof.

Underlayment for slate roofing is typically 30 lb. felt over the roof deck. 45 lb. felt may be required for thick slate shingles. Exposure of shingles is relative to the slope of the roof (the lower the slope, the less the exposure).

Though slate itself will last virtually a lifetime, the life of a slate roof depends entirely on the fasteners and roof structure. Typically the fasteners will corrode first, compromising the roofing. In many cases, a properly installed slate shingle roof can last 80-100 years. Its low water absorption makes it very resistant to frost damage and breakage due to freezing.

Slate shingles can weigh from 1000 to 2000 lbs. per square of roof area. Heavier than normal roof framing is required.

Benefits: Beauty, durability, low-maintenance, very long-lasting. Maintains an historic aesthetic.

Drawbacks: Cost of labor and materials. Cost of increased roof structure due to weight of slate.

Types of Slate Shingle Roofs

Historically, there have been three types of slate roofing—**standard, textural, and graduated**—each providing a different architectural effect desired.

Standard-grade slate roofs, the most commonly utilized, are characterized by their uniform appearance. They are composed of slates approximately 3/16" thick, of consistent length and width, and having a relatively smooth surface. Thirty different standard sizes have customarily been available, ranging from 10" x 6" to 24" x 14". Standard-grade slates are typically laid to break joints and typically have square ends and uniform color and exposure. Patterned and multicolored roofs are created by laying standard slates of different colors and shapes on the roof in such a way as to create sunbursts, sawtooths and other varying geometric designs.

Textural slate roofs incorporate slates of different thicknesses and have a rougher texture than standard slates. Textural slate roofs are often associated with Tudor style buildings where slates of different colors are used to enhance the effect.

Graduated slates were given their name because they are laid according to thickness, size, and exposure, the thickest and largest slates being laid at the eaves and the thinnest and smallest at the ridge. Aesthetic architectural effects are achieved by blending sizes and colors. Graduated slate roofs have more frequently installed on large institutional and ecclesiastical structures. (*Source: Preservation Brief 29)*

When should slate be repaired?

Damaged slates (i.e. broken, cracked, and missing slates) should be repaired as soon as possible in order to prevent water damage to interior finishes, roof sheathing, and possible structural damage to framing members. An experienced, qualified slate roofer (traditionally referred to as a "slater") should be employed to properly perform the repairs. (*Source: Preservation Brief 29)*

What defines a failed roof?

A failed roof is one in which at least 20% or more of the slates on a roof are broken, cracked, missing, or significantly out of position. At this point, replacement can become more cost effective than repair. Slate shingles will, over a long period of time, begin to delaminate along the surface planes in which they were cleft, eventually leading to failure. Severely weathered slates give off a dull thud when tapped. If a roof is exhibiting signs of severe damage, the potential for further damage to the substrate and roof structure is considerably more likely and replacement of the roof shingles should be performed as soon as possible. (*Source: Preservation Brief 29)*

When should a slate roof be replaced?

As stated above, if 20% or more of the slates on a roof or roof slope are damaged (slates that are broken, cracked, missing, or out of position), it is usually less expensive to replace the roof than to perform individual repairs. This is particularly the case with older roofs nearing the end of their serviceable lives because often the most experienced slate roofer will damage additional slates while attempting repairs. Additionally the feasibility of salvaging of existing slates will depend on the age of the slate, its expected serviceable life, and the cause of deterioration. (*Source: Preservation Brief 29)*

Following is the Repair/Replacement Guideline included in Preservation Brief 29:

1. Consider the age and condition of the roof versus its expected serviceable life given the type of slate employed.
2. Calculate the number of damaged and missing slates. Is the number less than about 20%? Is the roof generally in good condition? If so, the roof should be evaluated for repair rather than replacement. Also, keep in mind that the older a roof becomes, the more maintenance it will likely require.
3. Determine if there are active leaks and what their source may be. Do not assume the slates are leaking. Gutters, valleys and flashings are more likely candidates. "False leaks" can be caused by moisture condensation in the attic due to improper ventilation.
4. Check the roof rafters and sheathing for moisture stains. Poke an awl into the wood to determine if it is rotted. Remember that very old, delaminating slates will hold moisture and cause adjacent wood members to deteriorate even if there are no apparent leaks.

5. Are many slates sliding out of position? If so, it may be that ferrous metal fasteners were used and that these are corroding, while the slates are still in good condition. Salvage the slates and reinstall them on the roof. If the slates have worn around the nail holes, it may be necessary to punch new holes before relaying them.
6. Consider the condition of the roof's flashings. Because slate is so durable, metal flashings often wear out before the slate does. Examine the flashings carefully. Even the smallest pinhole can permit large quantities of water to enter the building. Is the deterioration of the slate uniform? Often this is not the case. It may be that only one slope needs replacement and the other slopes can be repaired. In this way, the cost of replacement can be spread over many years.
7. Press down hard on the slates with your hand. Sound slates will be unaffected by the pressure. Deteriorated slates will feel brittle and will crack. Tap on slates that have fallen out or been removed. A full, deep sound indicates a slate in good condition, while a dull thud suggests a slate in poor condition.
8. Are new slates readily available? Even if replacement is determined to be necessary, the existing roof may have to be repaired to allow time for documentation and the ordering of appropriate replacement slates.

Example Images of Slate Shingle Roofs (Also see Photographic Documentation of Sample Properties in Appendix):

ALTERNATES TO SLATE SHINGLE ROOFING

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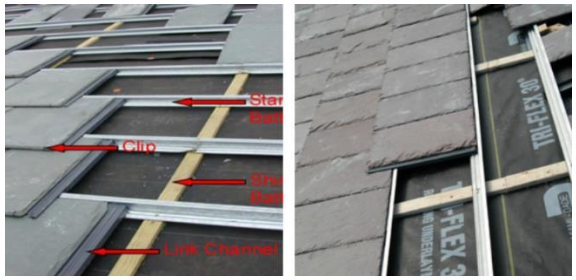
There are several alternative materials available that can be used to substitute for authentic slate roofing. The materials listed below are various alternates and are listed respectively from the closest matching to slate, to the least matching. They are as follows:

a) **Engineered/Manufactured Slate Roofing:** As slate can be expensive and can require a heavier structure to support it, some manufacturers have developed furring systems that utilize a lighter, thinner slate profile while utilizing authentic slate.

Benefits: Authentic slate with less weight than a conventionally laid slate roof. Ideal for retrofit applications.

Drawbacks: Roughly the same cost as conventionally laid slate once the cost of the furring system and labor are factored in. The value of an engineered slate roof system lies primarily in the savings that comes with the reduced roof structure.

Example Images of Engineered Slate Roof Shingles:



b) Synthetic Slate Shingles: Synthetic slate is made primarily of rubber (EPDM - Ethylene Propylene Diene Terpolymer) and plastics (TPO - Thermoplastic Polyolefin), installed in individual shingles, like slate, over an underlayment of either self-adhered product, synthetic roofing paper, or felt roofing paper.

Benefits: Less weight and cost than slate while having the appearance of slate.

Drawbacks: Some synthetic shingles have been known to have color-fading problems in the past. Most products are improved and many offer warranties for color-fade. Though the material is less expensive than slate, labor is more expensive than asphalt shingles.

Example Images of Synthetic Slate Roof Shingles:

c) **Composite Synthetic Slate Shingles ("Enviroslate"):** A rather new material on the market, Enviroslate is a composite synthetic slate product made of recycled plastics and cellulosic fibers manufactured by *Enviroshake Inc*. It is not susceptible to mold, mildew, fungus, rot or insect infestation. It should be noted that there is a property in Olde Towne (as seen in the photo image at bottom left) on which this product has recently been installed.

Benefits: Less weight and cost than slate. Material is less expensive than most other synthetic slates as the product is purchased direct from the company in lieu of through a supplier. Currently the company wants to control the quality of installation, so installers must be certified before they can purchase and install the product.

Drawbacks: The product is new on the market. With its newness comes inherent risks of the 'unknowns' of how the product will perform in its environment over a longer period of time. The company that makes the product has been producing a cedar alternative known as Enviroshake since 1998 with success.

Example Images of Composite Synthetic Slate Roof Shingles:

Example Images of Composite Synthetic Slate Roof Shingles:

d) **Premium-Grade Asphalt Shingles ('Camelot' or Slateline by GAF (General Aniline & Film) Materials Corporation, GrandManor of Carriage House by CertainTeed Corporation**): Asphalt-impregnated fiberglass shingles with granulated cap shingle. Thicker than an architectural grade shingle (425 lbs. per square) with a 'shadow line' aesthetic. Wind resistance rating of UL (Underwriter's Laboratory) certified to meet ASTM D3018 Type 1 and ASTM D3161, Class F, 110 mph wind resistance. Resistant to fungal coloration.

Benefits: More economical than slate or synthetic slate, and more aesthetically impactful than standard architectural-grade shingle. Thicker shingle provides more profile. Comes in a range of shapes (scalloped, etc.).

Drawbacks: More expensive than standard architectural-grade asphalt shingles. Nonetheless it does not look like slate. This product does differentiate itself from a standard asphalt shingle in scale and profile, but it does not have an historical appearance.

Example Images of Premium-Grade Asphalt Shingles:

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e) **Standard Architectural-Grade Asphalt Shingles (e.g. Timberline by GAF Materials Corporation):** Architectural-Grade Asphalt Shingles are asphalt-impregnated fiberglass shingles with granulated cap shingle. Though they do not have as much thickness and definition as Premium-Grade shingles, these shingles still provide a shadow-line and texture superior to the standard flat 3-tab shingles. Two types of base materials are used to make asphalt shingles: A formerly-living organic base and fiberglass base. Both types are made in a similar manner with asphalt or modified-asphalt applied to one or both sides of the asphalt-saturated base, covered with slate, schist, quartz, vitrified brick, stone, or ceramic granules and the back side treated with sand, talc or mica to prevent the shingles from sticking to each other before use. The top surface granules block ultra-violet light which causes the shingles to deteriorate provides some physical protection of the asphalt and gives the shingles their color. Some shingles have copper or other materials added to the surface to help prevent algae growth.

Benefits: Most economical of all the above options but still having a relatively appealing appearance due to the shadow-line texture and profile on the shingles in addition to improved fungus resistance.

Drawbacks: This shingle is the least look-alike to slate. Due to the widespread use of this product on properties throughout the United States, the installation of this type of shingle in 'historic districts' runs the risk of creating a neighborhood that does not differentiate itself from other modern-day neighborhoods.

Example Images of Architectural-Grade Asphalt Shingles:

SHINGLE ROOFING COMPARATIVE ANALYSIS

Shingle Roofing Cost Comparisons

Shingle Roofing Warranty Comparisons

Shingle Roofing Life Cycle Cost Analysis

Shingle Roofing Environmental Impacts

SHINGLE ROOFING COST COMPARISONS

Note: All costs are per roofing square. Roofing shingles are commonly sold by the square in the United States. One square is enough to cover 100 square feet of plain roof surface when laid with a standard head-lap of 3".

Typical **Natural Slate Roof Shingle Repair** Costs: (Trip charge, $50 per hour technician) = ~$250.00 - $1000.00 for 5 to 10 pieces of slate repair

Shingle Material	Removal*	Material & Installation**	Total Average***
Natural Slate	$60 - $85	$1,500 - $2,000	$1,830
a) Engineered Slate	$60 - $85	$1,500 - $2,000	$1,830
b) Synthetic Slate	$45 - $55	$1,100 - $1,400	$1,300
c) Composite Synthetic Slate	$40 - $50	$725 - $1,000	$910
d) Premium-Grade Asphalt	$35 - $45	$400 - $500	$490
e) Architectural-Grade Asphalt	$25 - $35	$250 - $350	$330

***** Removal costs include dump fees.

** Material & installation cost figures are provided in a range due to market factors that can affect costs. Cost range is also a result of factors such as pitch of roof, complexity of roof, quantity and complexity of dormers and flashings, and quantity of special shape shingles. (For example: a simple gable roof with no dormers would be on the low range, whereas a complex roof with a lot of dormers and special shape shingles would be on the upper end of the range).

*** The **Total Average** figure is an average of the sum total for both the removal cost and the material & installation cost.

Cost Sources: *Construction Means & Methods 2015*, Lakewood Builders, Bradford & Cameron Construction Services LLC, Allied Building Products, GAF Materials, Enviroshake Inc., CertainTeed Corporation

SHINGLE ROOFING WARRANTY COMPARISONS

Note: All costs are per roofing square. Roofing shingles are commonly sold by the square in the United States. One square is enough to cover 100 square feet of plain roof surface when laid with a standard head-lap of 3".

Typical **Natural Slate Roof Shingle Repair** Costs: (Trip charge, $50 per hour technician) = ~$250.00 - $1000.00 for 5 to 10 pieces of slate repair

Shingle Material	Coverage Period	Prorated	Transferable
Natural Slate	Lifetime	No	Yes
a) Engineered Slate	Limited Lifetime	No	Yes
b) Synthetic Slate			
"Ecostar"	50 years	Yes	No
"Da Vinci"	50 years	Yes	Yes, one allowed within 5 years
"Inspire"	50 years (100% coverage)	Yes	Yes
"Symphony" by CertainTeed	50 years, limited	Yes	Yes
c) Composite Synthetic Slate	50 years (100% coverage)	Yes	Yes
d) Premium-Grade Asphalt			
"Slateline" by GAF Corp.	50 years	No	Yes, one allowed
"GrandManor" by CertainTeed	50 years (100% coverage)	No	Yes, one allowed
e) Architectural-Grade Asphalt			
"Timberline" by GAF Corp.	50 years	No	Yes, one allowed
"Patriot" by CertainTeed	30 years	No	Yes, one allowed

SHINGLE ROOFING LIFE CYCLE COST ANALYSIS

(Based on 30 squares of roof (approximate average for a typical home))

Roofing Material	First Cost	25 years	50 years	75 years	Total Cost After 75 years
Natural Slate	$55,000	-	-	-	**$55,000**
a) Engineered Slate Roofing	$55,000	-	-	-	**$55,000***
b) Synthetic Slate	$39,000	-	$74,400	-	**$113,400****
c) Composite Synthetic Slate ("Enviroslate")	$27,300	-	$52,100	-	**$79,400****
d) Premium-Grade Asphalt (Slateline)	$14,700	$20,300	$28,040	$38,730	**$101,770*****
e) Architectural-Grade Asphalt (Timberline)	$9,900	$13,670	$18,840	$26,080	**$68,530*****

Notes:

1. Costs are based on average of range as provided in the "Cost Comparisons" page of this report.
2. A 3% factor of yearly inflation is assumed for material cost increases over time. Other market factors, such as the cost of petroleum, will also affect material costs but are unpredictable and are therefore not factored in for this study.
3. Costs are for roof and underlayment replacement only and do not include any potential repairs to the substrate or roof structure.

*Engineered slate roofing is relatively new to the industry. Life of furring system is unknown.
**Product is too new to be certain. As product is warranted for 50 years, a 50 year replacement has been assumed.
***It has been observed that most asphalt shingle roofs begin to wear out after about 25 years and are typically replaced by an Owner that does fails to utilize the warranty for a variety of reasons.

SHINGLE ROOFING ENVIRONMENTAL IMPACTS

Natural Slate

Being a natural stone product, natural slate shingles are the least impactful on the environment of the different options. Additionally, slate can be salvaged and reused or even crushed and utilized in other applications. It does not require an application of fungicidal or insecticidal contaminants. In fact, this natural slate, which requires only minimal processing, has the lowest embodied energy of all the roofing materials.

a) Engineered/Manufactured Slate

As the shingles themselves are natural slate, the same can be said about this product as above. They are thinner, using less raw slate per square. These products have a manufactured backing and/or clipping system, so there is additional manufacturing required and embodied energy over that of natural slate.

b) Synthetic Slate

Synthetic slates are typically made from a relatively high percentage of recycled materials. "Ecostar" brand shingles, for example, are made from 80% post-industrial recycled rubber and plastic. This is relatively typical for most brands of synthetic slate shingles. However there is a percentage of raw material that is not recycled, is petroleum-based, and is treated with fungicides and insecticides. Several synthetic roof slate tiles are ENERGY STAR rated.

c) Composite Synthetic Slate ("Enviroslate")

From an environmental standpoint, Enviroslate composite slate shingles are an improvement over other synthetic slates. They are composed of 95% recycled materials, consisting of plastics and wood fibers. They are, however, treated with fungicides and insecticides.

d/e) Premium-Grade Asphalt and Architectural-Grade (30-year) Asphalt

A 2007 study done for the United States Environmental Protection Agency (EPA) titled "Environmental Issues Associated with Asphalt Shingle Recycling" provides the following information:

- Approximately 11 million tons of asphalt shingle waste is generated each year in the United States.

- The most common disposal method for asphalt shingles in the US is landfilling. Waste asphalt shingles do, however, offer a strong potential for recovery and recycling with uses in hot mix asphalt (HMA), cold asphalt patching, and as a fuel in cement kilns.
- The main environmental concern in recycling asphalt shingles is the rare presence of asbestos in shingles manufactured before 1980. Asbestos was also used in some felt paper, roll roofing, roof paint, roof coating, caulking, and mastic.
- Asphalt naturally contains polycyclic aromatic hydrocarbons (PAHs) some of which are carcinogenic and may put recycling workers at risk. Leaching and airborne PAHs have remained below detectable levels in most testing.

HOW OTHER LOCALITIES HAVE ADDRESSED ROOF REPLACEMENTS IN HISTORIC DISTRICTS

HOW OTHER LOCALITIES HAVE ADDRESSED SLATE ROOF REPLACEMENTS IN HISTORIC DISTRICTS

Different localities hold different nuanced stances with regard to the replacement of slate roofs. However in all localities the general gradation of steps for replacement is similar (following the Secretary of Interior's Guidelines for Rehabilitation), as follows:

1. First and foremost, maintenance of the existing slate roofs is considered paramount in both preserving the existing material as well as protecting the house structure itself from rain and moisture damage.

2. Secondly, when a slate roof becomes damaged, the immediate response by the property owner should be to have a skilled slate roofer repair the damaged slate roof shingles. If replacement shingles are required in the repair, then matching slate shingles are to be provided.

3. Thirdly, if the slate roofing is so severely damaged and the underlying roof structure and interior elements of the house are incurring moisture damage due the poor condition of the roof, then complete roof replacement should be undertaken. The question at this point, is whether reinstallation of a 'new' slate roof, in-kind, is required or if an alternate roofing material is allowed.

4. In most every locality, if a roof is replaced exactly in-kind, then review/approval of such work is performed administratively. However if an alternative material or color is proposed, then the review of such work must go before the local Preservation Board.

Following step 3: this is where different localities have slightly different positions with regard to the strict adherence of requiring replacement 'in-kind'.

In the City of Newport News, within **Hilton Village Historic District**, strict adherence is required. Any roof that is currently slate (Vermont Slate in the case of Hilton Village), must be either repaired with Vermont Slate or replaced with Vermont Slate. Additions need not have roofs of slate however.

In the City of Newport News, within **North End – Huntington Heights Historic District**, a 'case-by-case' approach is considered. In two recent cases, the homeowners were allowed to replace the slate roof shingles with architectural-grade asphalt shingles. It should be noted, however, that this district does not have as much dominantly slate-shingled homes.

In the **City of Norfolk**, the Historic District Guidelines require 'in kind' replacement. However the Historic Preservation Commission has allowed, in certain cases, the replacement of slate with an engineered slate such as the system provided by the Greenstone Slate Company. Synthetic (rubber) slate has not been allowed.

In the **City of Suffolk**, slate roofs are not quite as prevalent as metal roofs and cedar shingle roofs. Repair/preservation is preferred. If repair is not feasible and a licensed contractor signs off on this fact, then replacement is allowed. Replacement in kind is encouraged, but replacement with an alternative product has been allowed on a 'case-by-case' basis.

In the **Town of Smithfield** if a change in roof material or color is requested, then the request must be heard by Smithfield's **Board of Historic and Architectural Review**. Typically the Board has been relatively accommodating with regard to roof replacement. In many cases, if a premium quality asphalt shingle is proposed as a replacement material and the color is in keeping with the color palette of the residence, the board has typically approved.

REPORT CONCLUSION

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The appearance of properties in historic districts is important to the property owners and to the overall community in which they are located. The charm and unique character of an historic district attracts new property owners into an area, increasing the tax base and improving the overall well-being of a community/city. It is important that materials employed on properties in historic districts protect the life of the properties, preserve the unique character of the historic nature of the district, and encourage the homeowners to continue ongoing maintenance and preservation of the historic character. There are modern materials that have improved performance, are easier to install, and are less costly than those of 100 years ago. These modern materials appear very similar to the historic materials and in many cases, only the most discerning and trained eyes can notice the difference. However there are also tried and true materials that have been known to perform well over many decades. Slate roofing is such a material when installed properly.

Many municipalities are challenged with balancing the important goal of maintaining the unique character of their historic districts while also attempting to keep the cost of property improvements at a feasible level for property owners within the historic districts and not discouraging new property owners from purchasing and maintaining the properties. A reasonable balance needs to be determined that, first and foremost, protects the properties from complete deterioration while also not allowing for any type of low-grade and unhistorical material be employed on properties, eventually diluting the charm of these communities.

When examining the City of Portsmouth's slate roofing policy for this historic districts of Olde Towne, Park View and Port Norfolk, it is useful to refer to other guidelines for historic standards and practices. **The Secretary of Interior's Standards for the Treatment of Historic Properties** states that, *"the historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided."* Furthermore, the National Park Service's **Preservation Brief 16** titled **The Use of Substitute Materials on Historic Building Exteriors** states that, *"when deteriorated, damaged, or lost features of a historic building need repair or replacement, it is almost always best to use historic materials. In limited circumstances substitute materials that imitate historic materials may be used if the appearance and properties of the historic materials can be matched closely and no damage to the remaining historic fabric will result."*
This brief provides four circumstances that warrant the consideration of substitute materials:

1. The unavailability of historic materials
2. The unavailability of skilled craftsmen
3. Inherent flaws in the original materials
4. Code-required changes (which in many cases can be extremely destructive of historic resources)

Preservation Brief 16 also states that, *"on the more philosophical level, the wholesale use of substitute materials can raise questions concerning the integrity of historic buildings largely comprised of new materials. In both cases the integrity of the historic resource can be destroyed. Some preservationists advocate that substitute materials should be avoided in all but the most limited cases. The fact is, however, that substitute materials are being used more frequently than ever in preservation projects, and in many cases with positive results. They can be*

cost-effective, can permit the accurate visual duplication of historic materials, and last a reasonable time. Growing evidence indicates that with proper planning, careful specifications and supervision, substitute materials can be used successfully in the process of restoring the visual appearance of historic resources."

The current policy of the City of Portsmouth's Historic Preservation Commission seems to align with the Secretary of Interior's Standards for the Treatment of Historic Properties and with much of the information found in the National Park Service Preservation Briefs in a number of ways. First, the Historic Preservation Commission's policy is to encourage the repair of existing slate shingles when at all possible. Secondly, when not possible to repair the existing slate or if the property is at risk of damage due to extensive roof damage, the replacement of the existing slate roof shingles with new slate roof shingles is acceptable. When a full scale replacement of slate roof shingles is proposed by a property owner, the Historic Preservation Commission has approved the use of substitute materials as long as the substitute material imitates the historic slate roofing and, *"matches the original roof covering in composition, size, shape, color, and texture."* The Historic Preservation's policy is that synthetic slate roofing and composite synthetic slate roofing adequately imitates the historic slate roofing but that fiberglass-asphalt shingles (whether premium or architectural grade) do not. Hence the Historic Preservation Commission has not approved the replacement of slate roof shingles with fiberglass-asphalt roofing shingles.

The guidelines outlined for roofs in Chapter IV of the City of Portsmouth's Design Guidelines are as follows:

1 Retain original or early roof materials, such as slate, wood shingle, or standing-seam metal whenever possible.
2 Preserve original roof shapes.
3 Retain architectural features including roof cresting, finials, dormers, cornices, exposed rafter tails, and chimneys.
4 Repair of roof materials and elements should be made in-kind with materials that duplicate the original materials.
5 Keep as much of the original material as possible. Consolidate original roof materials to the most visible areas and use replacement materials on areas not in view from public ways.
6 Replace roof coverings when necessary, using new material that matches the original roof covering in composition, size, shape, color, and texture.

Other localities in Hampton Roads have taken widely varying stances on historic slate roofing replacement. While some localities will not allow anything other than slate be used as a replacement, other localities will allow replacement of slate shingles with fiberglass-asphalt shingles as long as the shingle color palette is approved by the architectural review board. The City of Portsmouth's policy seems to take an approach somewhere in the middle of these two extremes and therefore seems to be a rather moderate and reasonable approach.

A concern or criticism about the City's policy that may be expressed by some property owners is in regard to the higher cost of maintenance of slate shingles and/or the replacement of slate shingles. This criticism is arguably unwarranted due to the fact that property owners are usually aware of the costs involved in owning historic properties. Furthermore most property owners own historic properties or live in historic districts with the understanding that they have a certain obligation to maintain the historic integrity of the neighborhood and with the expectation that their fellow property owners will do the same. Even so, due to the higher costs of 'in-kind' slate replacement the City's current policy is to

alleviate this hardship by allowing for the use of substitute imitation materials such as synthetic slate and synthetic composite slate. As mentioned above, this policy takes a balanced approach of providing an imitation material that will continue to preserve the historic resource while providing a less expensive alternative to slate.

For more information on roofing materials and other relative information regarding the treatment of historic properties, refer to National Park Service Preservation Briefs 4, 17, 19, 29 and 32 which are all available online.

APPENDIX:

Photographic Documentation of Sample Properties in **Olde Towne**

Photographic Documentation of Sample Properties in **Park View**

Photographic Documentation of Sample Properties in **Port Norfolk**

Portsmouth Historic District Guidelines – Roof Excerpts

The Secretary of the Interior's Standards for Preservation

The Secretary of the Interior's Standards for Rehabilitation

343 Court Street, Olde Towne

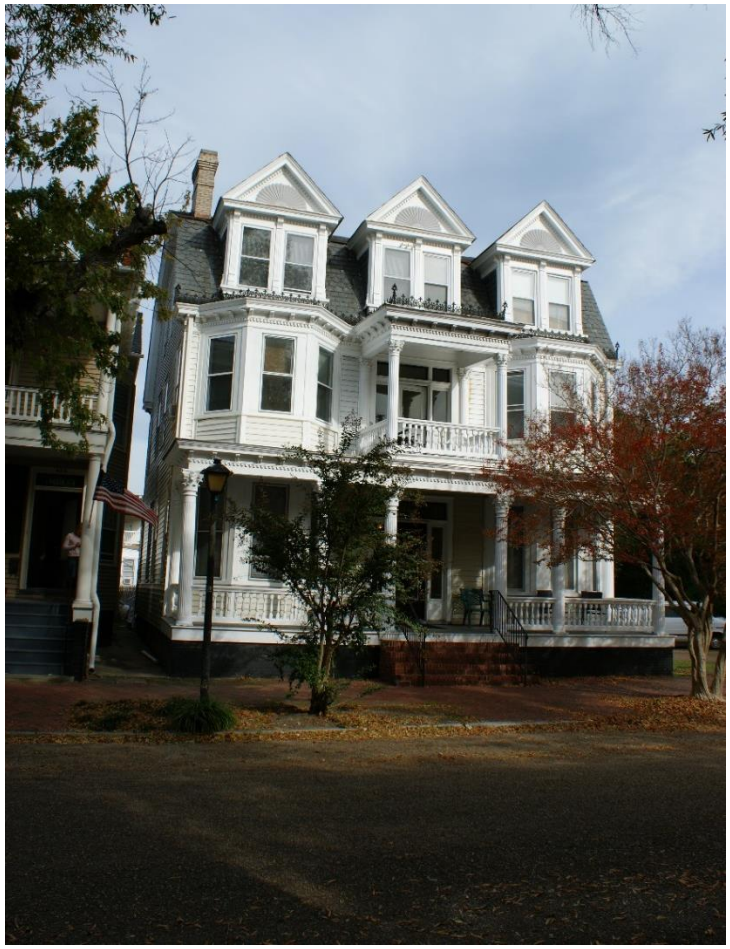
Mansard slate roof exhibits stains from adjacent painted surfaces. Flower pattern detail, composed of green and burgundy hexagonal slate, provides a charming feature aesthetic on front façade.

516 North Street, Olde Towne

Georgian home is complemented with slate roof. Some areas of slate shows signs of moderate damage and should be inspected by a qualified slate roofer.

532 Court Street, Olde Towne

Steeply pitched mansard roof expresses the slate roofing from the street view. Slate is also installed on the sidewalls of the dormers. Complicated geometries require the employment of a qualified slate roofer.



424 North Street, Olde Towne

Dormers dominate the roof façade of this residence. Subtle detailing of diamond shaped slate shingles adds elegance.

344 Court Street, Olde Towne

The Second Empire Style Building is capped off by a slate mansard. The steeply pitched, nearly vertical shingle exposure expresses the shingles more visibly from the street. Brown or red stains on the slate shingles are often caused by rust from wearing steel flashing or other on-roof metal products.

101 Linden Avenue, Park View

928 Ann Street, Park View

Slate shingles on both homes are in fair/good condition. Copper ridge flashings and valley flashings on 101 Linden are open and expressed to view.

1044 and 1048 Naval Avenue, Park View

The slate roof shingles are in fair condition on these homes. Copper ridge flashings and open valleys show the roof was properly flashed at the time of the roof installations.

100 Riverview Avenue, Park View

This slate shingle roof is in fair condition though there are some areas that appear to need repairs and should be inspected by a qualified slate roofer.

38 Riverview Avenue, Park View

Some portions of this slate roof is exhibiting signs of moderate damage and should be inspected.

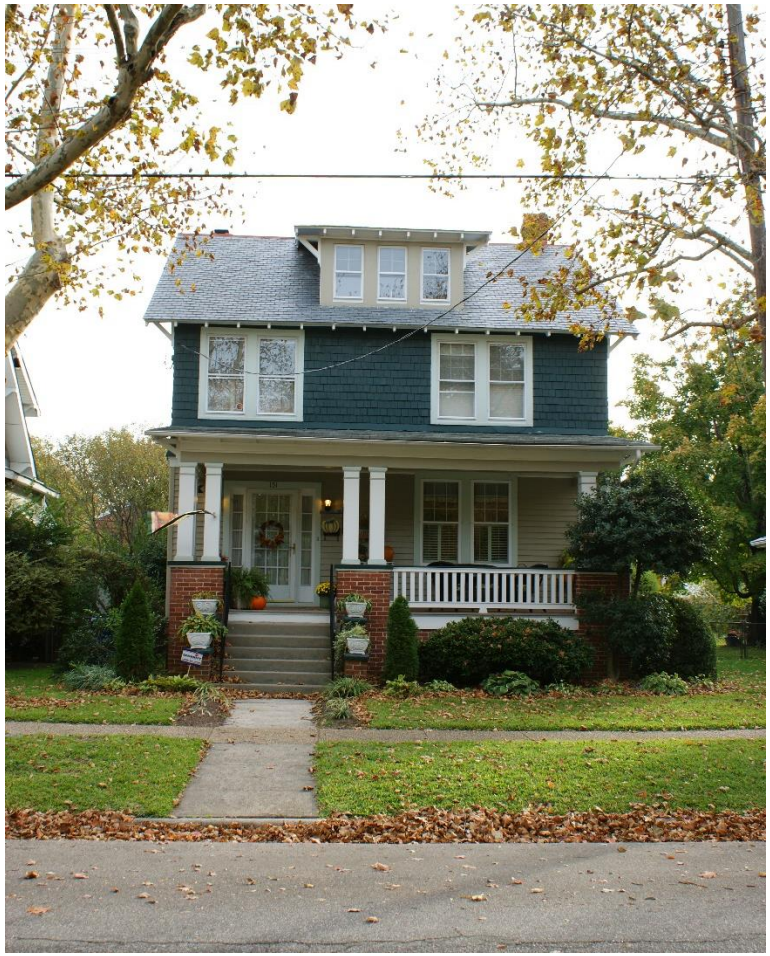
122 Riverview Avenue, Park View

This slate roof appears to be in good condition and is doing its job protecting the building from the elements while expressing the historic character of the neighborhood in a simple fashion.

2701 Bayview Boulevard, Port Norfolk

146 Florida Boulevard, Port Norfolk

Roof shingles at these homes are in fair/good condition. Metal ridge cap expresses a unique detail and enhances the character of the neighborhood. 146 Florida Boulevard has a middle row of diamond slates for added charm.



151 Florida Boulevard, Port Norfolk

This slate roof appears to be in good condition. The simple roof form decreases the labor costs incurred during repair or replacement.

158 Broad Street, Port Norfolk

Roof shingles are in fair/good condition. The steeply pitched tower element with metal cap detail and diamond shingle patterns enhances the character of the home and neighborhood.

Portsmouth Historic District Guidelines - Roof Excerpts

Olde Towne

Park View

Port Norfolk

C. Roofs

One of the most important elements of a structure, the roof serves as the "cover" to protect the building from the elements. Good roof maintenance is absolutely critical for the roof's preservation and for the preservation of the rest of the structure.

Roof shapes in the district vary with the architectural style of the structure. Streets in the oldest preserved sections of the district are characterized by gable roofs, often punctuated by gable roofed dormers. More rare are examples are the shed or flat roofs found on some Greek Revival examples and the Mansard roofs synonymous with the Second Empire style.

Yet other streets in the district are characterized by the steep cross-gabled roofs of the Queen Anne style. Many streetscape views combine a number of these roof lines indicative of the evolution of the district and contributing to its unique character.

Historic slate roofs, many laid in decorative patterns, cover a number of houses in the historic district. Other roofing materials include standing-seam metal and wood, metal, and asphalt shingles.

A variety of roof lines is depicted in this street view; from the relatively low pitched gable of basement house on the left, to the gambrel roof with its pedimented dormer, and the complex gables of the Queen Anne on the right.

An early gambrel roof is clad in two materials, an eighteenth-century, period-appropriate wood shingle and the later standing-seam. Metal roofs replaced wood roofs starting in the mid-nineteenth century to lower fire dangers, especially in urban areas.

Rectangular slates are punctuated with rows of curved, or fishscale shingles, to provide a decorative appearance on these wall dormers.

C. Roofs *continued*

In addition to original materials, a number of substitute roof materials may be approved for use in Olde Towne. These materials include metal, artificial slate, and architectural and asphalt shingles. Please consult the *Approval Matrix* in the *Appendix* of these guidelines for more information of the level of review necessary for each material.

Maintenance

1 Wood Shingles

The availability of wood made this roofing popular with the first settlers, and regional stylistic characteristics developed over time. Although there was a decline in the use of wood shingles in urban communities in the nineteenth century due to fire concerns, wood shingle roofs endured in rural areas. Replacement roof shingles should replicate the appearance of the early thin, usually oak shingles which were often fishscale or rectangular in shape. Modern cedar shingles are not an acceptable substitute.

In the early twentieth century, the Colonial Revival, Shingle and Bungalow styles were responsible for a resurgence in the popularity of this material. Longevity: 20-25 years.

2 Slate

Although its use in Virginia is documented as early as Jamestown, slate was not easily shipped and did not enjoy wide popularity until canals and railroads made its transport more economically feasible in the mid-nineteenth century. The most common roof slate found in Portsmouth is Buckingham slate.

a. Buckingham slate is from Buckingham County, Virginia, and is one of the hardest slates available. Its life expectancy is approximately 150 years.

b. Faux slate is manufactured from recycled plastic and rubber and costs as little as one-third the price of natural slate as well as weighing 50 percent less. When chosen carefully, these slates replicate the visual appearance of the historic material.

3 Concrete Shingles

Marketed as an alternative to slate and wood shingles for over a century, today's concrete shingles can be reinforced with cellulose that allows designs to simulate wood shingles. These concrete materials vary by product but generally have a life expectancy of 60 years. They can be more fire retardant than their wood counterparts and less expensive than slate.

4 Copper

Among the first uses of copper roofing was the New York City Hall in 1764. It did not see widespread popularity until the latter part of the nineteenth century when large quantities of the metal began to be mined in Michigan. Due to high cost, copper is more often used for flashing, gutters and downspouts. Since it does not need to be coated, copper weathers well and is easy to install. Longevity: 100 years.

5 Tin-plated iron

From its use at Thomas Jefferson's Monticello in 1800, this metal product was popular throughout the nineteenth century. As technology improved, the size of sheets grew from 10x14 inches in the 1830s to 20x28 inches in the 1870s.

6 Galvanized Metal

The process for galvanizing, or coating, iron or steel with zinc was patented in 1839, however, it was not until the early 20th century that the costs associated with its production were reduced to a sufficient level for it to become more economical than tin or terne.

To prevent galvanized metal from rusting, it is necessary to keep it well-painted. Use a primer and paint of good quality and that are specially formulated for use on galvanized metal to achieve the best results. Longevity: 50+ years.

7 Terne

The French word for dull, it was used to describe lead coated tin-plate patented in 1831. Less expensive than tin-plated iron, it became twice as popular by the end of the nineteenth century and was fashioned into shingles, sheets, 5V crimp, and standing-seam applications. A zinc-tin alloy on a steel substrate has now replaced the lead coated tinplate. The best maintenance is to make sure that any bare metal is primed with an iron-oxide primer and painted with a linseed-oil finish coat. Longevity: 30+ years.

The area between two levels of a projecting bay is clad in painted metal shingles, a product that gained popularity in the late nineteenth century and may be appropriate for certain Victorian styles.

8 Prepainted Terne

Modern terne must be painted to ensure its life expectancy. This product also comes prepainted from the factory in 5V crimp, shingles, and standing-seam metal reducing later maintenance issues. Certain suppliers offer a color palette that approximates a historic appearance rather than shiny coatings. This product, correctly installed, is virtually maintenance-free. Longevity: Finish is warranteed for 30 years.

When a uniform dark gray color is achieved, it is hard to tell upon first glance whether the roof covering is slate, artificial slate, or asphalt shingle.

C. Roofs *continued*

9 Terne-Coated Stainless

This relatively new material consists of stainless steel to which a zinc-tin alloy has been applied. This product does not need painting and can be worked in a manner to approximate historic standing-seam metal roof profiles. Keep the roof clear of debris and rinse annually. Longevity: 50-100 years.

10 Asphalt Shingles

First produced in 1903 as individual shingles cut from asphalt roll roofing, these shingles were given a stone surface. By 1906, the multi-tab strip shingle was being marketed.

By World War I, a number of factors, including its use of non-strategic materials, ease of transportation, fire retardant properties and lower costs, combined to increase its market share.

Ceramic granules have replaced the original crushed stone, and fiberglass mats have replaced felt underlayment to improve this product's durability.

Spring and Fall are good times to clear your asphalt roof of debris build-up and reattach loose shingles. Adhere loose shingles with a small amount of roof cement. Replace damaged shingles. Longevity: 15-50 years depending on quality/warranty.

11 Elastomeric Roof Coatings

These products can extend the life expectancy of a metal or built-up roof by reducing the roof's surface temperature and the harmful effects of solar radiation. These products should not be used to repair leaks. Leaks should be repaired using the original roofing material, roofing cement and reinforcing fabric. When used, an elastomeric coating should either match the paint color of the roof or a clear coating should be used with a matte finish. Longevity: 3-7 years.

Preservation Brief #04:
Roofing for Historic Buildings

www.nps.gov/history/hps/tps/briefs/brief04.htm

Inappropriate Treatments

1. Do not add dormers if not a part of the original design.
2. Do not add vents and skylights unless placed inconspicuously on the rear of buildings.
3. Do not replace a deteriorated historic roof with a material that does not have the same visual qualities as the original.

Guidelines

1. Retain original or early roof materials, such as slate, wood shingle, or standing-seam metal whenever possible.
2. Preserve original roof shapes.
3. Retain architectural features including roof cresting, finials, dormers, cornices, exposed rafter tails, and chimneys.
4. Repair of roof materials and elements should be made in-kind with materials that duplicate the original materials.
5. Keep as much of the original material as possible. Consolidate original roof materials to the most visible areas and use replacement materials on areas not in view from public ways.
6. Replace roof coverings when necessary, using new material that matches the original roof covering in composition, size, shape, color, and texture.

A rare example of a Mansard roof. This French roof style originated in an attempt to avoid paying taxes on the attic story of a residence.

Clad in patterned slate shingles, this gable roof is punctuated by a gabled dormer and conical capped tower with cutaway porch bay.

Preservation Brief #19:
The Repair and Replacement of Historic Wooden Shingle Roofs

http://www.nps.gov/hps/tps/briefs/brief19.htm

Preservation Brief #29:
The Repair, Replacement & Maintenance of Historic Slate Roofs

http://www.nps.gov/hps/tps/briefs/brief29.htm

A variety of gable roof types is depicted in this street view; from the more steeply pitched Colonial Revival to the low pitch of the Bungalow and the complex gables of the Queen Anne.

The repetitive front gable roofs of this row create a consistent rhythm on this block.

This is a rare example of a Mansard roof found in Park View. This French roof style originated in an attempt to avoid paying taxes on the attic story of a residence.

C. Roofs

One of the most important elements of a structure, the roof serves as the "cover" to protect the building from the elements. Good roof maintenance is absolutely critical for the roof's preservation and for the preservation of the rest of the structure.

Roof shapes in the district vary with the architectural style of the structure. While there are streets in the Park View Historic District that are characterized by the repetitive complex gable roofs of the vernacular Queen Anne style, there is nonetheless a great variety in roof lines throughout the district.

Hipped-roof American Foursquares, gambrel-roofed Colonial Revival houses, Mansard-roofed Second Empire buildings, the sweeping low gable of Bungalow roofs, and the turrets of Queen Anne towers all contribute to the rich variety that gives Park View its unique character.

Historic slate roofs, many laid in decorative patterns, cover a number of houses in the historic district. Other roofing materials include standing-seam metal, asphalt shingles, asbestos-cement shingles, and clay tiles.

This diamond pattern is indicative of an asbestos-cement shingle roof.

C. Roofs *continued*

A number of substitute roof materials may be approved for use in Park View. These materials include metal, artificial slate, and architectural and asphalt shingles. Please consult the Approval Matrix in the *Appendix* of these guidelines for more information of the level of review necessary for each material.

Maintenance

1 Asbestos-Cement Shingles

Invented in Europe in 1900, a U.S. patent for asbestos-cement shingles was issued in 1907. This material quickly became a popular and affordable substitute for slate, wood and clay tiles, and was used for new and existing construction projects. Often identified by their hexagonal, honeycomb or diamond pattern, these shingles were manufactured until the 1980s.

As they age, these shingles can become very brittle. A professional roofer who works with slate should be called for minor repairs. Replacement shingles suppliers may be found on the internet. Before beginning any project involving this material please refer to *Chapter II: Planning Your Preservation Project: Health and Safety Considerations* for more information. Longevity: 50-85 years.

Dark gray asphalt shingles may be an appropriate substitute for an asbestos-cement shingle roof that has reached the end of its life expectancy.

2 Asphalt Shingles

First produced in 1903 as individual shingles cut from asphalt roll roofing, these shingles were given a stone surface. By 1906, the multi-tab strip shingle was being marketed.

By World War I, a number of factors, including its use of non-strategic materials, ease of transportation, fire retardant properties and lower costs, combined to increase its market share.

Ceramic granules have replaced the original crushed stone, and fiberglass mats have replaced felt underlayment to improve this product's durability.

Spring and Fall are good times to clear your asphalt roof of debris build-up and reattach loose shingles. Adhere loose shingles with a small amount of roof cement. Replace damaged shingles. Longevity: 15-50 years depending on quality/warranty.

Rectangular slates are punctuated with rows of curved, or fishscale shingles, to provide a decorative appearance.

3 Slate

Although its use in Virginia is documented as early as Jamestown, slate was not easily shipped and did not enjoy wide popularity until canals and railroads made its transport more economically feasible in the mid-nineteenth century. The most common roof slate found in Portsmouth is Buckingham slate.

a. Buckingham slate is from Buckingham County, Virginia, and is one of the hardest slates available. Its life expectancy is approximately 150 years.

b. Faux slate is manufactured from recycled plastic and rubber and costs as little as one-third the price of natural slate as well as weighing 50 percent less. When chosen carefully, these slates replicate the visual appearance of the historic material.

Preservation Brief #29:
The Repair, Replacement & Maintenance of Historic Slate Roofs

http://www.nps.gov/hps/tps/briefs/brief29.htm

Preservation Brief #04:
Roofing for Historic Buildings

www.nps.gov/history/hps/tps/briefs/brief04.htm

C. Roofs *continued*

4 Galvanized Metal

The process for galvanizing, or coating, iron or steel with zinc was patented in 1839, however, it was not until the early 20th century that the costs associated with its production were reduced to a sufficient level for it to become more economical than tin or terne.

To prevent galvanized metal from rusting, it is necessary to keep it well-painted. Use a primer and paint of good quality and that are specially formulated for use on galvanized metal to achieve the best results. Longevity: 50+ years.

Standing-seam metal is an appropriate historic roofing material for many of Park View's historic structures.

Metal shingles were often used for the conical roofs of Queen Anne towers and continue to be available.

5 Terne

The French word for dull, it was used to describe lead coated tin-plate patented in 1831. Less expensive than tin-plated iron, it became twice as popular by the end of the nineteenth century and was fashioned into shingles, sheets, 5V crimp, and standing-seam applications. A zinc-tin alloy on a steel substrate has now replaced the lead-coated tinplate. The best maintenance is to make sure that any bare metal is primed with an iron-oxide primer and painted with a linseed-oil finish coat. Longevity: 30+ years.

6 Prepainted Terne

Modern terne must be painted to ensure its life expectancy. This product also comes prepainted from the factory in 5V crimp, shingles, and standing-seam metal reducing later maintenance issues. Certain suppliers offer a color palette that approximates a historic appearance rather than shiny coatings. This product, correctly installed, is virtually maintenance-free. Longevity: Finish is warranteed for 30 years.

7 Terne-Coated Stainless

This relatively new material consists of stainless steel to which a zinc-tin alloy has been applied. This product does not need painting and can be worked in a manner to approximate historic standing-seam metal roof profiles. Keep the roof clear of debris and rinse annually. Longevity: 50-100 years.

8 Elastomeric Roof Coatings

These products can extend the life expectancy of a metal or built-up roof by reducing the roof's surface temperature and the harmful effects of solar radiation. These products should not be used to repair leaks. Leaks should be repaired using the original roofing material, roofing cement and reinforcing fabric. When used, an elastomeric coating should either match the paint color of the roof or a clear coating should be used with a matte finish. Longevity: 3-7 years.

9 Clay Tile

Imported by early colonists and manufactured in this country by 1650, clay tile gained early favor as a fire-resistant roof covering. Tile use declined with the popularity of metal roofing products in the mid-19th century but regained favor with architects of the revival architectural styles by the close of the century. The Spanish, or barrel tile, as well as a number of shingle profiles were available through mechanized production methods by 1884.

Clay tiles may be installed with nails or wired to sheathing and can be mortared into place. Late nineteenth century promotional materials assert that the material may outlast the building it protects.

Look for broken or missing tiles and any evidence of leaks or water reaching structural roof elements. Confirm that all roof flashing is in good condition and identify the entry point of any moisture.

Tiles may be fragile and so it is best to hire a professional experienced in tile roof repair. The manufacturer's name should be imprinted on the inside of the tile and many of the companies that produced these tiles are still in business. Longevity: 100+ years.

Inappropriate Treatments

1. Do not add dormers if not a part of the original design.
2. Do not add vents and skylights unless placed inconspicuously on the rear of buildings.
3. Do not replace a deteriorated historic roof with a material that does not have the same visual qualities as the original.

Guidelines

1. Retain original or early roof materials, such as slate, clay tile, or standing-seam metal whenever possible.
2. Preserve original roof shapes.
3. Retain architectural features including roof cresting, finials, dormers, cornices, exposed rafter tails, and chimneys.
4. Repair of roof materials and elements should be made in-kind with materials that duplicate the original materials.
5. Keep as much of the original material as possible. Consolidate original roof materials to the most visible areas and use replacement materials on areas not in view from public ways.
6. Replace roof coverings when necessary, using new material that matches the original roof covering in composition, size, shape, color, and texture.

Preservation Brief #30:
The Preservation and Repair of Historic Clay Tile Roofs

www.nps.gov/history/hps/tps/briefs/brief30.htm

5V crimp is an economical metal roof material that may be used on accessory buildings such as sheds and garages.

The flat clay tile shown here is a rare example used as an alternative to slate.

Barrel-shaped clay tiles reflect a Mediterranean influence in several early twentieth century styles.

The varied roof lines on some of Port Norfolk's streets gives visual interest to the streetscape.

The repetition of end gables provides a rhythm of roof forms on other streets.

C. Roofs

One of the most important elements of a structure, the roof serves as the "cover" to protect the building from the elements. Good roof maintenance is absolutely critical for the roof's preservation and for the preservation of the rest of the structure.

Roof shapes in the district vary with the architectural style of the structure. While there are streets in the Port Norfolk Historic District that are characterized by the repetitive complex gable roofs of the vernacular Queen Anne style, there is nonetheless a great variety in roof lines throughout the district.

Hipped-roof American Foursquares, Gambrel-roofed Colonial Revival houses, the sweeping low gables and hips of Bungalow roofs, and the turrets of Queen Anne towers all contribute to the rich variety that gives Port Norfolk its unique character.

Historic slate roofs, many laid in decorative patterns, cover a number of houses in the historic district. Other roofing materials include standing-seam metal, asphalt shingles, and asbestos-cement shingles.

Asbestos-cement shingles were an economical and long-lasting roof material in the early twentieth century.

The uniform dark gray appearance of this asphalt-shingle covered roof helps this substitute roof material fit in with the Port Norfolk Historic District.

C. Roofs *continued*

A number of substitute roof materials may be approved for use in Port Norfolk. These materials include metal, artificial slate, architectural and asphalt shingles. Please consult the Approval Matrix in the *Appendix* of these guidelines for more information of the level of review necessary for each material.

Maintenance

1 Asbestos-Cement Shingles

Invented in Europe in 1900, a U.S. patent for asbestos-cement shingles was issued in 1907. This material quickly became a popular and affordable substitute for slate, wood and clay tiles, and was used for new and existing construction projects. Often identified by their hexagonal, honeycomb or diamond pattern, these shingles were manufactured until the 1980s.

As they age, these shingles can become very brittle. A professional roofer who works with slate should be called for minor repairs. Replacement shingles suppliers may be found on the internet. Before beginning any project involving this material please refer to *Chapter II: Planning Your Preservation Project: Health and Safety Considerations* for more information. Longevity: 50-85 years.

2 Asphalt Shingles

First produced in 1903 as individual shingles cut from asphalt roll roofing, these shingles were given a stone surface. By 1906, the multi-tab strip shingle was being marketed.

By World War I, a number of factors, including its use of non-strategic materials, ease of transportation, fire retardant properties and lower costs, combined to increase its market share.

Ceramic granules have replaced the original crushed stone, and fiberglass mats have replaced felt underlayment to improve this product's durability.

Spring and Fall are good times to clear your asphalt roof of debris build-up and reattach loose shingles. Adhere loose shingles with a small amount of roof cement. Replace damaged shingles. Longevity: 15-50 years depending on quality/warranty.

The house to the left retains its original slate shingles and the house to the right has an asphalt shingle replacement roof. The new shingles approximate the visual appearance of the historic material in color and pattern.

3 Slate

Although its use in Virginia is documented as early as Jamestown, slate was not easily shipped and did not enjoy wide popularity until canals and railroads made its transport more economically feasible in the mid-nineteenth century. The most common roof slate found in Portsmouth is Buckingham slate.

a. Buckingham slate is from Buckingham County, Virginia, and is one of the hardest slates available. Its life expectancy is approximately 150 years.

b. Faux slate is manufactured from recycled plastic and rubber and costs as little as one-third the price of natural slate as well as weighing 50 percent less. When chosen carefully, these slates replicate the visual appearance of the historic material.

Preservation Brief #29:
The Repair, Replacement & Maintenance of Historic Slate Roofs

http://www.nps.gov/hps/tps/briefs/brief29.htm

Preservation Brief #04:
Roofing for Historic Buildings

www.nps.gov/history/hps/tps/briefs/brief04.htm

4 Galvanized Metal

The process for galvanizing, or coating, iron or steel with zinc was patented in 1839, however, it was not until the early twentieth century that the costs associated with its production were reduced to a sufficient level for it to become more economical than tin or terne.

To prevent galvanized metal from rusting, it is necessary to keep it well-painted. Use a primer and paint of good quality and that are specially formulated for use on galvanized metal to achieve the best results. Longevity: 50+ years.

5 Terne

The French word for dull, it was used to describe lead coated tin-plate patented in 1831. Less expensive than tin-plated iron, it became twice as popular by the end of the nineteenth century and was fashioned into shingles, sheets, 5V crimp, and standing-seam applications. A zinc-tin alloy on a steel substrate has now replaced the lead-coated tinplate. The best maintenance is to make sure that any bare metal is primed with an iron-oxide primer and painted with a linseed-oil finish coat. Longevity: 30+ years.

6 Prepainted Terne

Modern terne must be painted to ensure its life expectancy. This product also comes prepainted from the factory in 5V crimp, shingles, and standing-seam metal reducing later maintenance issues. Certain suppliers offer a color palette that approximates a historic appearance rather than shiny coatings. This product, correctly installed, is virtually maintenance-free. Longevity: Finish is warranteed for 30 years.

Standing-seam metal is available in a variety of materials including galvanized, terne, pre-painted terne and terne-coated stainless-steel.

Metal roof cresting should be retained and maintained.

Patterned slate roofs are a character-defining feature in the Port Norfolk Historic District.

Overhanging eaves accented by brackets are a hallmark of the Craftsman style.

C. Roofs *continued*

7 Terne-Coated Stainless

This relatively new material consists of stainless steel to which a zinc-tin alloy has been applied. This product does not need painting and can be worked in a manner to approximate historic standing-seam metal roof profiles. Keep the roof clear of debris and rinse annually. Longevity: 50-100 years.

8 Elastomeric Roof Coatings

These products can extend the life expectancy of a metal or built-up roof by reducing the roof's surface temperature and the harmful effects of solar radiation. These products should not be used to repair leaks. Leaks should be repaired using the original roofing material, roofing cement and reinforcing fabric. When used, an elastomeric coating should either match the paint color of the roof or a clear coating should be used with a matte finish. Longevity: 3-7 years.

Inappropriate Treatments

1. Do not add dormers if not a part of the original design.
2. Do not add vents and skylights unless placed inconspicuously on the rear of buildings.
3. Do not replace a deteriorated historic roof with a material that does not have the same visual qualities as the original.

Guidelines

1. Retain original or early roof materials, such as slate, clay tile, or standing-seam metal whenever possible.
2. Preserve original roof shapes.
3. Retain architectural features including roof cresting, finials, dormers, cornices, exposed rafter tails, and chimneys.
4. Repair of roof materials and elements should be made in-kind with materials that duplicate the original materials.
5. Keep as much of the original material as possible. Consolidate original roof materials to the most visible areas and use replacement materials on areas not in view from public ways.
6. Replace roof coverings when necessary, using new material that matches the original roof covering in composition, size, shape, color, and texture.

The Secretary of the Interior's Standards for Preservation

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

1. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

2. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.

3. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

4. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

5. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color, and texture.

6. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

7. Archaeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

The Secretary of the Interior's Standards for Rehabilitation

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.