



Planning, Development & Transportation

Community Development & Neighborhood Services

281 North College Avenue
P.O. Box 580
Fort Collins, CO 80522.0580

970.416.2740
970.224.6134- fax
fcgov.com

REPORT OF ALTERATIONS TO DESIGNATED RESOURCE

Site Number/Address: 425 Mathews Street
Laurel School National Register Historic District
ISSUED: November 27, 2019

Dr. Sarah Breseke & Wouter Montfrooij
425 Mathews St.
Fort Collins, CO 80524

Dear Dr. Breseke and Mr. Wontfrooij:

This report is to inform you of the results of this office's review of proposed alterations to the Clyde Brown House at 425 Mathews, pursuant to Fort Collins Municipal Code, Chapter 14, [Article IV](#). A copy of this report may be forwarded to the Colorado Office of Archaeology and Historic Preservation as well.

The alterations reviewed include:

- Repoint and repair masonry throughout building and foundation, including repair of both chimneys. Coal chute will be infilled to provide structural stability but will remain visible.

Our staff review of the proposed work finds the alterations do meet the [SOI Standards for Treatment of Historic Properties](#). A summary is provided below:

Applicable Code Standard	Summary of Code Requirement and Analysis (Rehabilitation)	Standard Met (Y/N)
SOI #1	<i>A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships;</i> The property is not changing use as a result of this project.	Y

SOI #2	<p><i>The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.</i></p> <p>The brick exterior is a defining feature and will be repointed/repared consistent with NPS Preservation Brief 2, <u>Repointing Mortar Joints in Historic Masonry Buildings</u>. The stone foundation will be repointed/repared, also consistent with Brief 2 as noted above.</p>	Y
SOI #3	<p><i>Each property will 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 elements from other historic properties, will not be undertaken.</i></p> <p>Work on the masonry and foundation consists of repair. No additions or conjectural features are proposed as part of this project.</p>	N/A
SOI #4	<p><i>Changes to a property that have acquired historic significance in their own right will be retained and preserved.</i></p> <p>This project is not proposing the removal of any character-defining features or historic alterations, such as the rear “mud porch” addition.</p>	N/A
SOI #5	<p><i>Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.</i></p> <p>The project involves repair/repointing of masonry for the building walls, foundation, and chimneys, all of which are character-defining features. Proposed work is expected to preserve distinctive features of the masonry, and will undertake a mortar analysis prior to completing repointing. In the cases of deteriorated elements, such as the retaining wall for the basement stair and the two chimneys, the project will repair and, where necessary, reconstruct these elements using the same materials. In cases where materials are too deteriorated to salvage, they will be replaced in-kind. The enclosure of the coal chute would typically not be recommended but appears necessary to bolster the brick wall above – the feature will remain visible, but infilled.</p>	Y

SOI #6	<p><i>Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.</i></p> <p>Masonry work is entirely repair, focusing on repointing/repair of masonry joinery. In some cases, replacement will be necessary (some deteriorated bricks and stucco), and the project will replace these elements in-kind.</p>	Y
SOI #7	<p><i>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.</i></p> <p>The masonry work proposed will be completed following a mortar analysis by experienced masons familiar with NPS Preservation Brief 2 on repointing historic buildings. Repointing is not expected to cause damage to the building.</p>	Y
SOI #8	<p><i>Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.</i></p> <p>Excavation is not proposed as a part of this project.</p>	N/A
SOI #9	<p><i>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.</i></p>	N/A
SOI #10	<p><i>New additions and adjacent or related new construction will 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.</i></p>	N/A

This project is not expected to have a negative effect on the building's contributing status to the Laurel School Historic District. Furthermore, as a property that is eligible for City Landmark designation, and for potential listing in the National and State Registers individually, the project should allow the property to retain this eligibility.

If you have any questions regarding this review, please contact me. I may be reached at jbertolini@fcgov.com or at (970) 416-4250.

Sincerely,

Jim Bertolini
Historic Preservation Planner

Design Review Application: Large Projects

Design review is a process used to examine projects in designated historic areas or properties for architectural design and compatibility with the nearby historic built environment. Applications submitted for design review must be accompanied with specific information which adequately describes or studies the proposal. To comply with the required submittal standards, submitted documentation shall clearly illustrate the existing conditions as well as any proposed alteration(s).

Submit this form, completed, with the required submittal documentation.

Project Address:	425 Mathews St	
Designated Fort Collins Landmark	<input type="checkbox"/>	Listed on State Register/National Register of Historic Places <input checked="" type="checkbox"/>
Applicant Name:	Dr. Sarah Breseke	
Email Address:	sbreseke@gmail.com	
Phone number:	573 639 0112	
Owner Name:	Sarah Breseke	
Owner Email Address:	ibid.	
Owner Phone Number:		

The following attachments are REQUIRED:

- ☐ Complete Application for Design Review
- ☐ Detailed Scope of Work
- ☐ Color photos of existing conditions

Reminders:

Complete application would need all of checklist items as well as both pages of this document.

Detailed scope of work should include measurements of existing and proposed.

Please note: if the proposal includes partial or full demolition of an existing building or structure, a separate demolition application will need to be approved.

Additional documentation may be required to adequately depict the project and its impact on a historic property or historic district, such as plans, elevations, window study, or mortar analysis. If there is insufficient documentation on the property, you could be required to submit an intensive-level survey form (at the applicant's expense).



Design Review General Application

This application should accompany your submittal of all the documents listed on the Design Review General Application Checklist. Failure to fill out these documents fully will result in delayed review.

Itemized List of Proposed Alterations (e.g. demolish rear porch; repair or replace windows)

☐ replace/repair roof to mimic original

☐ regrade yard for roof runoff

☐ replace/repair front porch to mimic original

☐ replace/fix interior plumbing

☐ tuckpoint masonry throughout,
including two chimneys

☐ upgrade electrics to grounded

Materials of work (e.g. current/proposed materials of porch, windows, siding, roof, etc.)

Be specific about materials. What kind of wood? Exposure of siding?

☐ _____

☐ _____

☐ _____

☐ _____

☐ _____

☐ _____

☐ Is any **partial or full demolition** required for work you are planning to do on this property?

Partial demolition could include scopes such as taking off existing rear porches to create space for a new addition or removing an existing wall or demolishing a roof. If you are taking away pieces of the existing residence, you are likely undergoing some partial demolition.

By signing below, I attest that no additional exterior work, siding replacement, or window replacement will occur under this application.

Applicant Signature:  Date: 8/3/19



Mortar deterioration attic



mortar deter. Basement



mortar deterioration basement



























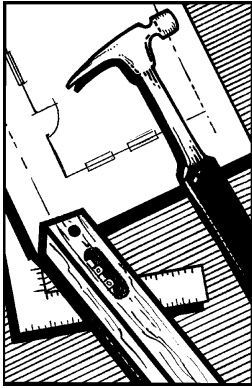












Empire Carpentry LLC

PO Box 245

Bellvue, Colorado 80512

Phone: (970) 493-3499

Fax: (970) 493-2088

empire@verinet.com

Sarah Breseke & Wouter Montfrooij
425 Mathews Street
Fort Collins Colorado 80524

November 5th 2019

Job# 32-19-DAP

Re: **Mortar Analyses** for stone foundation and exterior brick wall; 425 Mathews Street, Ft. Collins, CO.

Two samples were removed from the exterior of the Residence: one from the stone foundation and one from the exterior brick wall above.



Figure 1: 425 Mathews

FOUNDATION: The Foundation is a rubble foundation with cut and fitted outer stone. The stone is a local buff color. The Mason bedded the stone in a straight lime and sand mix. On the outer edge of this soft bedding mortar, the Mason placed a Portland hardened 3/8" finish bead and cap, to seal the exterior of the joint. All this is typical for the age of the Residence.

Mortar: The mortar was observed to be as soft as the usual lime based mortar of the time. It had a coarse feel to it. The color was greyish-white. The sample could crumble, rolled in fingers.

A 33 gram sample was lightly ground, and then weighed, and washed in a 12.5% acid solution. After irrigating and drying the residue, the sample weighed 29 grams. The residue looked to be a sand mix with minimal silt (see Attachment A).



Figure 2: Sand from foundation mortar. Note sand is angular.

The sand was particularly clean, angular and seemed to be sifted with a #10 screen. It seems different that the grains are angular, so most likely not dredged from the Poudre River. The ratio (in volume) was one unit lime per four units sand. Reviewing weight and volume, plus noting the location is toward the exterior of the stone,

The original bead seems to be grey in color, so the cement should be grey in color. The lime will help lighten the color.



Figure 3: Original back of the bead under a microscope, showing a chunk of lime surrounded by grey portland.

Because of the Portland found in the outside bead, no analysis was done on it.

Conclusion: The existing mortar is somewhere between a Type O and a Type N. **It's suggested to go with a Type N, to make for a harder edge bead and cap, while being similar to the bedding mortar. Color of cement should be grey.** See Attachment A for Detail.

EXTERIOR BRICK MORTAR:



Figure 4: Angular sand found in brick mortar.

In this age of home, low fire/pressed brick was used to build. The brick found on this home is a higher grade, on the outside, than the common, salmon colored brick. The mortar joint is about one quarter inch or smaller.

Mortar: The mortar removed came out as a powder, and soft enough to crumble between your fingers. The color was white-to-grey, especially on the outer edge.



Figure 5: Dry brick mortar before dissolution.

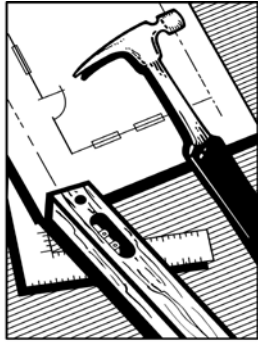
A sample of 35 grams was lightly ground and introduced to a 12.5% Hydrochloric Acid solution. After irrigating and drying, the sample weighed 26grams. The residue, again, seems to be sand mix with minimal silt.

The aggregate was again angular, with minimal rounded; most likely not from the River. The aggregate was screened to a lower screen of #35. See Attachment B.

Conclusion: Because of this thin joint, It's believed that a smaller aggregate was required. Also, the amount of lime was almost double that found in the stone mortar, possibly for better adhesion. **A Type K variant should be used for repointing, adding just a bit of cement for strength. Cement added should be Federal Cement (white) for color.** See Attachment B for Detail.

Kevin M Murray
November 2019
Bellvue, Colorado

General Contracting & Design - Residential & Commercial - Remodeling - Preservation



EMPIRE CARPENTRY

MORTAR ANALYSIS SHEET

NAME: Sarah Breseke & Wouter Montfrooij
ADDRESS: 425 Mathews Street, Fort Collins, CO 80524

MORTAR LOCATION: Stone Foundation Mortar

COLOR: Grey/White

WEIGHT: 33g

%HCL: 12.50%

DRIED WEIGHT: 29g

SIEVE:	5grt	10grt	35grt	60grt	120grt	230grt	Base
	Gravel	Fine Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	silt clay
WEIGHT:	1g(-)	3g	25g	1g (-)	1g (-)		
By Weight %:	1%	10%	87%	1%	1%		
Existing Recipe: By Volume	Lime:		20%				
	Portland:		%				
	Sand:		80%				
	Clay or Silt		%				

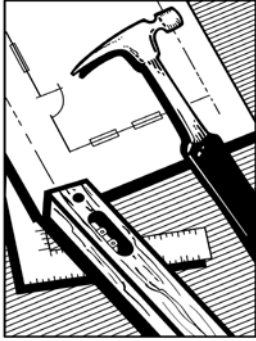
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ATTACHMENT A - STONE FOUNDATION

EMPIRE CARPENTRY
PO Box 245, Bellvue, Colorado 80512

empire@verinet.com

ATTACHMENT B - BRICK EXTERIOR



EMPIRE CARPENTRY MORTAR ANALYSIS SHEET

NAME: Sarah Breseke & Wouter Montfrooij
ADDRESS: 425 Mathews

EMPIRE CARPENTRY
PO Box 245, Bellvue, Colorado 80512

empire@verinet.com

MORTAR LOCATION: Brick Exterior

COLOR: Grey/White

WEIGHT: 35g

%HCL: 12.50%

DRIED WEIGHT: 26g

SIEVE:

	5grt	10grt	35grt	60grt	120grt	230grt	Base
	Gravel	Fine Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	silt clay
WEIGHT		<1g	18g	7g	<1g		
%		2%	69%	27%	2%		

Existing Recipe:
By Volume

Lime:	33%
Portland:	%
Sand:	67%
Clay or Silt	%