



Pearson Airplane Hangar

Pearson Air Museum
Vancouver, WA.

Historic Paint Analysis for the Interior and Exterior Window Sash and Trim



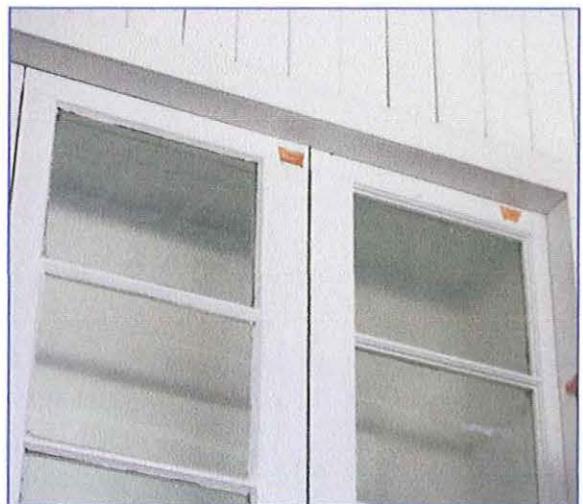
Prepared by

Sally Donovan & Bruce Howard
Donovan and Associates
Hood River, OR

In consultation with

Welsh Color & Conservation, Inc.
Bryn Mawr, PA

August 2, 2009



Pearson Historic Airplane Hangar, Vancouver, WA. Historic Paint Samples-Windows ONLY

**Paint Samples Extracted on July 21, 2009
By Sally Donovan and Bruce Howard**

Historic Information

The Pearson Air Museum's Airplane Hangar was built in 1918 as part of the Army Spruce Division's cut-up plant, the largest such facility in the world. With the United States fully committed to the war effort, there was a significant demand for the materials needed to build airplanes during World War I. Spruce, which was light, flexible and straight grained was ideal for the construction of aircraft frames. The Pacific Northwest enjoyed an abundance of spruce trees. Labor uncertainties and strife in the woods of the northwest, however, led the government to create the Spruce Production Division within the Army Signal Corps. Colonel Brice Disque was dispatched to Vancouver to oversee the operations. In a matter of weeks, his soldier labor force had built the world's largest spruce cut-up mill, supplying the needs of the United States and its overseas allies. At the end of the war in November 1918, spruce production was halted and the mill sold off as surplus.



The Pearson Hangar was originally part of the spruce production plant. The building was moved to its present location by the Army Air Service c. 1924, and retrofitted for use as an airplane hangar. The building has been used as a hangar ever since. During the World War II, the hangar was briefly used to house Italian prisoners of war. The Pearson Historic Airplane Hangar is the nation's oldest wooden structure still used to house aircraft (Pearson Air Museum on-line history).

Historic Investigation

Historic information gathered while conducting the paint sampling on July 21, 2009, indicates that the hangar windows, including the sash, header, and sills, were originally painted a darker color. This is consistent with the field observation of the darker green and red colors evident in the sampling. There was also evidence of green paint on some of the window glass.



Historic view of south façade of hangar. Pearson Air Museum collection.

Field Observations

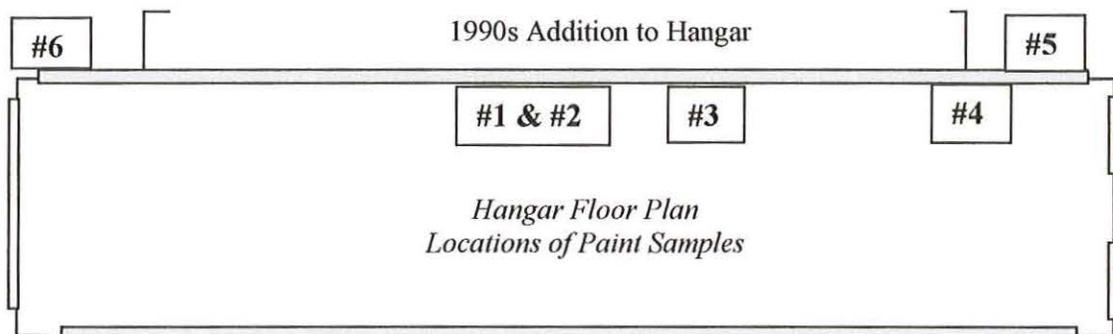
- All the windows on the south facade of the building and part of the east side have been replaced. The muntins are wider in dimension and the glass is newer.
- Some of the windows on the north façade were turned so the original exterior muntins are currently on the interior of the hangar. These were most likely turned in the 1990s when an addition was made to the north side of the building.
- The interior paint color appears to be a clear varnish or reddish color. There were also layers of green.

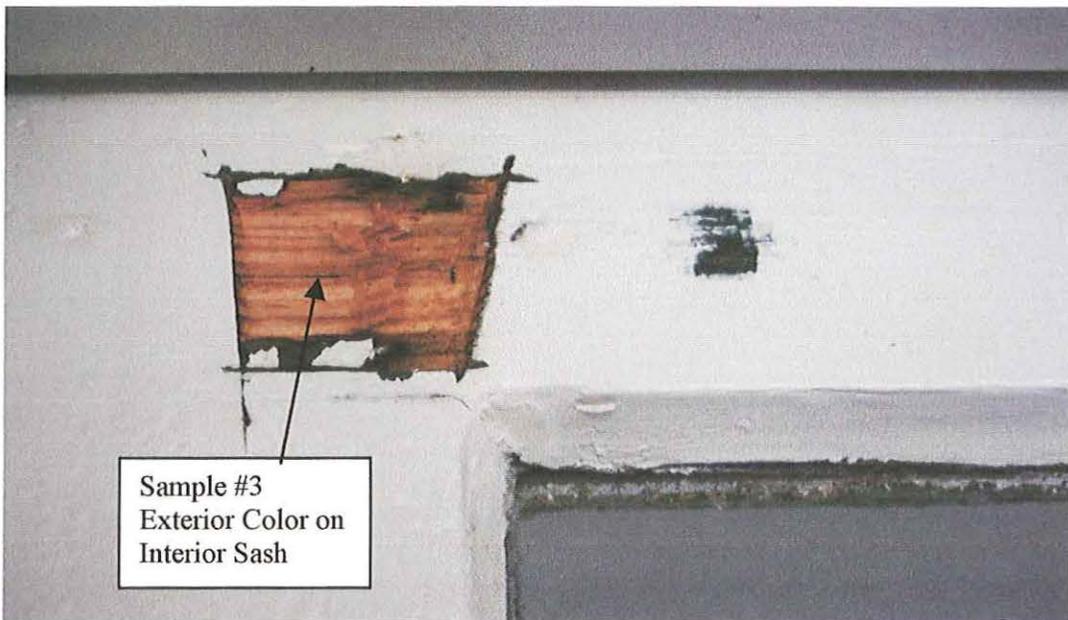
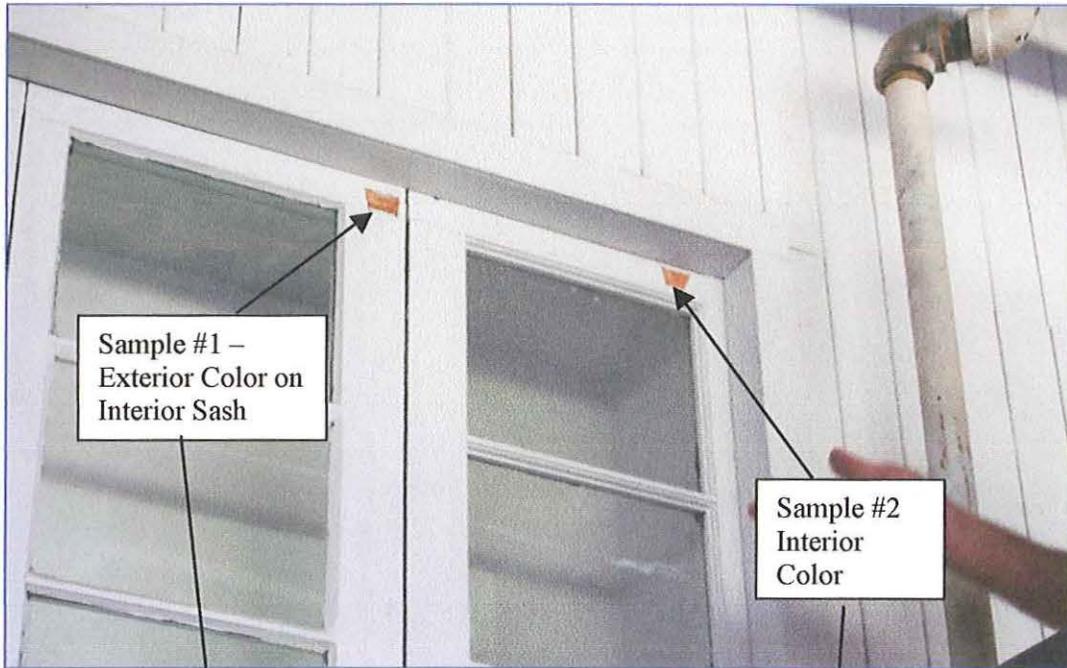


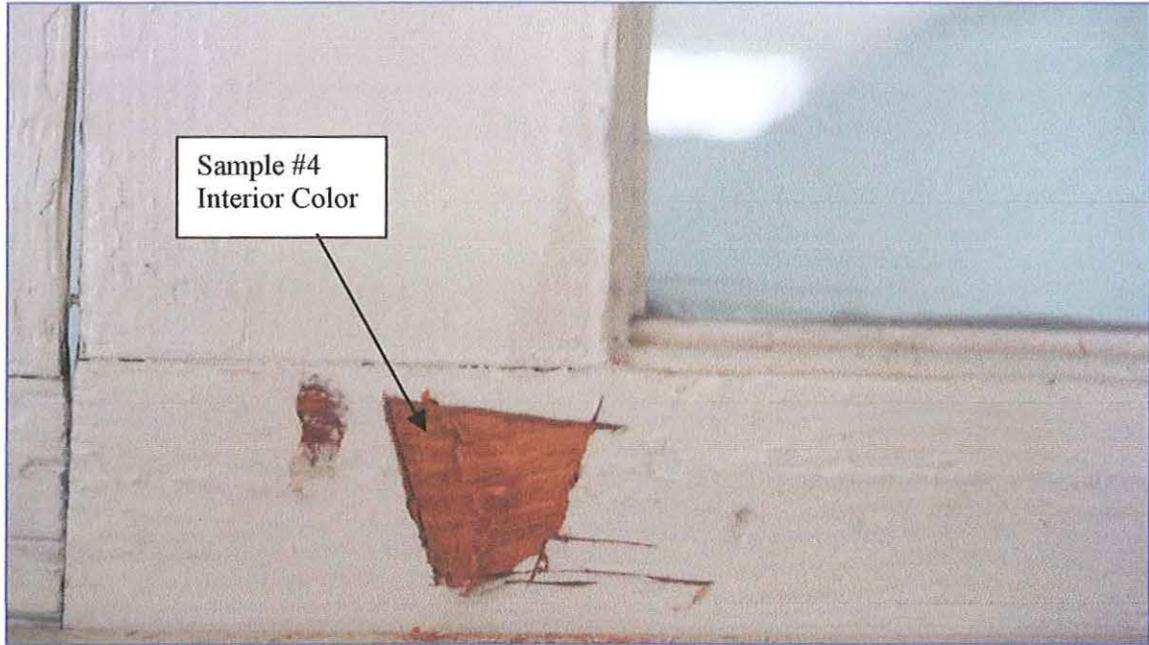
Paint Sample Locations

The window sashes are grouped six windows to a bay. Six samples were taken from the windows. Four on the interior and two on the exterior.

- **Sample 1:** Interior-North facade. The interior of this window sash was originally the exterior. Flipped in the 1990s. Sample taken in upper right-hand corner of sash. Fifth window bay from west; fifth sash from west.
- **Sample 2:** Interior-North facade. Sample for original interior color (sash was NOT flipped). Sample taken in upper right-hand corner of sash. Fifth window bay from west; sixth sash from west.
- **Sample 3:** Interior-North side. The interior of this window sash was originally the exterior. Flipped in the 1990s. Sample taken in upper right-hand corner of sash. Sixth window bay from west; first sash from west.
- **Sample 4:** Interior-North side-original window. Sample for original interior color (sash was NOT flipped). Sample taken in lower right-hand corner of sash. Ninth window bay from west; first sash from east.
- **Sample 5:** Exterior-North facade-original window on east end of facade. Exterior: third sash from east. Upper right-hand corner.
- **Sample 6:** Exterior-North facade-original window on west end of facade. Exterior: western-most sash. Upper right-hand corner.



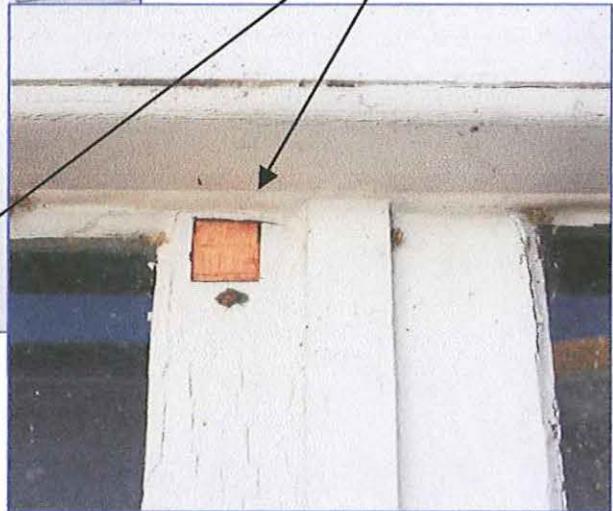




Sample #4
Interior Color



Sample #5
Exterior
Color





Sample #6-
Exterior
Sash



Analyses

The six paint samples were packaged and sent to Welsh Color & Conservation, Inc. for a stereomicroscopical analysis to determine the original paint color and the various paint layers. The analyses and color evaluation showed that all the windows on the interior and exterior were painted with a moderate reddish-brown, oil base, semi-gloss finish paint. The Munsell color notation for the color is 10 R 3/6 (see Appendix A for report and additional CIE lab color references).

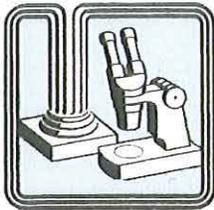
The analyses also included laboratory data sheets showing the layering sequence of the paint. Most of the samples of the exterior sash showed the same paint sequence: wood substrate; moderate reddish-brown, black, greens, and white. The interior sashes were painted the moderate reddish-brown with layers of white.

Recommendations

Follow the recommendation specified in the paint analysis. The samples from the interior and exterior of the Pearson Hangar windows indicate the sashes and trim were painted with reddish brown paint color (a semi-gloss, oil-base paint type).

Appendix A

Paint Analysis Report prepared by
Welsh Color & Conservation, Inc.
July 21, 2009



Welsh Color & Conservation, Inc.
Analysis of Historic Paints and Wallpapers

P.O. Box 767
Bryn Mawr, PA 19010-0767
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E-mail: fswelsh@welshcolor.com

Website: www.welshcolor.com

July 31, 2009

Ms. Sally Donovan, Principal
Donovan & Associates
1615 Taylor Avenue
Hood River, Oregon 97031

Re: Pearson Airplane Hanger
Vancouver, Washington

Dear Ms. Donovan:

We received six paint samples from your firm from the Pearson Airplane Hanger constructed in 1918 in Vancouver, Washington. The samples are from the exterior and interior windows. We conducted a stereomicroscopical analysis on them to determine the layer structure and the original color of the first finish coat.

Our analyses and color evaluation disclose that all were originally finish painted with a moderate reddish orange, oil-based, semi-gloss finish paint. We matched the original color to the both the Munsell color system and also have provided corresponding CIE L*a*b* color reference values. A sample of the color is included.

Feature: Windows	Color: Moderate Reddish Brown Finish Type: Oil Reflectance: Semi-gloss	Color sample: 
The CIE LAB (illum C ² ; 0-45° geometry) color references are: L* = 31.13 a* = +24.44 b* = +21.51		The Munsell Color notation is: <u>10 R 3/6</u>

On our website, <http://welshcolor.com/matching.html>, we provide additional information on color matching new paint. If you have any follow-up questions or need additional color samples, please call me.

Thank you for your interest.

Sincerely,

Frank S. Welsh

LABORATORY DATA SHEETS

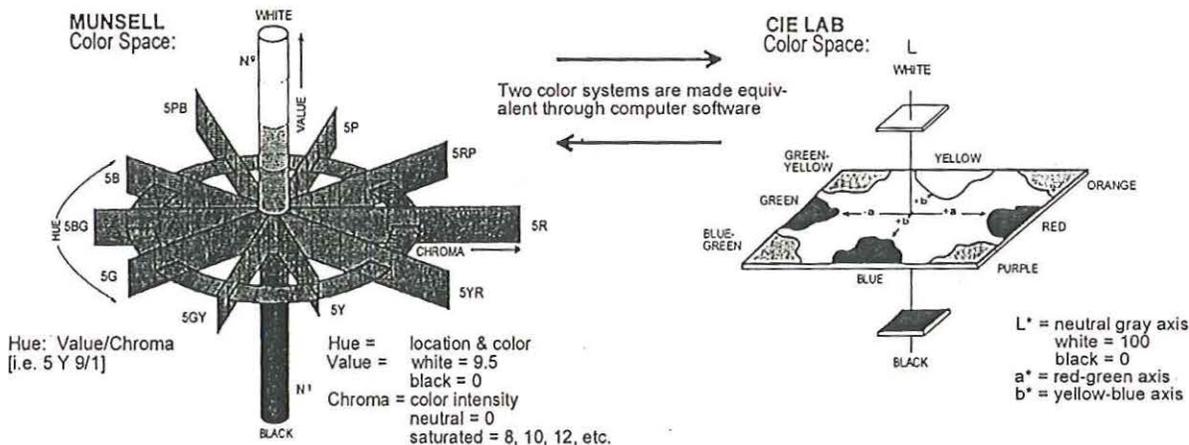
Sample Number	Location/Description	Layers and Comments	Sample Number	Location/Description	Layers and Comments
1	Interior sash was originally an exterior sash.	1 F MRB Orig. 2 F Black 3 F Dark Green 4 F Dark Green 5 F White. Note: MRB = 10 R 3/6	5.	Exterior North facade - East end.	Same as # 3
2.	Interior sash	1 F MRB Orig 2-3 F's whites	6.	Exterior North facade, West end.	Poor evidence - appears to be same as #5
3	Interior - originally an exterior sash	Very poor evidence of: 1 F MRB Orig 2 F Black 3 F DK Green 4 F Olive 5 F White			
4.	Interior - inside sash	Same as ext.-2			

LABORATORY DATA

PROJECT	DATE OF ANALYSIS
<i>PEARSON AIRPLANE HANGER</i>	<i>7/31/2009</i>
SPACES	ANALYST
<i>EXTERIOR & INTERIOR</i>	Frank S. Welsh

EQUIPMENT AND METHODOLOGY

- Equipment
 - Bausch & Lomb stereomicroscope (10 - 105x)
 - Nikon SKE polarized light microscope
 - Schott halogen fiber-optic illuminator (3200K)
- Evaluation of samples for original color
 - Architectural paints discolor as they age
 - Attempts made to find cleanest & brightest evidence
- Color assessment and matching:
 - Visual matching in tungsten light 3200K
 - Colors named according to traditional usage
 - Mathematical color system: CIE LAB ($L^* a^* b^*$)
 - Visual color system: Munsell
 - Portable spectrophotometer (0 - 45° geometry)
 - General illumination: Tungsten (2400K)
 - PC for spectrophotometric & CIE to Munsell software
 - Requisite samples bleached with U.V. radiation to attempt reversal (20% - 50%) of yellowing of oil binder



DESCRIPTION OF PRESENTATION OF LABORATORY DATA FROM THE ANALYSIS

- The following pages contain all of the requisite information found on each sample gathered during the laboratory analysis of the historically significant coatings.
- The information on these pages is the data from which the conclusions have been drawn that are presented in the summary of finishes.
- The key to abbreviations used in the data sheets is found on the following page.
- Illustrations diagramming the locations from which the samples were taken are included in the Field Note - Sample Location sheets.

LABORATORY DATA

KEY TO THE ABBREVIATIONS USED IN THE LABORATORY DATA SHEETS

For Layer/Coat:

- P = prime or sealer coating
- I = intermediate or second prime
- Gr = ground or base coating for marbling or graining
- F = finish for final coating

For Color Name:

- W = white
- YW = yellowish white
- YG = yellowish gray
- GY = grayish yellow
- BL = blue
- GRN = green
- BRN = brown
- MRB = moderate reddish brown
- MOY = moderate orange yellow
- POY = pale orange yellow
- LT = light
- MED = medium
- VRY = very
- PL = pale
- GRY = gray or grayish
- BLK = black

For Munsell Value:

- This is the color reference value in the Munsell Color System.

For Type of coating:

- O = oil
- D = distemper or calcimine
- Wsh = whitewash
- Vrn = varnish
- Stn = stain
- Pb = lead content

For Gloss:

- Fl = flat finish
- L = low gloss
- S = semi-gloss
- G = gloss
- H = high-gloss

For Age:

- orig = original
- er = early
- md = middle
- lt = late
- c = century