

BAR CASE# _____
(OFFICE USE ONLY)

ADDRESS OF PROJECT: 121 North Fairfax Street

DISTRICT: ☒ Old & Historic Alexandria ☐ Parker – Gray ☐ 100 Year Old Building

TAX MAP AND PARCEL: 075.01-02-02 ZONING: POS

APPLICATION FOR: (Please check all that apply)

☒ CERTIFICATE OF APPROPRIATENESS

☐ PERMIT TO MOVE, REMOVE, ENCAPSULATE OR DEMOLISH
(Required if more than 25 square feet of a structure is to be demolished/impacted)

☐ WAIVER OF VISION CLEARANCE REQUIREMENT and/or YARD REQUIREMENTS IN A VISION
CLEARANCE AREA (Section 7-802, Alexandria 1992 Zoning Ordinance)

☐ WAIVER OF ROOFTOP HVAC SCREENING REQUIREMENT
(Section 6-403(B)(3), Alexandria 1992 Zoning Ordinance)

Applicant: ☒ Property Owner ☐ Business (Please provide business name & contact person)

Name: Todd Hafner, Northern Virginia Regional Park Authority (NOVA Parks)

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ E-mail: _____

Authorized Agent (if applicable): ☐ Attorney ☒ Architect ☐ _____

Name: Michael Patrick Phone: _____

E-mail: _____

Legal Property Owner:

Name: Northern Virginia Regional Park Authority (NOVA Parks)

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ E-mail: _____

NATURE OF PROPOSED WORK: *Please check all that apply*

☐ NEW CONSTRUCTION

☒ EXTERIOR ALTERATION: *Please check all that apply.*

☐ awning

☐ fence, gate or garden wall

☐ HVAC equipment

☐ shutters

☐ doors

☐ windows

☐ siding

☐ shed

☐ lighting

☐ pergola/trellis

☐ painting unpainted masonry

☒ other Roof Replacement

☐ ADDITION

☐ DEMOLITION/ENCAPSULATION

☐ SIGNAGE

DESCRIPTION OF PROPOSED WORK: *Please describe the proposed work in detail (Additional pages may be attached).*

NOVA parks is proposing to replace the existing wood shingle roof on the Carlyle House with a standing seam metal roof.

Attached are the following documents:

1. Project Justification, Photos and Project Details

2. Manufacturer's Product Information Brochure - FreedomGray Metal Roofing

3. Draft Roof Replacement Construction Plans

SUBMITTAL REQUIREMENTS:

☐ Check this box if there is a homeowner's association for this property. If so, you must attach a copy of the letter approving the project.

Items listed below comprise the **minimum supporting materials** for BAR applications. Staff may request additional information during application review. Please refer to the relevant section of the *Design Guidelines* for further information on appropriate treatments.

Applicants must use the checklist below to ensure the application is complete. Include all information and material that are necessary to thoroughly describe the project. Incomplete applications will delay the docketing of the application for review. Pre-application meetings are required for all proposed additions. All applicants are encouraged to meet with staff prior to submission of a completed application.

Demolition/Encapsulation : *All applicants requesting 25 square feet or more of demolition/encapsulation must complete this section. Check N/A if an item in this section does not apply to your project.*

- N/A
- ☐ ☒ Survey plat showing the extent of the proposed demolition/encapsulation.
- ☐ ☒ Existing elevation drawings clearly showing all elements proposed for demolition/encapsulation.
- ☐ ☒ Clear and labeled photographs of all elevations of the building if the entire structure is proposed to be demolished.
- ☐ ☒ Description of the reason for demolition/encapsulation.
- ☐ ☒ Description of the alternatives to demolition/encapsulation and why such alternatives are not considered feasible.

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Additions & New Construction: Drawings must be to scale and should not exceed 11" x 17" unless approved by staff. Check N/A if an item in this section does not apply to your project.

- ☐ ☐ ^{N/A} Scaled survey plat showing dimensions of lot and location of existing building and other structures on the lot, location of proposed structure or addition, dimensions of existing structure(s), proposed addition or new construction, and all exterior, ground and roof mounted equipment.
- ☐ ☐ FAR & Open Space calculation form.
- ☐ ☐ Clear and labeled photographs of the site, surrounding properties and existing structures, if applicable.
- ☐ ☐ Existing elevations must be scaled and include dimensions.
- ☐ ☐ Proposed elevations must be scaled and include dimensions. Include the relationship to adjacent structures in plan and elevations.
- ☐ ☐ Materials and colors to be used must be specified and delineated on the drawings. Actual samples may be provided or required.
- ☐ ☐ Manufacturer's specifications for materials to include, but not limited to: roofing, siding, windows, doors, lighting, fencing, HVAC equipment and walls.
- ☐ ☐ For development site plan projects, a model showing mass relationships to adjacent properties and structures.

Signs & Awnings: One sign per building under one square foot does not require BAR approval unless illuminated. All other signs including window signs require BAR approval. Check N/A if an item in this section does not apply to your project.

- ☐ ☐ ^{N/A} Linear feet of building: Front: _____ Secondary front (if corner lot): _____.
- ☐ ☐ Square feet of existing signs to remain: _____.
- ☐ ☐ Photograph of building showing existing conditions.
- ☐ ☐ Dimensioned drawings of proposed sign identifying materials, color, lettering style and text.
- ☐ ☐ Location of sign (show exact location on building including the height above sidewalk).
- ☐ ☐ Means of attachment (drawing or manufacturer's cut sheet of bracket if applicable).
- ☐ ☐ Description of lighting (if applicable). Include manufacturer's cut sheet for any new lighting fixtures and information detailing how it will be attached to the building's facade.

Alterations: Check N/A if an item in this section does not apply to your project.

- ☒ ☐ ^{N/A} Clear and labeled photographs of the site, especially the area being impacted by the alterations, all sides of the building and any pertinent details.
- ☒ ☐ Manufacturer's specifications for materials to include, but not limited to: roofing, siding, windows, doors, lighting, fencing, HVAC equipment and walls.
- ☒ ☐ Drawings accurately representing the changes to the proposed structure, including materials and overall dimensions. Drawings must be to scale.
- ☐ ☒ An official survey plat showing the proposed locations of HVAC units, fences, and sheds.
- ☒ ☐ Historic elevations or photographs should accompany any request to return a structure to an earlier appearance.

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ALL APPLICATIONS: *Please read and check that you have read and understand the following items:*

- ☒ I understand that after reviewing the proposed alterations, BAR staff will invoice the appropriate filing fee in APEX. The application will not be processed until the fee is paid online.
- ☒ I understand the notice requirements and will return a copy of the three respective notice forms to BAR staff at least five days prior to the hearing. If I am unsure to whom I should send notice I will contact Planning and Zoning staff for assistance in identifying adjacent parcels.
- ☒ I, the applicant, or an authorized representative will be present at the public hearing.
- ☒ I understand that any revisions to this initial application submission (including applications deferred for restudy) must be accompanied by the BAR Supplemental form and revised materials.

The undersigned hereby attests that all of the information herein provided including the site plan, building elevations, prospective drawings of the project, and written descriptive information are true, correct and accurate. The undersigned further understands that, should such information be found incorrect, any action taken by the Board based on such information may be invalidated. The undersigned also hereby grants the City of Alexandria permission to post placard notice as required by Article XI, Division A, Section 11-301(B) of the 1992 Alexandria City Zoning Ordinance, on the property which is the subject of this application. The undersigned also hereby authorizes the City staff and members of the BAR to inspect this site as necessary in the course of research and evaluating the application. The applicant, if other than the property owner, also attests that he/she has obtained permission from the property owner to make this application.

APPLICANT OR AUTHORIZED AGENT:

Signature: Todd Hafner

Printed Name: Todd Hafner

Date: 6-12-26

OWNERSHIP AND DISCLOSURE STATEMENT

Use additional sheets if necessary

1. Applicant. State the name, address and percent of ownership of any person or entity owning an interest in the applicant, unless the entity is a corporation or partnership, in which case identify each owner of more than three percent. The term ownership interest shall include any legal or equitable interest held at the time of the application in the real property which is the subject of the application.

Name	Address	Percent of Ownership
1. Todd Hafner		0%
2. NOVA Parks		
3.		

2. Property. State the name, address and percent of ownership of any person or entity owning an interest in the property located at 121 North Fairfax Street (address), unless the entity is a corporation or partnership, in which case identify each owner of more than three percent. The term ownership interest shall include any legal or equitable interest held at the time of the application in the real property which is the subject of the application.

Name	Address	Percent of Ownership
1. NOVA Parks		100%
2.		
3.		

3. Business or Financial Relationships. Each person or entity listed above (1 and 2), with an ownership interest in the applicant or in the subject property is required to disclose any business or financial relationship, as defined by Section 11-350 of the Zoning Ordinance, existing at the time of this application, or within the 12-month period prior to the submission of this application with any member of the Alexandria City Council, Planning Commission, Board of Zoning Appeals or either Boards of Architectural Review.

Name of person or entity	Relationship as defined by Section 11-350 of the Zoning Ordinance	Member of the Approving Body (i.e. City Council, Planning Commission, etc.)
1.		
2.		
3.		

NOTE: Business or financial relationships of the type described in Sec. 11-350 that arise after the filing of this application and before each public hearing must be disclosed prior to the public hearings.

As the applicant or the applicant's authorized agent, I hereby attest to the best of my ability that the information provided above is true and correct.

6/18/2026

Date

Todd Hafner

Printed Name

Todd Hafner

Signature



OWNERSHIP AND DISCLOSURE STATEMENT ATTACHMENT

The Carlyle House property, located at 121 North Fairfax Street, is owned by the Northern Virginia Regional Park Authority (aka NOVA Parks).

NOVA Parks is a public body and there are no individuals that hold ownership of NOVA Parks or 121 North Fairfax Street.

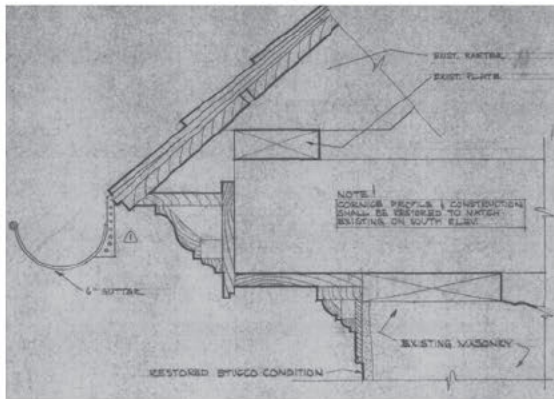
NOVA Parks' member jurisdictions include the counties of Arlington, Fairfax, and Loudoun, and the cities of Alexandria, Fairfax, and Falls Church. NOVA Parks is governed by a Board comprised of two members appointed from each member jurisdiction.

The current Board members of NOVA parks are as follows:

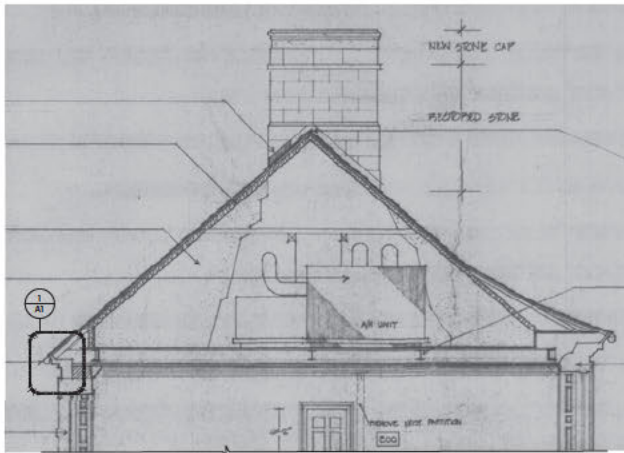
Arlington County	Paul Ferguson, Mike Nardolli
Fairfax County	Patricia Harrison, Stella Koch
Loudoun County	James Bonfils, Eric Woodall
City of Alexandria	Sean Kumar, Scott Price
City of Fairfax	Mark Chandler, Doug Stewart
City of Falls Church	Paul Baldino, Dave Gustafson

Todd Hafner is an employee of NOVA Parks and is authorized to act as the applicant for this BAR application.

THESE DRAWINGS ARE FROM THE SET DATED MAY 20, 1974.
GENERAL CONTRACTOR TO VERIFY EXISTING FIELD CONDITIONS.



1 EXISTING ROOF DETAIL @ WOOD CORNICE
A1
1/4" = 1'-0" WHEN PRINTED AT 22"x36"
1/8" = 1'-0" WHEN PRINTED AT 11"x17"



2 EXISTING ROOF SECTION
A1
SCALE 3" = 1'-0" WHEN PRINTED AT 22"x36"



3 PHOTO: EXISTING FRONT ELEVATION
A1
NO SCALE



4 PHOTO: EXISTING ATTIC FRAMING
A1
NO SCALE

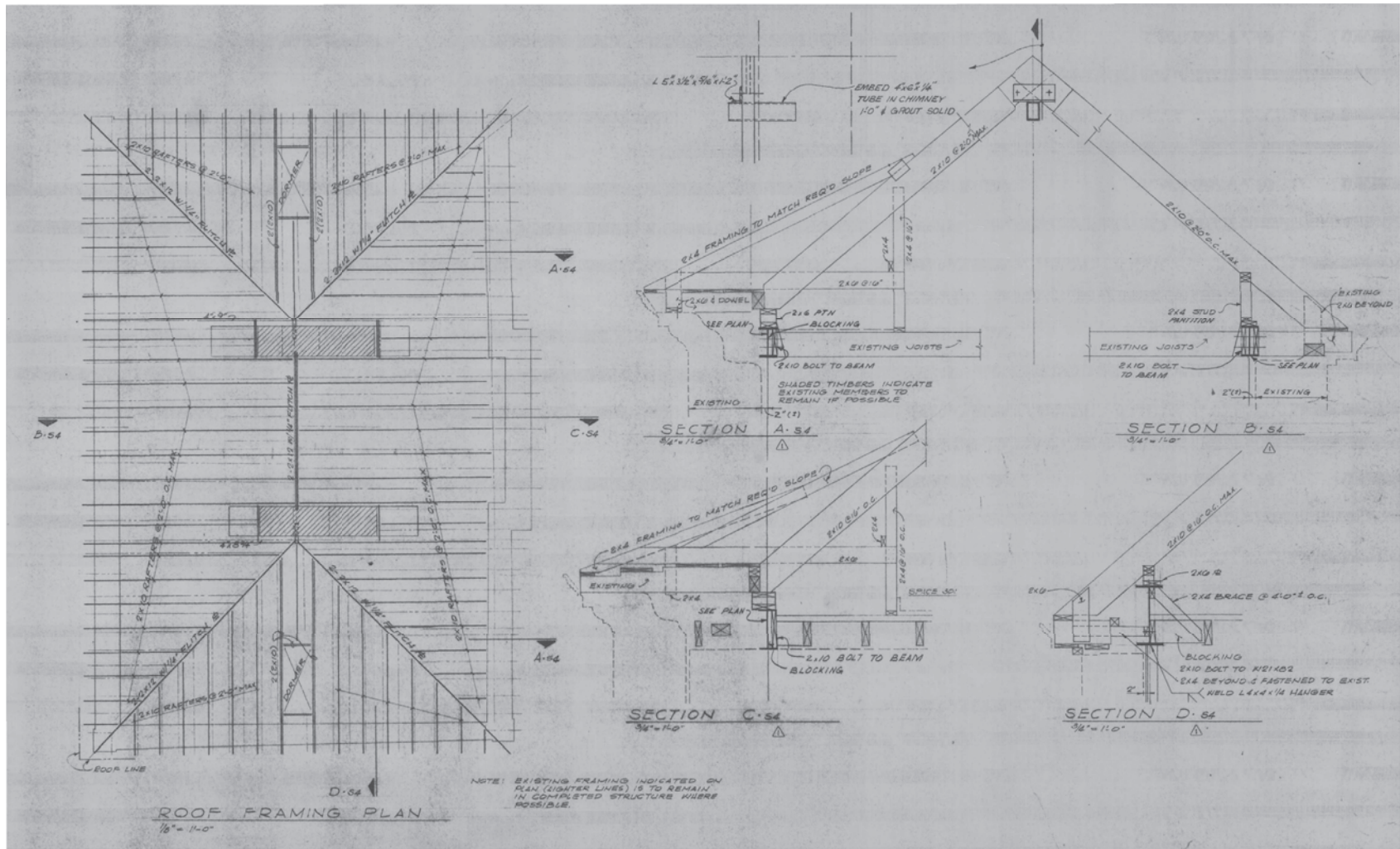


5 PHOTO: EXISTING ATTIC FRAMING
A1
NO SCALE



6 PHOTO: ROOF
A1
NO SCALE

DRAWING:	EXISTING CONDITIONS
ISSUED:	ROOFING DETAILS FOR USE
01/28/2008	ROOFING DETAILS FOR FINISH
02/12/2008	



1
A2 PHOTO: EXISTING ATTIC FRAMING PLAN & DETAILS
SCALE 1/8" = 1'-0"

THESE DRAWINGS ARE FROM THE SET DATED MAY 20, 1974.
GENERAL CONTRACTOR TO VERIFY EXISTING FIELD CONDITIONS.

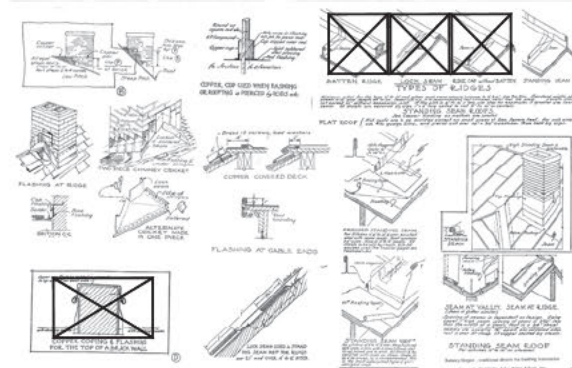
2407

BVA
Buckley & Associates, Inc.
1001 P. O. Box 70, Suite 1-2
Washington, D.C. 20007
Telephone: 202-337-7215
© 2014 Buckle Up Architects BVA

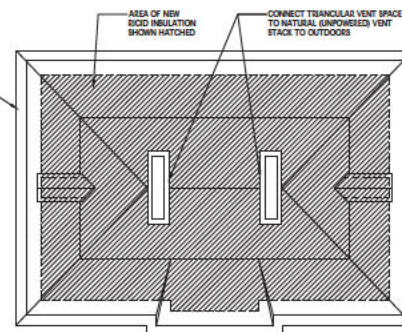
The
Carlyle House
121 N. Fairfax Street
Alexandria VA 22314

DRAWING:	EXISTING ROOFING DETAILS
INSIDE:	ROOFING DETAILS FOR JOE
01/28/2024	ROOFING DETAILS FOR JOE
02/13/2024	

A2



1 TYPICAL ROOFING DETAILS
A3 NOT TO SCALE



1 ROOF PLAN
A3 NOT TO SCALE

1
A3 PROPOSED METAL ROOF DETAIL
SCALE: 3" = 1'

Carlyle House Roof Replacement
Project Justification, Photos, and Project Details

NOVA Parks is submitting this application to the City of Alexandria BAR for the replacement of the existing wood shingle roof on the Carlyle House with a standing seam metal roof.

Below are photos of the Carlyle House roof noting the condition of the existing wood shingles.

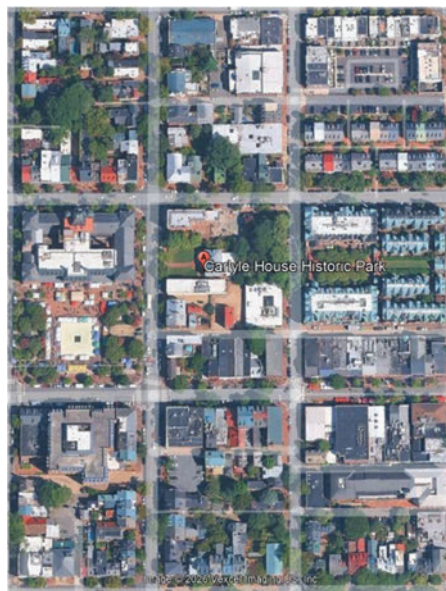




NOVA Parks' consultants have recommended that we replace the roof as soon as possible to avoid potential water damage to the building structure and its contents. The current roof was installed in 2007 and has lasted less than 20 years.

There are three primary reasons NOVA Parks is proposing to install a metal standing seam roof.

1. NOVA Parks wants to provide the best protection for the historic structure and its contents. We believe a properly installed metal roof will provide a superior and longer-lasting weather barrier. A metal roof will be less prone to storm damage and high winds that are common in the area. Furthermore, a metal roof will provide better fire protection for the wood framed building. There are many buildings close to the Carlyle House (see aerial below) which makes embers from nearby fires a serious concern.



2. NOVA Parks wants to provide a longer-lasting roof. Our research indicates that wood shingle roofs typically last no more than 20 years in the type of environment where the Carlyle House is located. Metal roofs can last 40-60+ years. In addition to the future replacement cost savings associated with a longer-lasting metal roof (our current estimated roof replacement cost is approximately \$250,000), there will be less disruption and potential damage to the house and museum over the long term. A roof replacement is a large undertaking that requires complete scaffolding of all sides of the house, demolition of the existing roof and flashings, and the stocking and installation of new roofing materials. It would be preferable not to have to replace the roof every 20 years.
3. NOVA Parks believes the appearance of a metal roof on the building would be attractive and historically accurate to the type of roof that would have been on the Carlyle House in the mid to late 1800s, and possibly earlier.

NOVA Parks Carlyle House Historic Site Manager, Rebecca Super, has completed research on the history of the Carlyle House roof and the following page includes excerpts from her work.

What roofing material did John Carlyle pick for his house of stone in 1752? Slate, wood shingles, metal, something else entirely. Unfortunately, we do not know. No bill of sale for roofing materials survives. Nor does the choice seem to have been an important enough detail to make it into a letter written to John's brother George. Nor did any other family or visitors write about that element of the house. What we do know is that the move in date for the Carlyle family to their new home was delayed a year due to a storm causing considerable damage to the home. The keystone is inscribed with the date 1752 – their original move it date. The family would not move in until August 1753.

Slate and thatch roofs would have been familiar to John Carlyle in his native England and Scotland, but they were not common choices in the Virginia colonies. The first metal roof in Virginia is generally attributed to Thomas Jefferson at his home at Monticello. Monticello is about 50 years younger than Carlyle House, but Jefferson saw metal roof construction while living in France so it is conceivable that Carlyle may have seen and known about metal roof construction as well.

What we do know is that after John Carlyle's lifetime the roof at Carlyle House changes many times. The Sandborn Map collection at the Library of Congress is a treasure trove of information. If we combine the Sandborn Map information with details about the weather in the area at the time we may be able to piece together a better picture.

The earliest Sandborn Map for 121 N. Fairfax Street is dated 1885. It indicates that Carlyle House is a three-story masonry building with a noncombustible roof.

1825 - A hurricane causes massive damage in Virginia

January 1827 - The "Great Fire of Alexandria." The fire began in the warehouses for the Green Furniture Factory (the soon to be owner of Carlyle House and builder of the Braddock Hotel). 53 buildings were destroyed just a few blocks from Carlyle House.

A hurricane hits the area in 1878 (Gale of '78) causes massive damage from wind and flooding.

1879 hailstorm breaks almost every window that faces West in the City of Alexandria.

These are just a few of the storms to hit the area in this time period.

The 1891 and 1896 maps indicated that the roof was noncombustible.

1896 Cedar Keys Hurricane damages 200 buildings in the City of Alexandria and causes approximately \$100,000 in damages (1896 money)

The 1902, 1907 and 1912 maps indicate that the roof has changed to a shake roof. The porch on the rear of the house which was added by James Green (in the 1850s) is listed as having a noncombustible roof.

Between the 1880s and 1906 Carlyle House ownership changes hands numerous times. Humphrey Wagar will buy the property in 1906 and hold on to it until 1941.

The 1921 maps indicate the roof has gone back to noncombustible.

The torpedo factory was built in 1918. They were actively handling and creating munitions in the space just behind Carlyle House until 1946.

The 1941 and 1959 maps both list a noncombustible roof. 1959 would be the last one currently online.

In 1941 Wagar sells the property and hotel to Schaffer. Schaffer will own the property until 1968.

Some key points from this research are as follows:

- The original Carlyle House roof was likely constructed of some type of wood shingle, but we do not know for certain the makeup of the original roof.
- There was a non-combustible roof on the house in 1885 (141 years ago) per the Sandborn maps and that was most likely a metal roof.
- There may have been a metal roof on the house in the early 1800's, but we do not have sufficient data to confirm the roof type during this time period.
- During the history of the Carlyle House, the roof has changed several times between metal and wood.

This photo below is from the early 1900's showing what appears to be a metal standing seam roof on the house.



There are many examples of metal roofs on historic buildings in Alexandria. In 2022, the City of Alexandria replaced a portion of the roof on the Dick-Murray-Fawcett house that was originally constructed in 1797. Below is a photo of the new standing seam roof on the Dick-Murray-Fawcett house. NOVA Park's intent would be to construct a similar roof on the Carlyle House but without the ridge cap that would not have been authentic to the time period. To address moisture and air movement issues that may arise, in lieu of a ridge vent cap, the design includes a strategy to capture and ventilate air up through vents to be installed in the chimney voids to exit passively above the roof.



Based upon the reasoning noted above and the roofing history of the Carlyle House, NOVA Parks believes it is appropriate to install a standing seam metal roof that would be historically accurate to the roof type and design that existed on the house in the 1800's.

PROJECT DETAILS

NOVA Parks proposes installing FreedomGray T-Z Alloy Coated Copper metal roofing, manufactured by Revere Copper Products. Attached is the FreedomGray Roofing manufacturer's product information brochure. Also attached are draft roof replacement construction plans prepared by NOVA Parks architect, BarnesVanze Architects (BVA).

FreedomGray is architectural sheet copper coated both sides with a tin/zinc alloy. The roofing material is supplied with a micro-embossed surface. When exposed to the atmosphere, the T-Z Alloy forms a natural oxide film. FreedomGray weathers to a slate gray color.

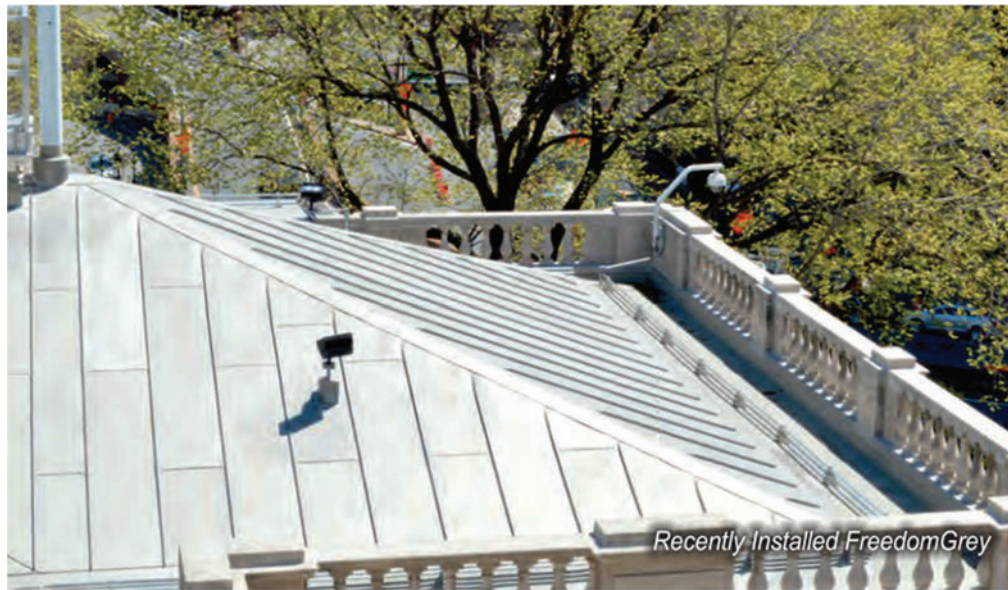
FreedomGray is a popular material for historic building restorations because it provides the traditional workability and longevity of copper, but naturally weathers to an aesthetically pleasing matte, slate-gray finish. It closely mimics the look of aged tin, lead, and dark slate roofs.

Historically, lead-coated copper was the standard for high-end historic buildings. Because lead raises environmental and health concerns, FreedomGray serves as a virtually identical aesthetic replacement without

the toxicity. Uncoated copper eventually develops a green patina. FreedomGray's tin-zinc coating prevents the copper underneath from oxidizing, preserving the clean gray aesthetic.

FreedomGray provides exceptional workability. Unlike pure zinc, which is brittle in cold weather and requires complex ventilated installation, FreedomGray can be bent, folded, and seamed with the same ease as traditional copper.

Below are some photos of FreedomGray roof installations.





To more closely resemble the type of metal roofing used in the 1800's, NOVA Parks intends to do the following:

- Install 20-ounce FreedomGray with a thickness of .027 inches.
- Space the standing seams at 17 inches on center.
- Hand crimp the seams and roll them as they near the peak of the roof.
- Install a hand crimped seam along ridge lines in lieu of a ridge cap.

Below are photos of a roof recently completed by BVA that resembles the proposed Carlyle House roof. It has hand crimped and rolled standing seams and no ridge cap. Note that the roofing material in this photo is not FreedomGray but is provided to show the metal roof installation techniques.





Attached are draft construction plans by BVA including the roofing design elements noted above. The proposed metal roof will also have snow/ice guards for public safety.

As indicated in the plans, NOVA Parks intends to replace the wood lath underlayment with $\frac{3}{4}$ inch plywood. There will also be a drainage layer and a waterproof underlayment under the metal roofing. The proposed metal roofing system will provide a stronger, longer lasting, and more weather resistant roof than the current system consisting only of wood shingles on lath.

END OF DOCUMENT



COMMONWEALTH of VIRGINIA

Department of Historic Resources

David L. Bulova
Secretary of Natural and
Historic Resources

Roger W. Kirchen
Director
www.dhr.virginia.gov

July 23, 2026

Todd Hafner, Sr. Project Manager
NOVA Parks
[REDACTED]
[REDACTED]

Re: Roof Replacement
Carlyle House, 121 N. Fairfax Street, City of Alexandria
DHR Easement File No. 100-0010_ep

Dear Todd ~

Thank you for submitting a project review request for the proposed replacement of the roof at the Carlyle House to the Department of Historic Resources (DHR). This information was submitted electronically on July 4, 2026. As you are aware, the Virginia Board of Historic Resources (VBHR) holds an historic preservation easement on the property, which requires prior review and approval by DHR of any alterations, additions or improvements to the property.

The request describes the proposed replacement of the existing wood shingle roof with one of standing seam metal. The building's roof structure has evolved throughout its existence and Sandborn maps indicate the roofing material was alternately non-combustible and combustible over the years; the form of the roof structure has also evolved. A historic photograph illustrating the building with this roof form sheathed in standing seam metal was included in the submission to further substantiate the requested change in material.

As proposed, the material will be 20 oz. FreedomGray Metal Roofing with seams spaced at 17 inches on center. The seams will be hand-crimped and rolled near the peak where a hand-crimped seam will run along the ridge lines in lieu of a ridge cap. The wood lath underlayment will be replaced with 3/4" plywood and a waterproof layer installed. The existing conditions and proposed modifications are illustrated on architectural drawings (BarnesVanze Architects Inc, dated 02-13-2026) included in the submission.

Following careful review, this proposal appears consistent with the provisions of the easement and the Secretary of the Interior's *Standards for Rehabilitation* and is approved. This approval is valid for one year from the date of this letter. Please contact our office if the proposal changes or if the work cannot be completed within one year. Thank you for your stewardship of this historic property.

Western Region Office
962 Kime Lane
Salem, VA 24153
[REDACTED]
[REDACTED]

Northern Region Office
5357 Main Street
PO Box 519
Stephens City, VA 22655
[REDACTED]
[REDACTED]

Eastern Region Office
2801 Kensington Avenue
Richmond, VA 23221
[REDACTED]
[REDACTED]

Sincerely,


Megan Melinat

Director, Preservation Incentives Division

C: Elizabeth Lipford, Easement Stewardship Specialist, DHR
Brad McDonald, Easement Stewardship Coordinator, DHR

Western Region Office
962 Kime Lane
Salem, VA 24153



Northern Region Office
5357 Main Street
PO Box 519
Stephens City, VA 22655

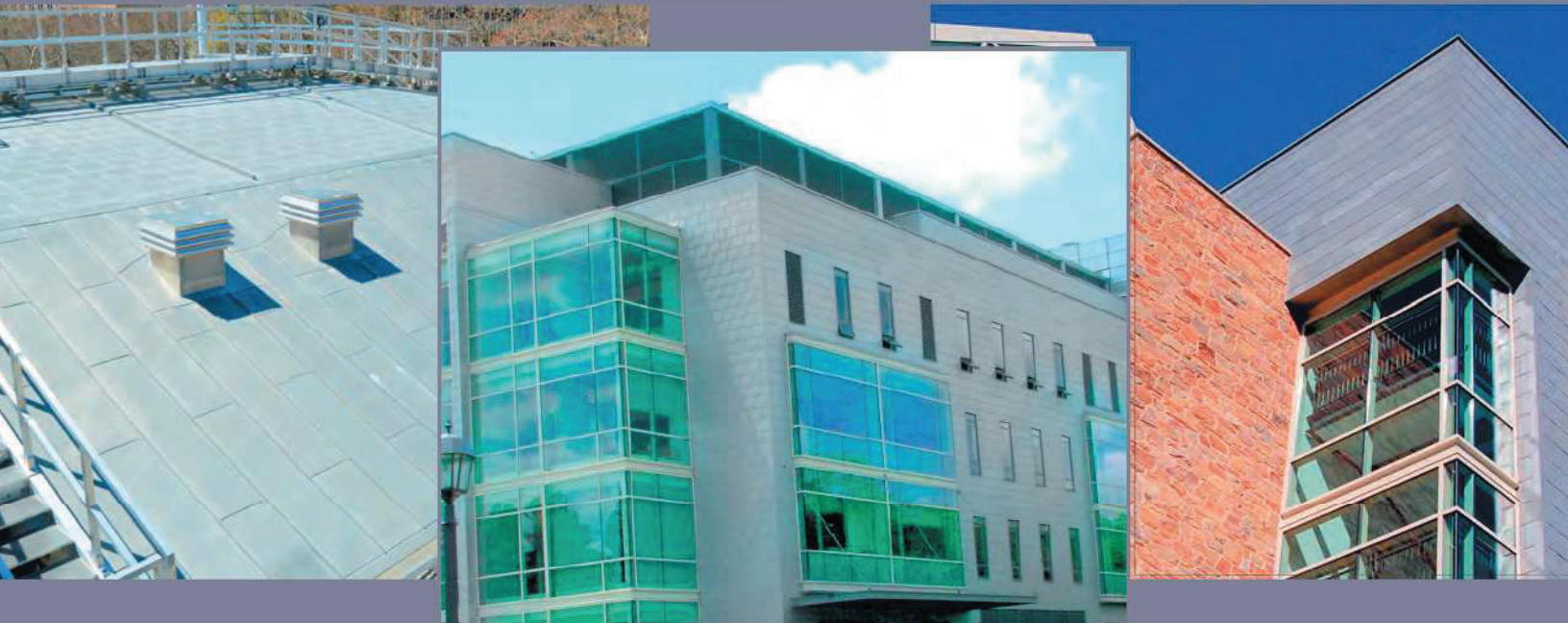


Eastern Region Office
2801 Kensington Avenue
Richmond, VA 23221



FreedomGray

Tin-Zinc Coatings Perform



Revere T-Z® Product is Durable, Attractive and Easy on the Environment.

Revere Tin-Zinc® products are coated on both sides with a unique, patented T-Z Alloy™ (tin-zinc alloy). It offers all the advantages of copper with a naturally weathering earthtone gray color. Revere's T-Z® coated products are rugged, environmentally friendly and aesthetically appealing, for use in virtually all architectural metal applications.

The three layers of FreedomGray Satin T-Z Alloy™.

- 1 Tin-zinc alloy with satin finish
- 2 Intermetallic layer
- 3 Copper (99.5% pure)

The tin-zinc alloy is applied to both sides of our sheets and coils, using the hot-dip process. This ensures complete coverage and eliminates voids.

A satin finish is factory-applied to FreedomGray Satin T-Z Alloy™, to reduce initial reflectiveness and provide a natural, weathered appearance. The satin-finished Tin/Zinc surface begins to oxidize and starts to darken upon exposure. Environmental conditions and severity of exposure dictate how long this will take.

As with plain and pre-patinated copper, FreedomGray Satin T-Z Alloy™ will always display differences in the shades and hues of its natural patina. These are **NOT** an indication of defective material. In many respects it is the variations that give T-Z® coated products their unique life, vitality and aesthetics.



Tin-Zinc Coated Products

T-Z® Alloy Coatings vs. Zinc: A Revealing Comparison.

When a durable gray architectural metal roof is called for, FreedomGray Satin T-Z Alloy™ offers numerous advantages over zinc. Like all architectural copper, FreedomGray T-Z Alloy™ is easier to form, simpler to install and more durable in most environmental conditions.

Some comparisons:

- **More versatile forming** – Our T-Z® coated products can be formed, installed and subjected to sub-freezing temperatures with no adverse effects.

Sharp, zero-radius bends, which are typical with all architectural metal work, can stress zinc to the point that it cracks or splits. Expansion movement caused by daily and seasonal temperature changes can aggravate minor splits and make them “run” or grow.

FreedomGray can be formed and installed with the same bends as plain copper.

- **Less restrictive installation** – Moisture on the reverse side of zinc can cause severe and rapid corrosion. In extreme conditions it can “rust through” in less than a year. To avoid this problem, the underside of zinc must be ventilated – installed above the roof deck. This difficult, costly installation is not necessary with our T-Z® coated product, which can be applied directly over roof decks.

- **Greater durability** – Ice dams, in valleys and along eaves, are a common winter occurrence in much of the country.

Water trapped behind these dams can (and does) penetrate locks and seams.

With zinc roofs, this can lead to “underside corrosion.” Moisture trapped on the underside of copper, on the other hand, has no negative effects, making T-Z® coated product a better choice for long-term durability.

- **Physical properties** – Properties of sheet zinc (coefficient of thermal expansion, tensile strength, creep rate, etc.) depend upon temperature and direction of rolling. The chart shown here compares the coefficients of thermal expansion for zinc, stainless steel and copper.

- **Soldering** – Zinc anneals at 212°F and melts at 784°F. Standard solder begins to flow at 420°F. As a result, soldering changes the grain size of zinc (anneals it) and weakens it at the seam. If too much heat is applied, a hole can easily be burned through zinc.

The melting point of architectural copper is 1,981°F. At 700°F, it takes almost an hour for copper to begin to anneal. As discussed later in this brochure, FreedomGray is soldered similar to plain copper.

In Any Environment, T-Z® Coated Copper Fits.

FreedomGray Satin T-Z Alloy™ is appropriate for use in most applications that would use copper or lead-coated copper. FreedomGray may be used not only for roofs, but also to form most architectural accents, gutters, downspouts and other rainwater carriers, and wall cladding.

Roofs and flashings using Revere's patented tin-zinc alloy have been exposed to industrial, seacoast, urban and rural environments without failure. Salt spray, salt fog and other accelerated weathering tests have also had no adverse effects. However, in some marine environments pitting may occur over time, please consult with Revere.

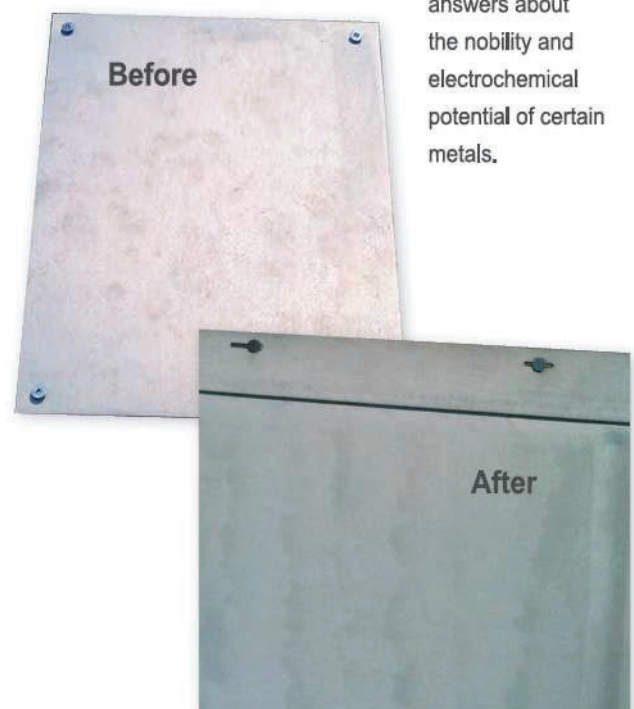
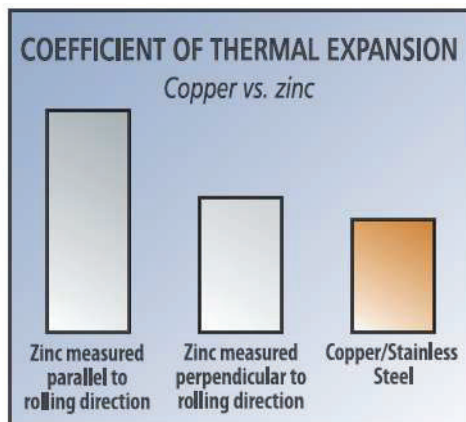
FreedomGray Satin T-Z Alloy™ is a practical choice for today's environmentally conscious clients.

Handling Considerations

Compatibilities

FreedomGray Satin T-Z Alloy™ is basically inert, allowing it to be used with most other architectural metals. When in doubt, contact Revere's Technical Advisory Service for

answers about the nobility and electrochemical potential of certain metals.



In most environments and applications, FreedomGray Satin T-Z Alloy™ will not stain other materials below them. However, drip edges and overhangs should still be designed to minimize water staining.

If desired, FreedomGray Satin T-Z Alloy™ may be painted without altering its physical properties.

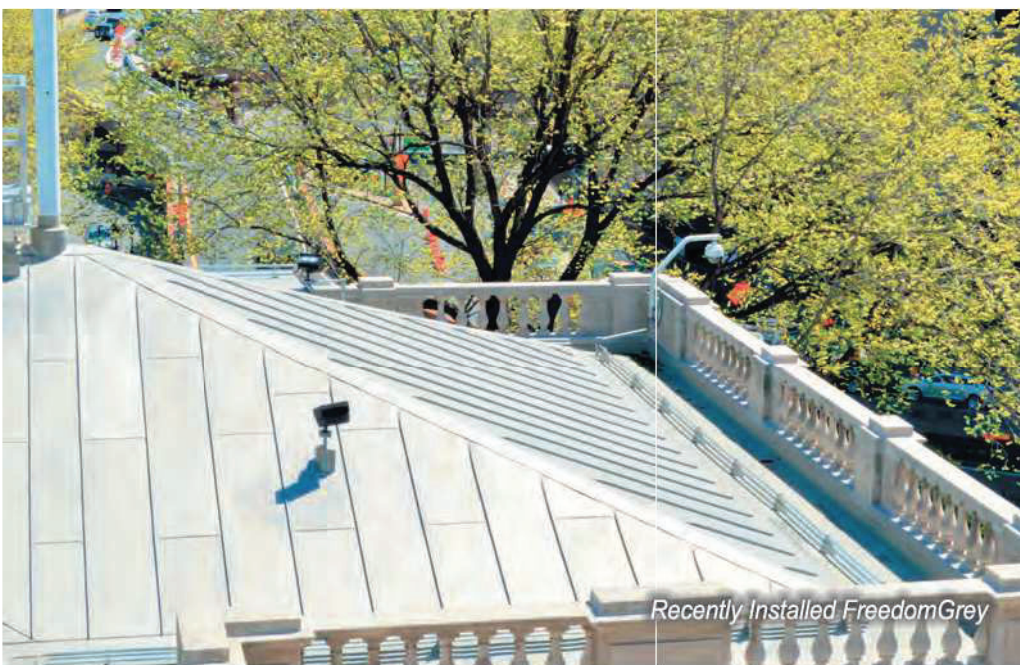
Inorganic acids, including hydrochloric acid, can damage FreedomGray Satin T-Z Alloy™. Steps should be taken to protect against runoff from acid-leaching substances, overspray from masonry cleaners (muriatic acid), tannic acid from some wood, and other acids.

Most commonly available underlayments may be used with these products. Before installing FreedomGray Satin T-Z Alloy™ with treated lumber, consult Revere and the lumber treater.

For safety, Revere always recommends the use of gloves and eye protection whenever handling any architectural metal.



Matured FreedomGray



Recently Installed FreedomGray



Specifications

Architectural Guide Specifications

Revere FreedomGray® and Satin T-Z Alloy™ is cut, bent, formed and installed using the same tools and techniques as with mill-finished copper. Complete details and specifications for the installation of architectural sheet copper are contained in the Revere manual *Copper & Common Sense*.

MATERIALS:

Sheet Copper

All FreedomGray sheet copper shall be standard, ounce-weight material conforming to ASTM specification B370.

Where FreedomGray Satin T-Z Alloy™ coated material is specified or noted on the drawings, copper shall be coated both sides with Tin/Zinc alloy a minimum of 0.0005" thick per side. Composition of the alloy shall be approximately 50% zinc and 50% tin with trace elements controlled for durability, corrosion resistance and color.

The T-Z Alloy™ shall be applied by the hot-dip process. All T-Z Alloy™ coated copper shall have a satin finish.

Solder

Where used on T-Z Alloy™ coated copper, solder shall conform to ASTM specification B32 and shall be pure tin **OR** lead-free, high-tin. If leaded solder is allowed a 60% minimum of tin is required.

WORKMANSHIP:

Handling & Storage

Store FreedomGray Satin T-Z Alloy™ coated copper sheets, coils and formed shapes off the ground, in an enclosed structure. Do **NOT** store in a manner or location that would allow water or moisture to remain between sheets or shapes prior to installation. Do **NOT** store on bare ground under a tarp or in another manner that may cause condensation to form on or between sheets or shapes. Caution must be taken to avoid moisture in storage of sheets, coils, pans, gutters or fascia. Storage in wet conditions, high-moisture areas or where condensation occurs may cause surface staining or corrosion, this can occur quickly.

Handle sheets and shapes so as to minimize scratches, dents, etc.

COMMENTARY:

In the absence of oxygen, standing water may cause water stains and, in severe cases, corrosion. Water stains and surface scratches should not affect the life or durability of FreedomGray Satin T-Z Alloy™; however, they can be aesthetically unattractive.

Soldering

Before soldering T-Z Alloy coated copper, surfaces to receive soldering should be chemically and/or mechanically cleaned to produce clean, bright alloy.

COMMENTARY:

To ease soldering, a tin-bearing flux may be applied to all surfaces to receive solder.

Installation

Except as noted elsewhere, form and install FreedomGray Satin T-Z Alloy™ as noted on the drawings and in the same manner as described for plain copper in Revere's sheet copper design manual *Copper & Common Sense*, latest edition.

Protection

FreedomGray Satin T-Z Alloy™ shall be protected during installation and cleaning of masonry with tarps, polyethylene sheeting or similar impervious materials. To prevent water stains due to condensation trapped on the metal's surface, protection must be removed at the end of each workday.

Cleaning

Remove excessive dirt and construction debris by washing thoroughly with clear water. Grease, oils, etc. may be removed by washing with alkaline commercial cleaning agent in hot water. Do not otherwise chemically or mechanically clean FreedomGray Satin T-Z Alloy™.

Available Forms of FreedomGray

Types	Sheets and coils
Weights	16-oz.; 0.0216" thick 20-oz.; 0.027" thick 24-oz.; 0.032" thick 32-oz.; 0.043" thick
Temper	H00-H01 – cold rolled
Stock sizes	36"x 120" x 16-oz. sheets 36"x 96" x 16-oz. sheets 36"x 120" x 20-oz. sheets 36"x 96" x 20-oz. sheets 500 lin. ft. coils of 20" and 24" wide, 16-oz. and 20oz.

NOTE: Other sizes and corresponding lead times available on request.

ORDERING INFORMATION:

Price

FreedomGray Satin T-Z Alloy™ are priced at a premium above Revere's Classic Copper finish. Contact your local Revere distributor for prices and lead times.

Minimum Order Quantity

One standard case or coil

Availability

Through Revere sheet copper distributors throughout the U.S., Canada and South America.

FreedomGray Satin T-Z Alloy™

Warranty

Revere warrants that, for a period of 25 years after delivery, with the exception of coastal areas within 1 mile of a salt water environment, FreedomGray Satin T-Z Alloy™ will comply with the written specifications accepted by Revere and will be free of defects in workmanship and materials for a period of 10 years.

Call Revere for complete warranty details.

Technical Guidance

If you have questions or concerns about the use of FreedomGray Satin T-Z Alloy™ on a particular project, please call (800) 448-1776, ext. 2554.

Do NOT Use FreedomGray Satin T-Z Alloy™

- 1) Below plain or pre-patinated copper
- 2) In areas subject to impingement (e.g., in areas where water falls off a higher roof onto FreedomGray Satin T-Z Alloy™)
- 3) In areas of concentrated or abrasive flow (such as in valleys on slate or tile roofs)
- 4) Below or next to Cedar, or any natural acid bearing woods without a surface protection of a temporary clear or colored latex paint. This paint should provide suitable protection for the Tin / Zinc coating for 1 year minimum.
- 5) Where treated lumber is in contact with our material or where runoff from treated lumber flows onto our material.
- 6) Consult your wood manufacturers and follow their recommendations for product suitability. Wood treatments applied by manufacturers change frequently, you must make sure to follow current recommendations.

Cautionary Uses

- 1) Interior applications where oxidation of the T-Z alloy coating may not occur in a short period of time due to its limited exposure.
- 2) Soffits and similar "protected" applications where weathering will be extremely slow.

