179 PLEASANT STREET

PORTSMOUTH, NEW HAMPSHIRE

AERIAL VIEW

HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

1.0

LETTER OF AGENDA

We respectfully submit this Application for Amended Approval. The current HDC Approval was granted to the prior owner.

At this time, the team is primarily focusing all efforts on the Historic Thompson Mansion, and the Annex. We have included the following items for your consideration:

David Calkins GC & CM

- Exterior Renovation scope of work description
- Brick and Mortar analysis of similar historic masonry at 205 Market Street
- Masonry Sealant

CJ Architects - Architectural Design Proposal

- Property Timeline
- Proposed Annex Scope of Work
- Proposed Design & Restoration
- Existing and Proposed Details & Documentation
- Materials
- Reference

Gorham Structural Engineering - Existing Structural Report

Architectural Conservator - Assessment of Historic Integrity

Thank you for your consideration.
Sincerely,

Carla Goodknight, AIA, NCARB
Principal, CJ Architects

PROPERTY TIMELINE: Sources: Portsmouth Anthenaeum - Portsmouth Permitting Archives

1780's: Captain Thomas Thompson House is Constructed (same time period John Langdon built his house next door)
1859: Mark H. Wentworth purchased the house from the Thompson Family and made several Victorian improvements
1903: Mark H. Wentworth passed away and leaves the house to his daughter Susan J. Wentworth
1940: Susan J. Wentworth passed away and the house is owned by several people
1962: Doctors office is approved and built in carriage house
1978: Kitchen added to the apartment in main house, apartment was used as housekeeper quarters.
1979: 10 x 16 addition added as "carport" to rear of connector building
1979: Single family house was approved as "duplex"
1980: Remodel 2nd floor bathroom
1981: Remodel kitchen and add kitchen powder room, remodel 2 other bathrooms in house
1982: Sun porch was added as 3 season structure, was a garden terrace prior
1983: Widows walk was reproduced,only on the front of the building
1983: Apartment was remodeled in main house
1984: Widows walk was expanded to all four sides of the house
1986: The lot was sub-divided into 2 lots 179 & 181 (This is not clear)
1986: Carriage house was remodeled and expanded upon
1988: Sun porch was reroofed, and door added from main house to access roof top
1988: 3rd floor of main house was extensively renovated and finished with new living space, skylights added
2003: Lot line adjustment on right side of 181
2005: Lots 179 &181 are voluntarily merged
2014: Widows walk completely reproduced on all 4 sides
2018: Larger garage door was installed in carriage house and misc. in-fill framing
2018: Section of wooden fence was replaced on the front only
2019: HDC Certificate of Approval granted for renovations and expansions
2020: 1-year extension granted for HDC Certificate of Approval granted for renovations and expansions
2020: Flooring in carriage house was removed and stored
2021: New Ownership
2021: Permit Issued for nonstructural demolition

HISTORIAN CONSULTANTS

John Schnitzler - Attended 2021-12-21 Walkthrough
Master Carpenter -Strawbery Banke

Elizabeth Farish - Attended 2021-12-21 Walkthrough
Chief Curator – Strawbery Banke

Tom Hardiman - Assistance in Historic Research
Keeper – Portsmouth Athenaeum

Steven Mallory - Attended 2022-01-10 Walkthrough
Preservation Historian

Bruce Blanchard - Attended 2022-01-12 Langdon & Thompson House Walkthroughs
Preservation Manager for the Piscataqua Area - Historic New England

Melissa Kershaw - Attended 2022-01-12 Langdon & Thompson House Walkthroughs
Regional Site Administrator, Northern New England - Historic New England

Dylan Peacock - Attended 2022-01-12 Langdon & Thompson House Walkthroughs
Senior Preservation Services Manager - Historic New England

Tim Barry – Attended 2022-02-08 Walkthrough
Historic Painter

PREVIOUSLY APPROVED SOUTH ELEVATION (FOR REFERENCE)

KEY:

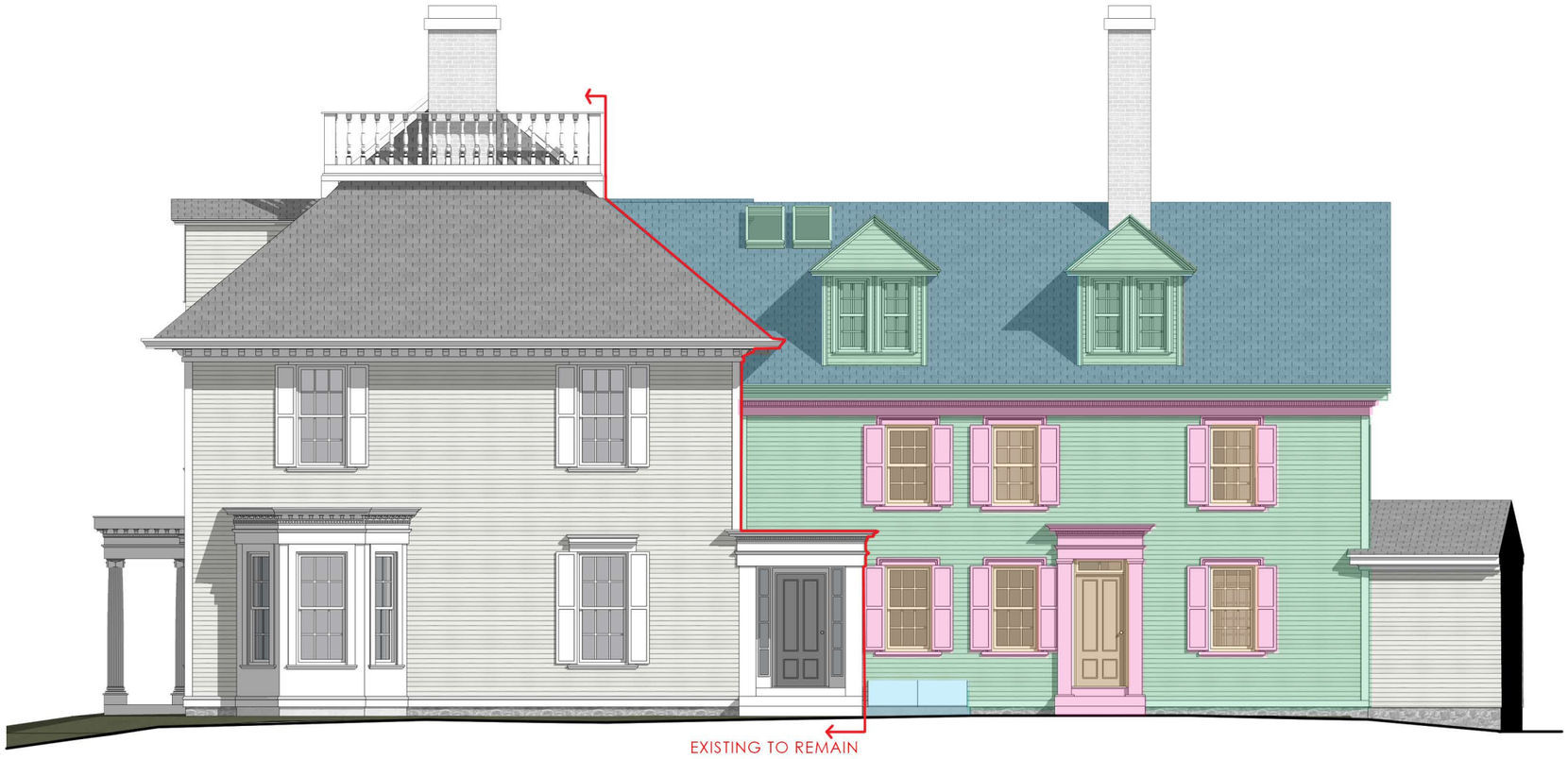
TRIM TO BE REMOVED, RESTORED, & RE-INSTALLED

WINDOWS & DOORS TO BE REMOVED, RESTORED, & RE-INSTALLED

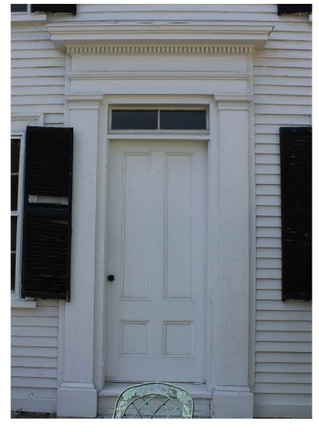
SIDING, TRIM, & WINDOWS TO BE REPLACED IN KIND

FRAMING, ROOFING, BULKHEAD, & CHIMNEY TO BE DEMOLISHED

VIEW OF EXISTING SOUTH ELEVATION



EXISTING SOUTH ELEVATION



179 PLEASANT STREET

PORTSMOUTH, NEW HAMPSHIRE

SELECTIVE DEMOLITION, PRESERVATION, AND RESTORATION

SOUTH ELEVATION

HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

2.0

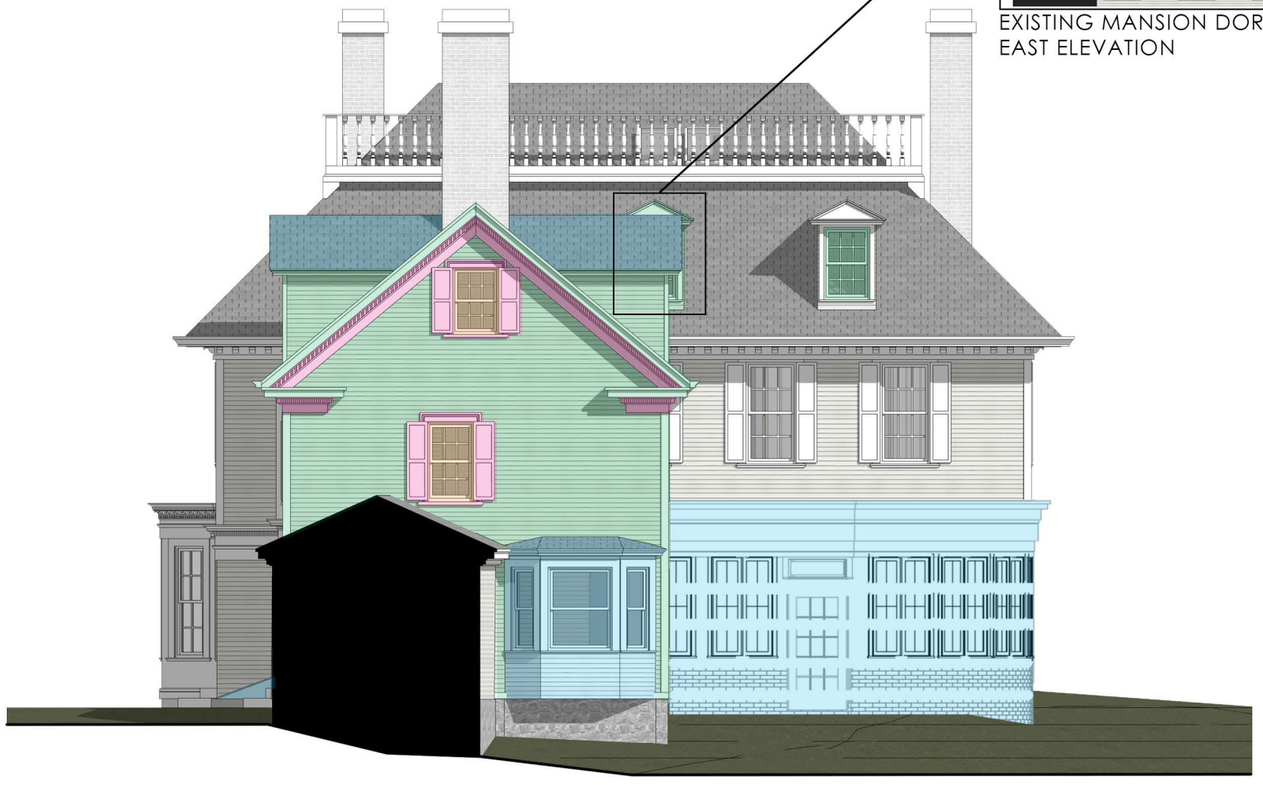
PREVIOUSLY APPROVED EAST ELEVATION (FOR REFERENCE)

KEY:

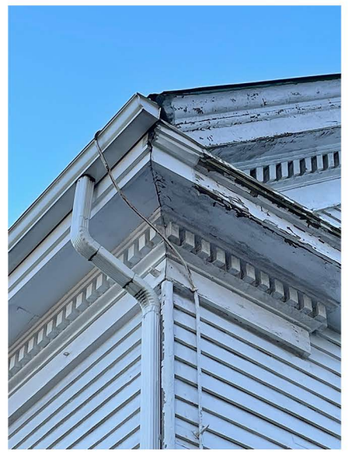
- TRIM TO BE REMOVED, RESTORED, & RE-INSTALLED
- WINDOWS & DOORS TO BE REMOVED, RESTORED, & RE-INSTALLED
- SIDING, TRIM, & WINDOWS TO BE REPLACED IN KIND
- FRAMING, ROOFING, BULKHEAD, & CHIMNEY TO BE DEMOLISHED

EXISTING MANSION DORMERS
EAST ELEVATION

VIEW OF EXISTING EAST ELEVATION



EXISTING EAST ELEVATION



179 PLEASANT STREET
PORTSMOUTH, NEW HAMPSHIRE

SELECTIVE DEMOLITION, PRESERVATION, AND RESTORATION

EAST ELEVATION
HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

2.1

PREVIOUSLY APPROVED NORTH ELEVATION (FOR REFERENCE)

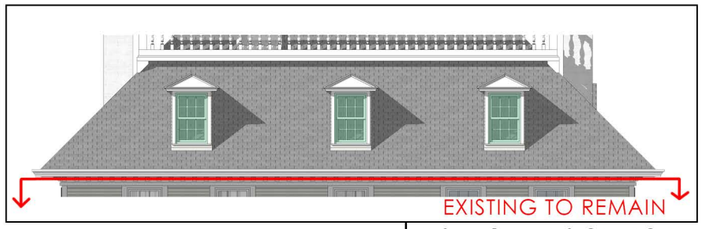
KEY:

TRIM TO BE REMOVED, RESTORED, & RE-INSTALLED

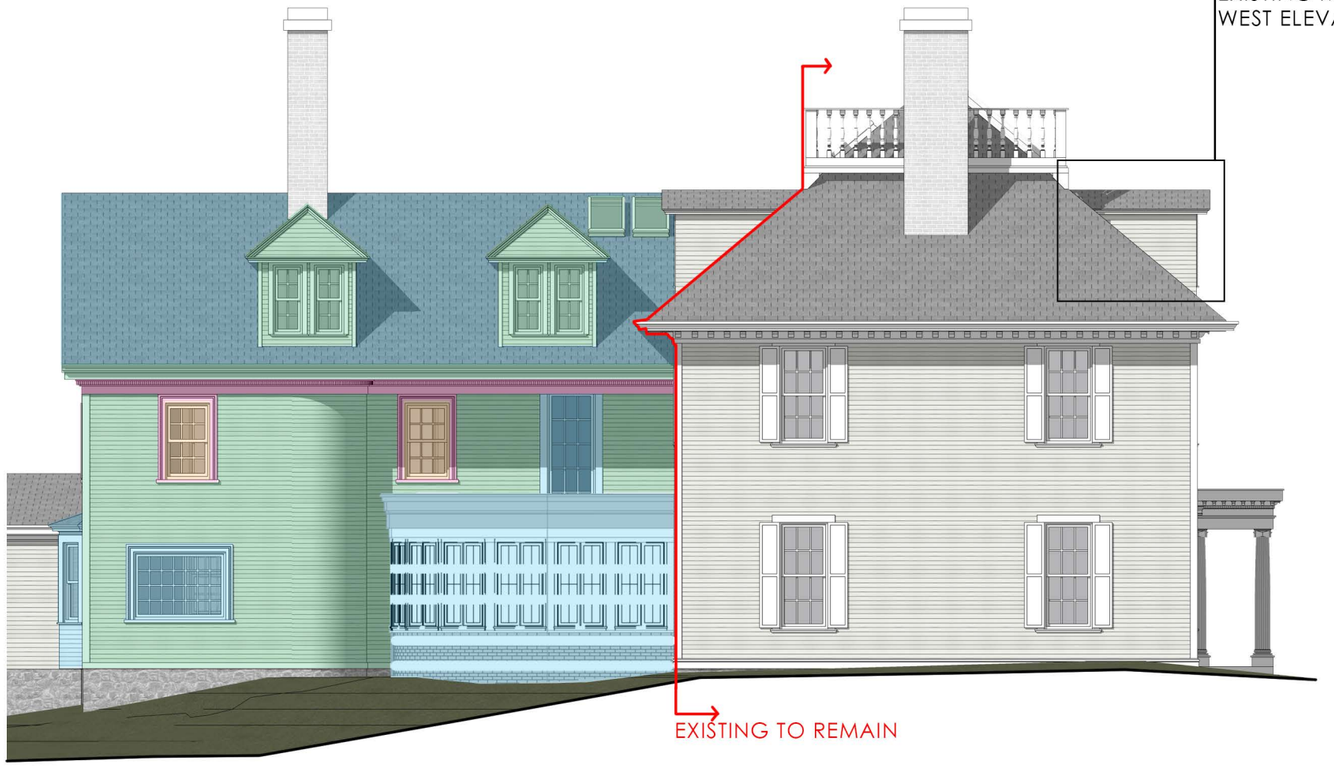
WINDOWS & DOORS TO BE REMOVED, RESTORED, & RE-INSTALLED

SIDING, TRIM, & WINDOWS TO BE REPLACED IN KIND

FRAMING, ROOFING, BULKHEAD, & CHIMNEY TO BE DEMOLISHED



EXISTING MANSION DORMERS
WEST ELEVATION



EXISTING NORTH ELEVATION

VIEW OF EXISTING NORTH ELEVATION

179 PLEASANT STREET

PORTSMOUTH, NEW HAMPSHIRE

SELECTIVE DEMOLITION, PRESERVATION, AND RESTORATION

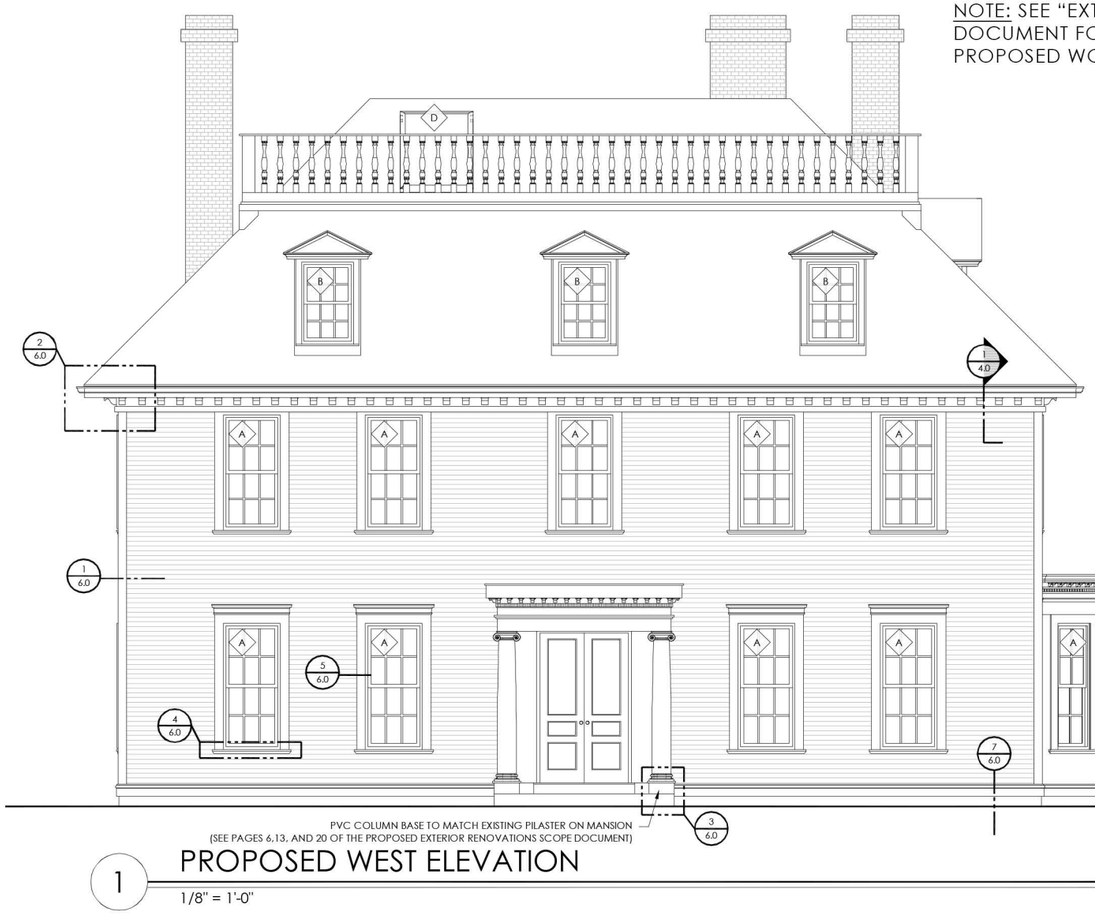
NORTH ELEVATION

HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

PREVIOUSLY APPROVED WEST ELEVATION
(FOR REFERENCE)

VIEW OF EXISTING WEST ELEVATION



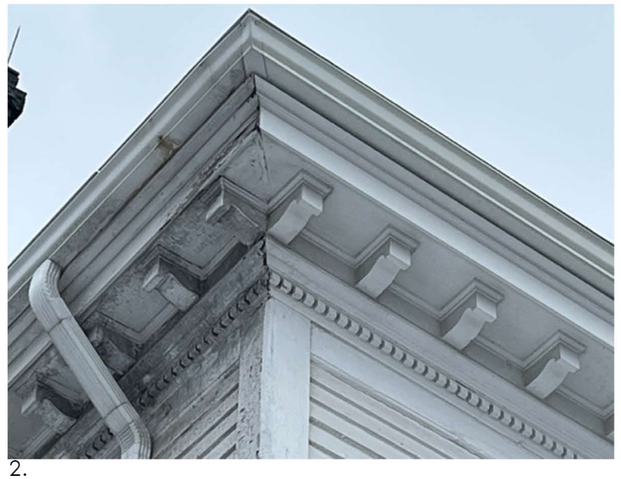
PVC COLUMN BASE TO MATCH EXISTING PILASTER ON MANSION
(SEE PAGES 6.13, AND 20 OF THE PROPOSED EXTERIOR RENOVATIONS SCOPE DOCUMENT)

1 PROPOSED WEST ELEVATION

1/8" = 1'-0"

NOTE: SEE "EXTERIOR RENOVATIONS" SCOPE DOCUMENT FOR DETAILED DESCRIPTION OF PROPOSED WORK PER **ELEVATION**.

1.



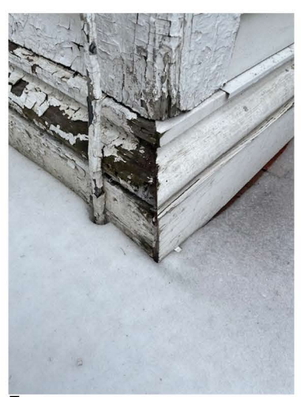
2.

3.

4.

5.

6.



7.

179 PLEASANT STREET

PORTSMOUTH, NEW HAMPSHIRE

PROPOSED WEST ELEVATION

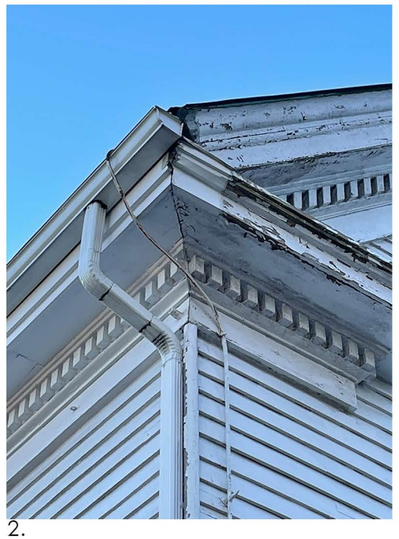
HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

PREVIOUSLY APPROVED SOUTH ELEVATION (FOR REFERENCE)

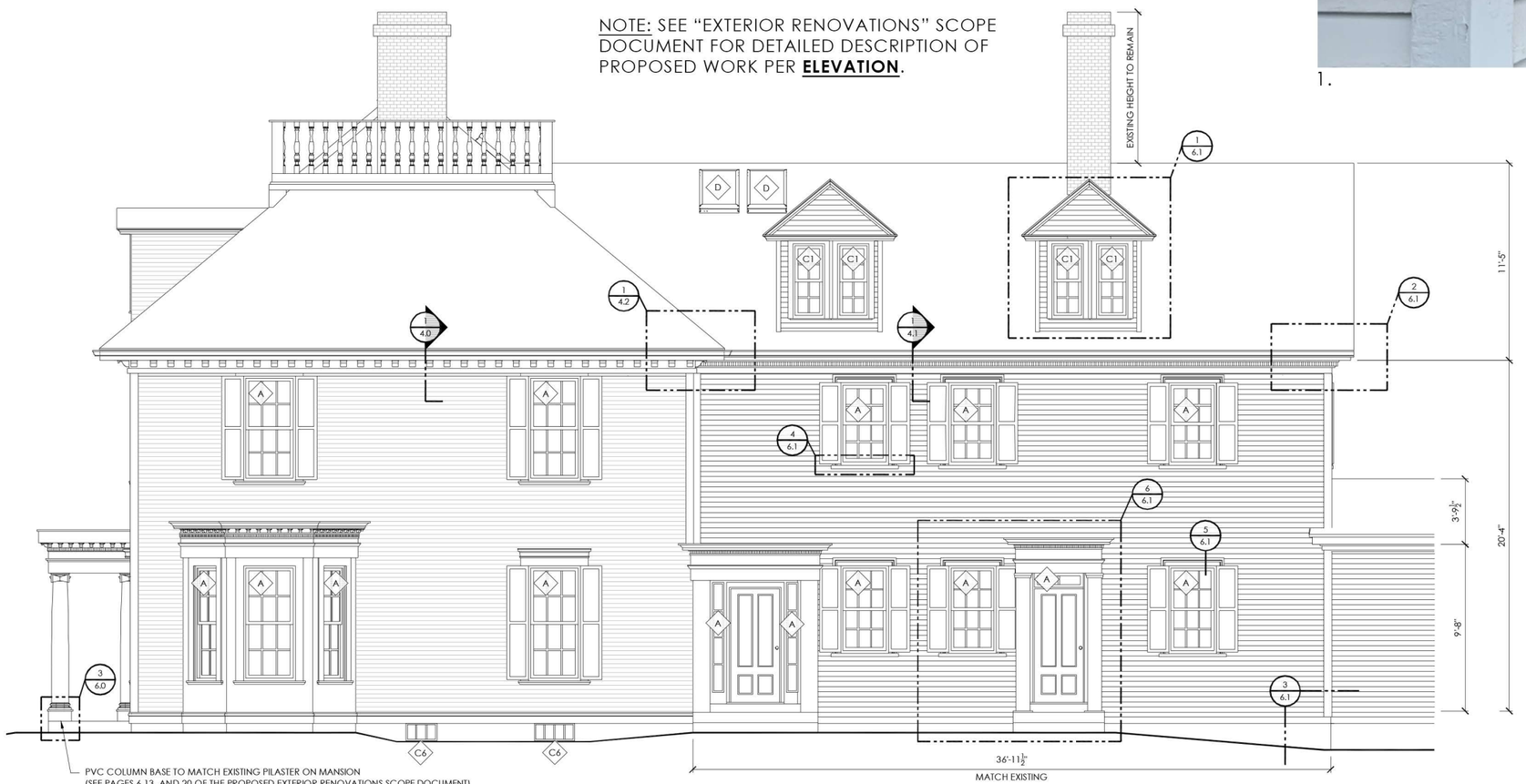
VIEW OF EXISTING SOUTH ELEVATION

1.



2.

NOTE: SEE "EXTERIOR RENOVATIONS" SCOPE DOCUMENT FOR DETAILED DESCRIPTION OF PROPOSED WORK PER **ELEVATION**.



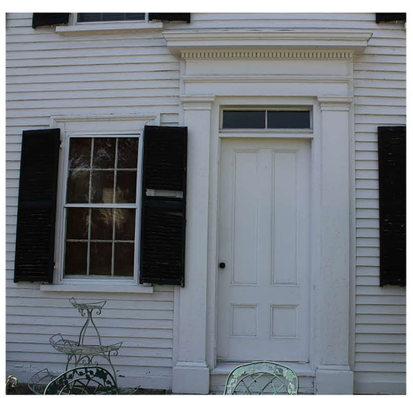
1 PROPOSED SOUTH ELEVATION

1/8" = 1'-0"

3.

4.

5.



6.

179 PLEASANT STREET

PORTSMOUTH, NEW HAMPSHIRE

PROPOSED SOUTH ELEVATION

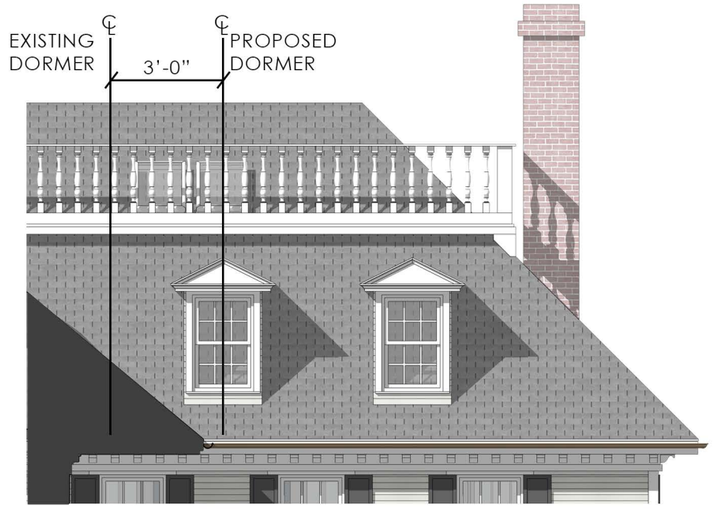
HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

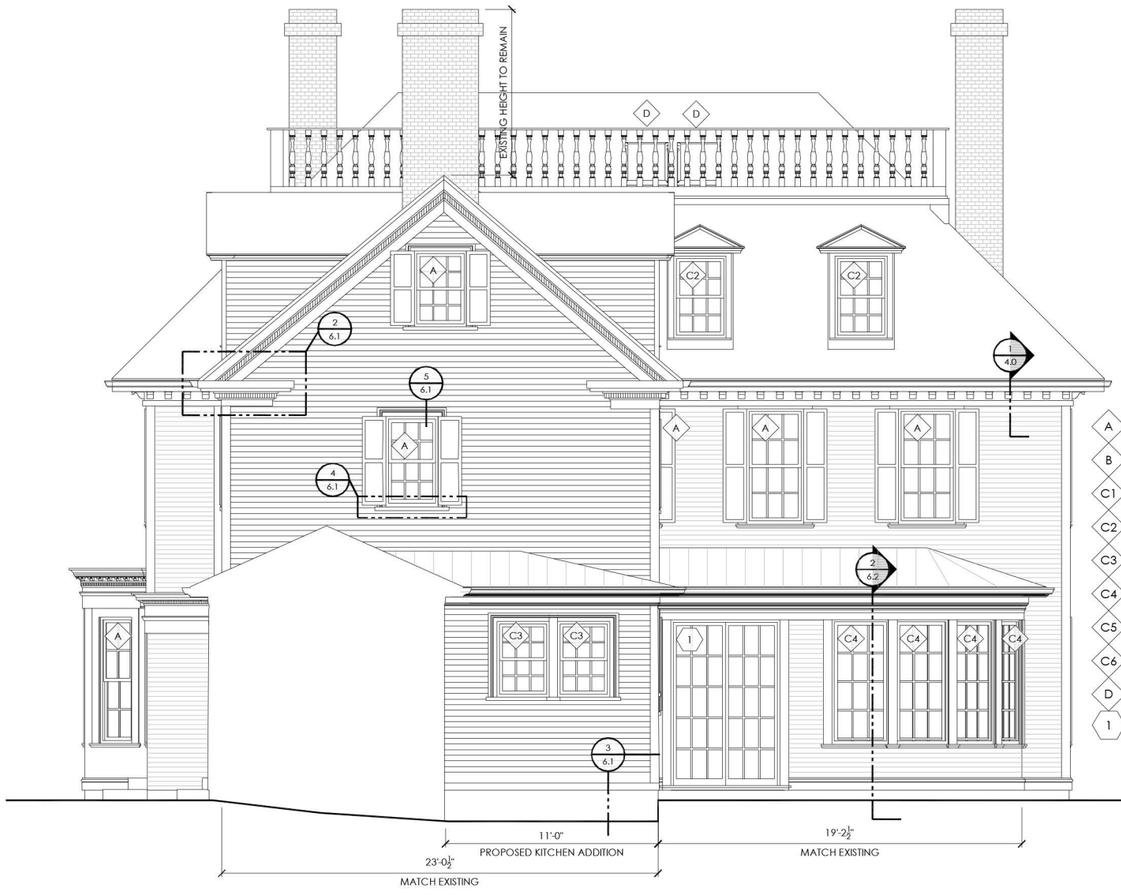
3.1

PREVIOUSLY APPROVED EAST ELEVATION (FOR REFERENCE)

VIEW OF EXISTING EAST ELEVATION



PROPOSED MANSION DORMERS - EAST ELEVATION



A WINDOWS TO BE RESTORED

B WINDOWS TO BE REPLICATED

C1 MARVIN WOOD ULTIMATE DOUBLE HUNG: 1'-10⅜" X 4'-5½" (UWDH 1622)

C2 MARVIN WOOD ULTIMATE DOUBLE HUNG: 2'-8⅜" X 4'-5½" (UWDH 2622)

C3 MARVIN WOOD ULTIMATE DOUBLE HUNG: 2'-8⅜" X 4'-1½" (UWDH 2620)

C4 MARVIN CLAD ULTIMATE CASEMENT: 3'-1" X 6'-5⅝" (UCA 3678 ET)

C5 MARVIN WOOD ULTIMATE DOUBLE HUNG: 2'-8⅜" X 5'-1½" (UWDH 2626)

C6 MARVIN CLAD ULTIMATE AWNING - SIZE TO MATCH WINDOW IN EXISTING FOUNDATION OPENING

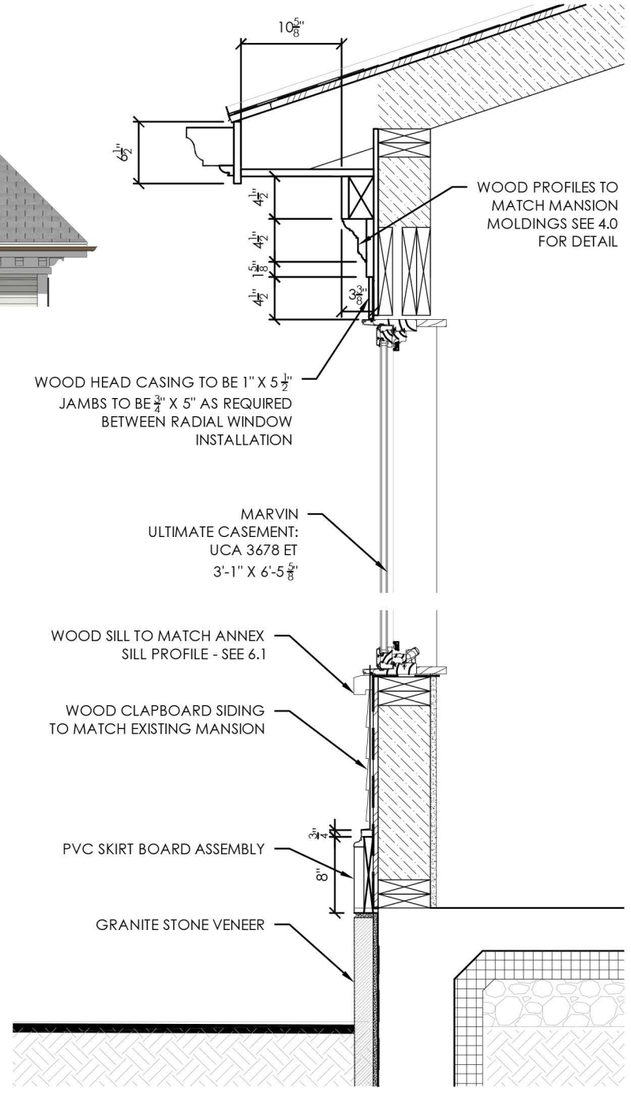
D VELUX SKYLIGHTS TO MATCH EXISTING SIZES

1 MARVIN ULTIMATE DOOR: 6'-0" X 8'-7" (UOFD CLAD)

NOTE: SEE "EXTERIOR RENOVATIONS" SCOPE DOCUMENT FOR DETAILED DESCRIPTION OF PROPOSED WORK PER **ELEVATION**.

1 PROPOSED EAST ELEVATION

1/8" = 1'-0"



2 PROPOSED WALL SECTION

3/4" = 1'-0"

179 PLEASANT STREET

PORTSMOUTH, NEW HAMPSHIRE

PROPOSED EAST ELEVATION

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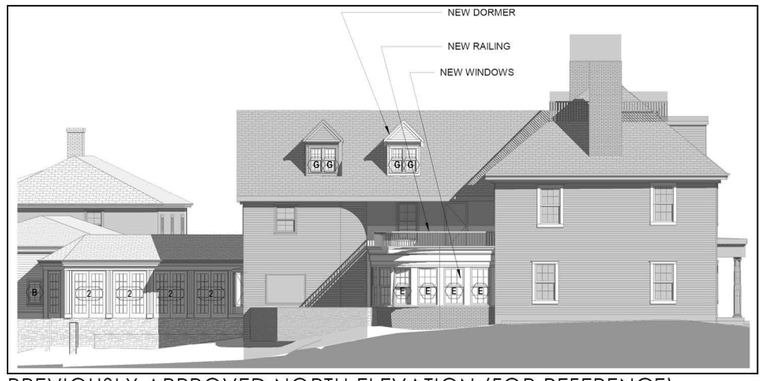


PREVIOUSLY APPROVED NORTH ELEVATION (FOR REFERENCE)

VIEW OF EXISTING NORTH EAST ELEVATION

VIEW OF EXISTING NORTH ELEVATION

1.

2.

3.

4.

NOTE: SEE "EXTERIOR RENOVATIONS" SCOPE DOCUMENT FOR DETAILED DESCRIPTION OF PROPOSED WORK PER **ELEVATION**.

1 PROPOSED NORTH ELEVATION

1/8" = 1'-0"

179 PLEASANT STREET

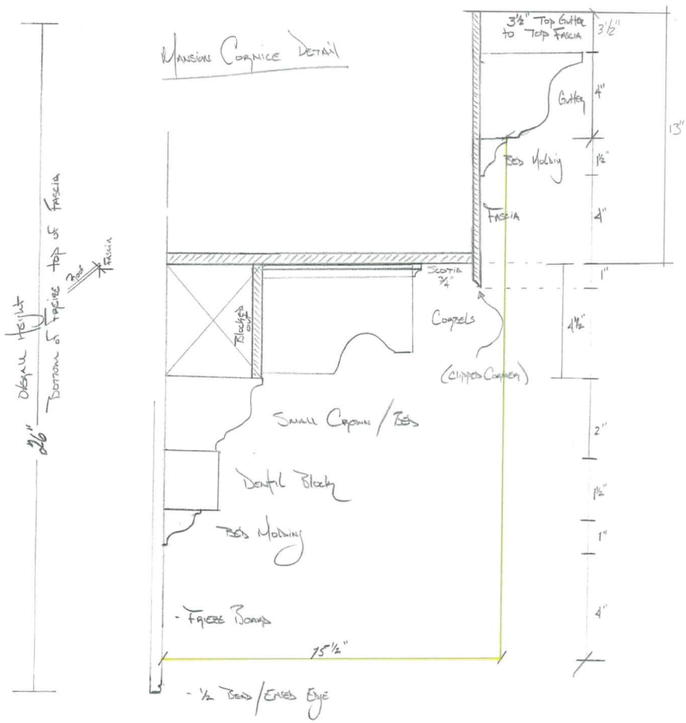
PORTSMOUTH, NEW HAMPSHIRE

PROPOSED NORTH ELEVATION

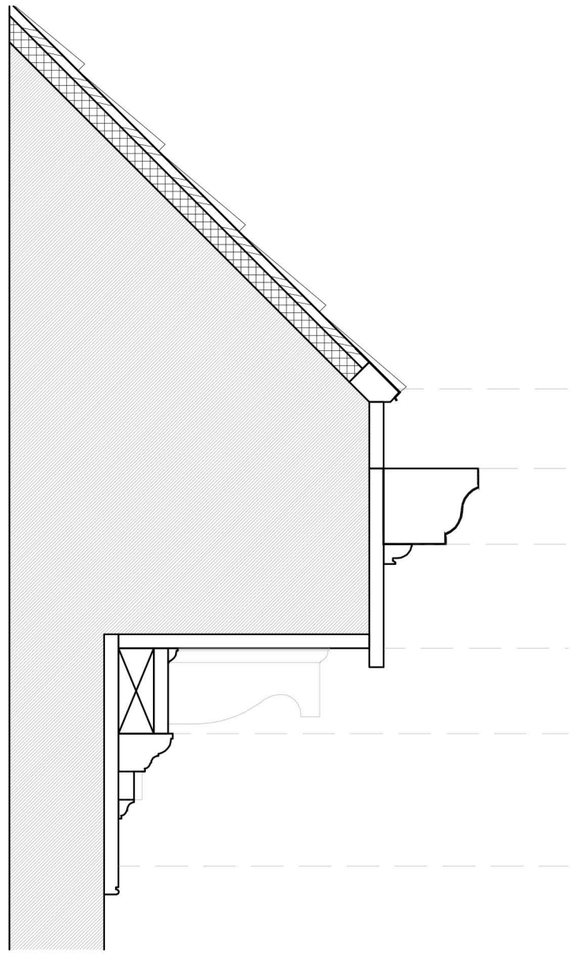
HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

3.3



EXISTING CORNICE DETAIL AND DIMENSIONS



VIEW OF EXISTING CORNICE

179 PLEASANT STREET

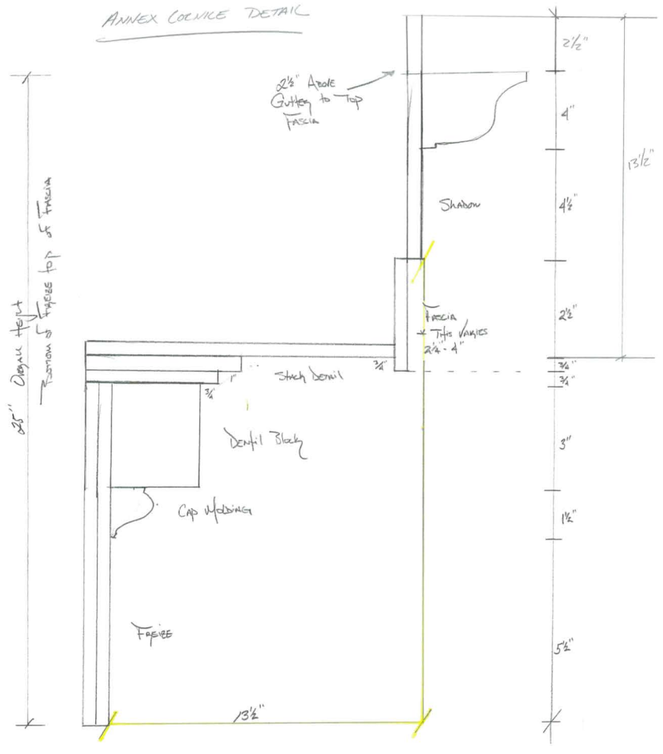
PORTSMOUTH, NEW HAMPSHIRE

MANSION CORNICE DETAIL

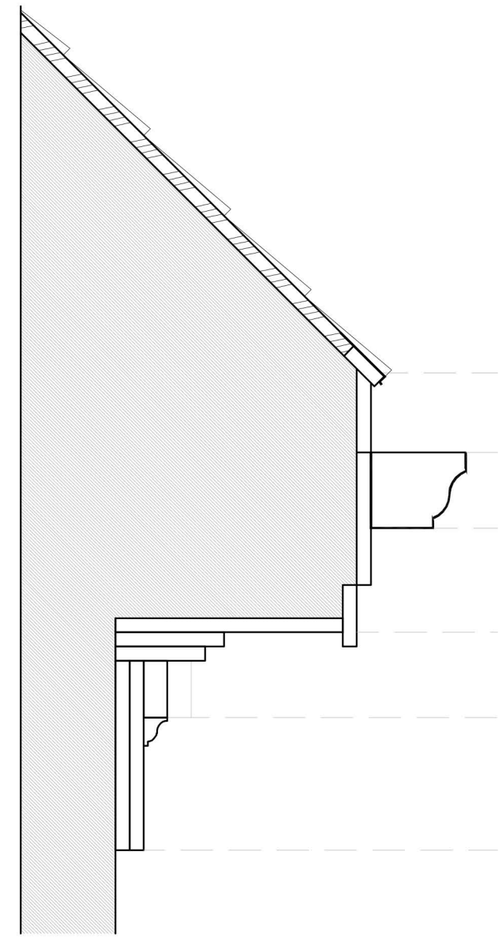
HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

4.0



EXISTING CORNICE DETAIL AND DIMENSIONS



VIEW OF EXISTING CORNICE

179 PLEASANT STREET

PORTSMOUTH, NEW HAMPSHIRE

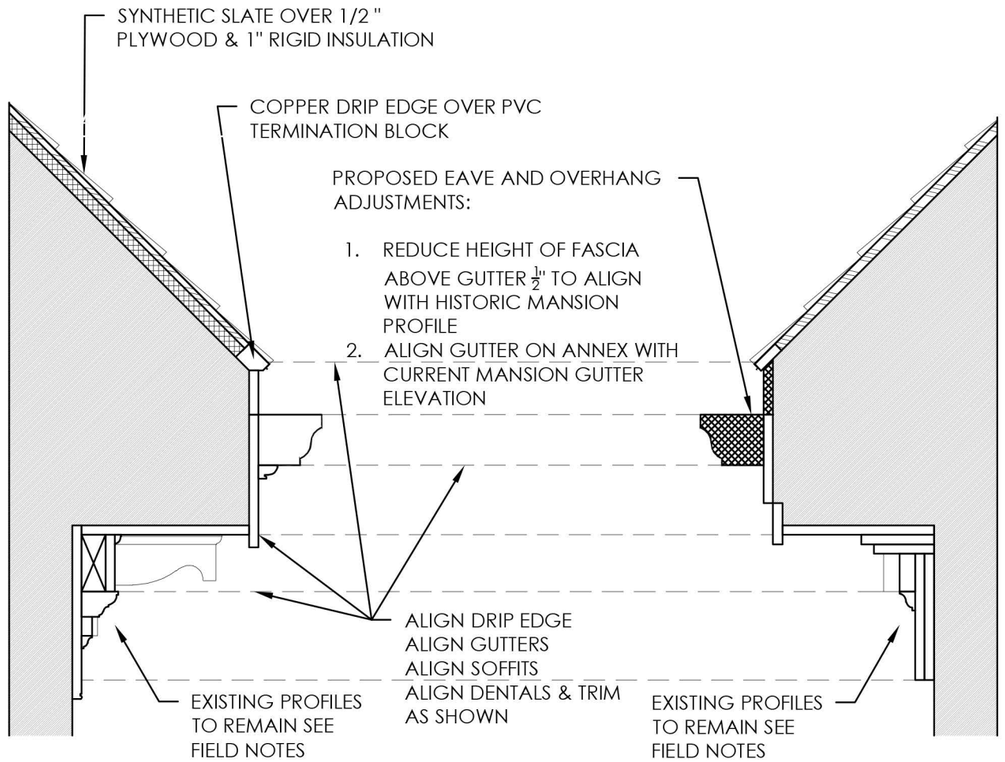
ANNEX CORNICE DETAIL

HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

MANSION EAVE

ANNEX EAVE



MANSION EAVE

ANNEX EAVE

3D VIEW OF PROPOSED CORNICE INTERSECTION

179 PLEASANT STREET

PORTSMOUTH, NEW HAMPSHIRE

PROPOSED CORNICE INTERSECTION DETAIL

HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

PREVIOUSLY APPROVED VIEW FROM SOUTH WEST

EXISTING VIEW FROM SOUTH WEST

PROPOSED VIEW FROM SOUTH WEST

179 PLEASANT STREET

PORTSMOUTH, NEW HAMPSHIRE

3D VIEW FROM SOUTH WEST

HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

5.0

PREVIOUSLY APPROVED VIEW FROM NORTH EAST

EXISTING VIEW FROM NORTH EAST

PROPOSED VIEW FROM NORTH

179 PLEASANT STREET

PORTSMOUTH, NEW HAMPSHIRE

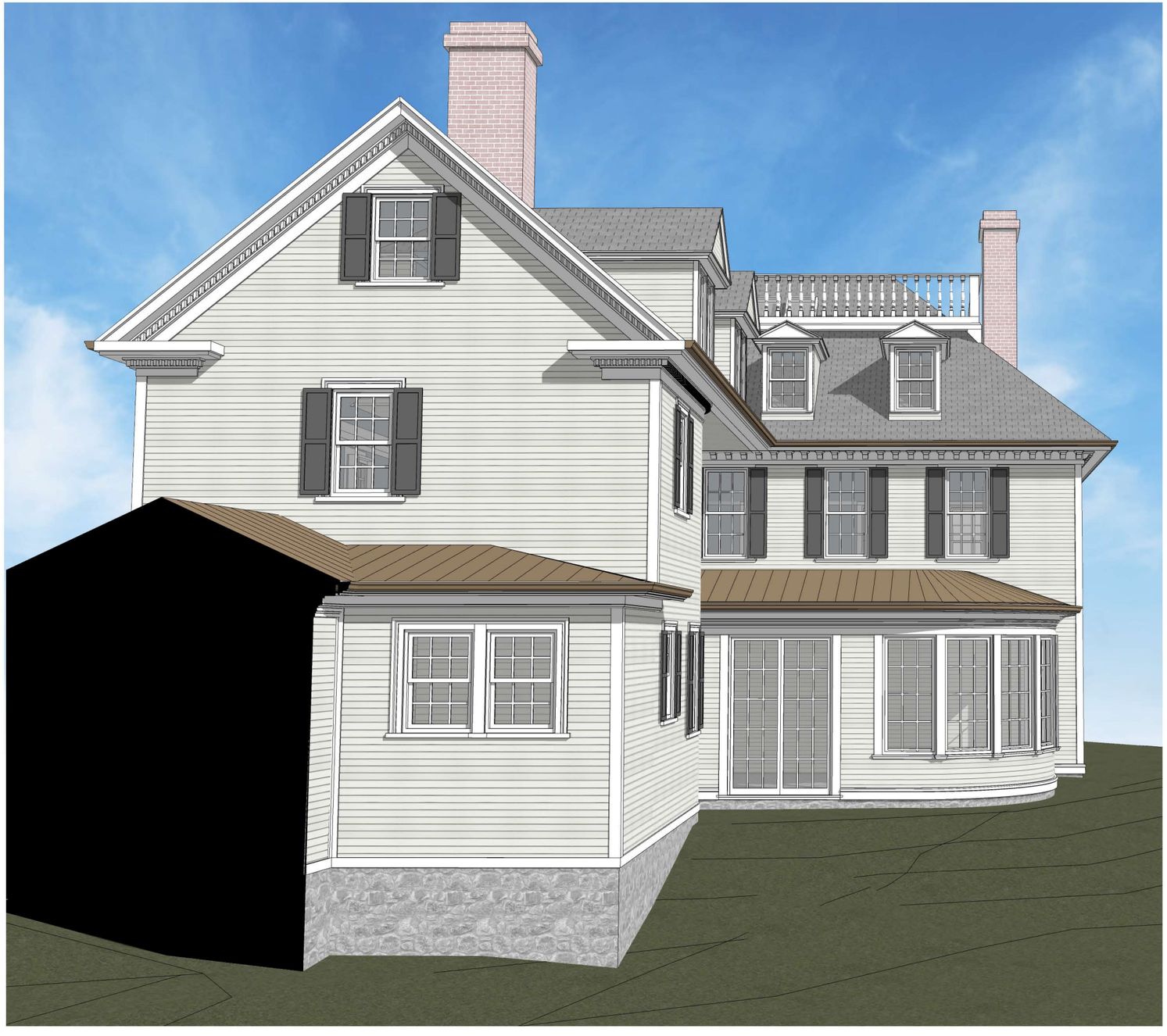
3D VIEW FROM NORTH

HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

PREVIOUSLY APPROVED VIEW FROM NORTH EAST

EXISTIGN VIEW FROM NORTH EAST



179 PLEASANT STREET

PORTSMOUTH, NEW HAMPSHIRE

3D VIEW FROM EAST

HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

EXISTING VIEW FROM NORTH WEST

PROPOSED VIEW FROM NORTH WEST

179 PLEASANT STREET

PORTSMOUTH, NEW HAMPSHIRE

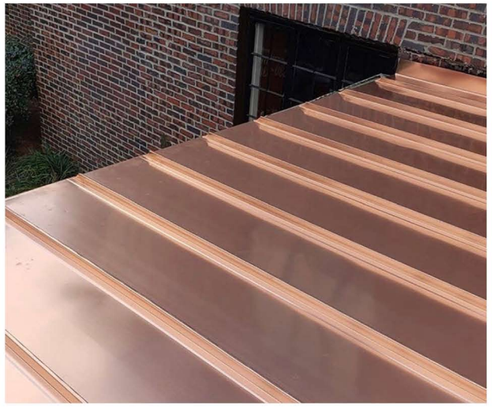
3D VIEW FROM NORTH WEST

HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

FLAT SEAM COPPER ROOF

MANUFACTURER: CUSTOM FABRICATED
STYLE: FLAT SEAM
MATERIAL: COPPER



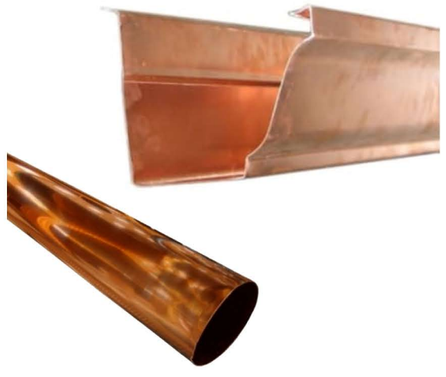
STANDING SEAM COPPER ROOF

MANUFACTURER: CUSTOM FABRICATED
STYLE: STANDING SEAM
MATERIAL: COPPER

BRAVA
ROOF TILE

SYNTHETIC SLATE ROOF

MANUFACTURER: BRAVA
STYLE: ARENDALE



GUTTER & DOWNSPOUT

MANUFACTURER: CUSTOM FABRICATED
STYLE: K-STYLE GUTTER W/ 3" SMOOTH DOWNSPOUT
MATERIAL: COPPER

SKYLIGHTS

MANUFACTURER: VELUX
STYLE: VENTING CURB MOUNTED (VCE)

179 PLEASANT STREET
PORTSMOUTH, NEW HAMPSHIRE

PROPOSED MATERIALS

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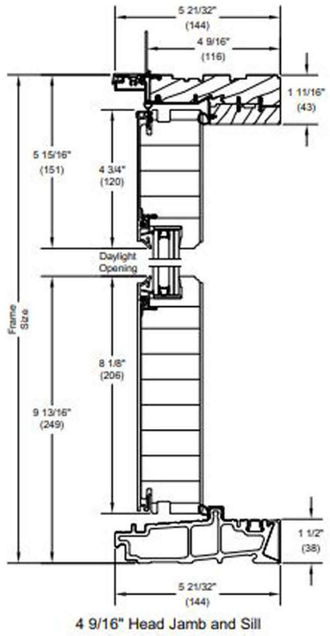
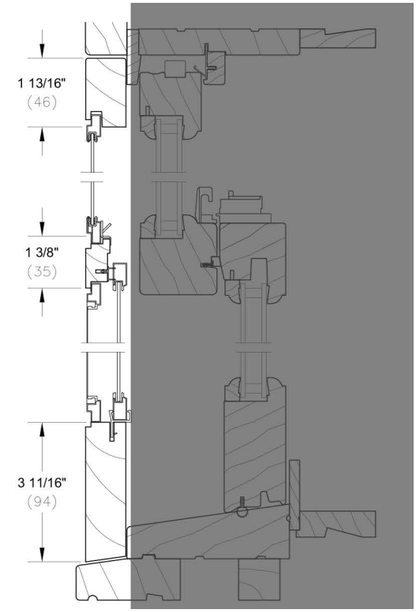
CJ ARCHITECTS

WINDOW SHUTTERS

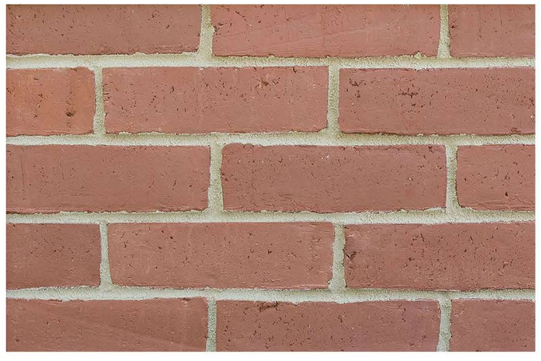
MANUFACTURER: BEECH RIVER MILL
STYLE: THE BEACON HILL STYLE
COLOR: MATCH EXISTING



4 9/16" Head Jamb and Sill



Head Jamb and Sill

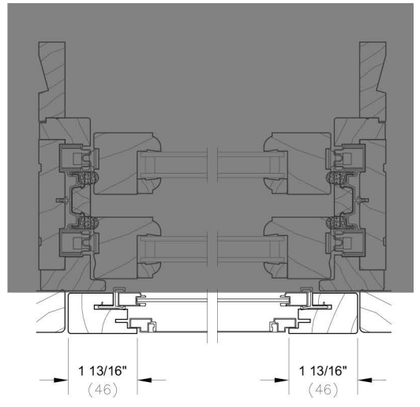


MASONRY BRICK

MANUFACTURER: MORIN BRICK
COLOR: COLONY RED WATERSTRUCK

DOOR

MANUFACTURER: MARVIN
STYLE: CLAD ULTIMATE



Jambs

STORM WINDOWS

MANUFACTURER: MARVIN
STYLE: WOOD

179 PLEASANT STREET
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PROPOSED MATERIALS

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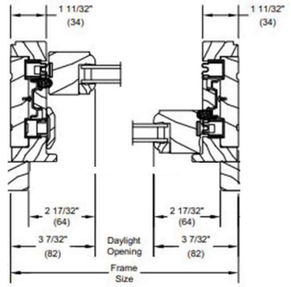
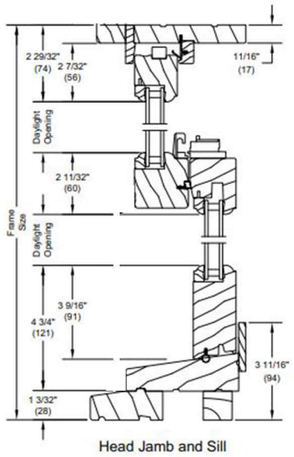


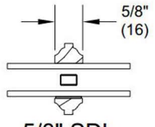
Jambs



Head Jamb and Sill

Features of the Ultimate Wood Double Hung Window

- Available in heights up to 8 feet or widths up to 4 feet
- Multiple design options and woods available to match historical aesthetics and design requirements

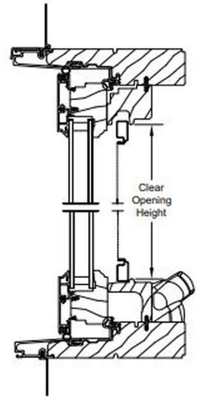


5/8" SDL
W/Spacer

DOUBLE HUNG WINDOWS

MANUFACTURER: MARVIN

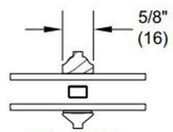
STYLE: WOOD ULTIMATE



Head Jamb and Sill

Features of the Clad Ultimate Casement and Awning Window

- Available in heights up to 8.5 feet or widths up to 3.5 feet
- Industry-leading range of size options
- Multi-point locking system ensures a tight seal and security from top to bottom



5/8" SDL
W/Spacer

CASEMENT WINDOWS

MANUFACTURER: MARVIN

STYLE: CLAD ULTIMATE

1. PARTIAL NORTH ELEVATION (RIGHT SIDE)

2. WEST ELEVATION (FRONT)

3. SOUTH ELEVATION (LEFT SIDE)

4. PARTIAL NORTH ELEVATION (RIGHT SIDE)

5. EAST ELEVATION (REAR)

6. PARTIAL NORTH ELEVATION (RIGHT SIDE)

179 PLEASANT STREET

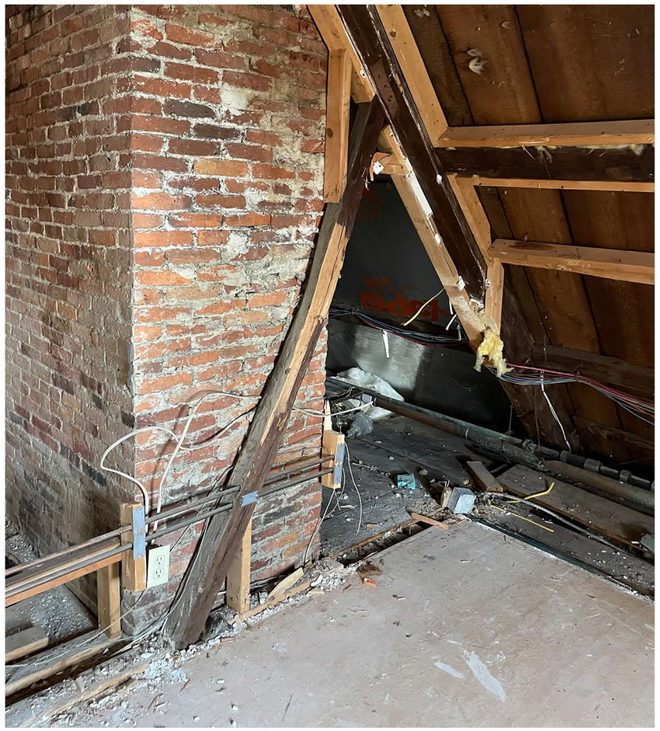
PORTSMOUTH, NEW HAMPSHIRE

EXISTING ELEVATIONS

HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

7.0



179 PLEASANT STREET

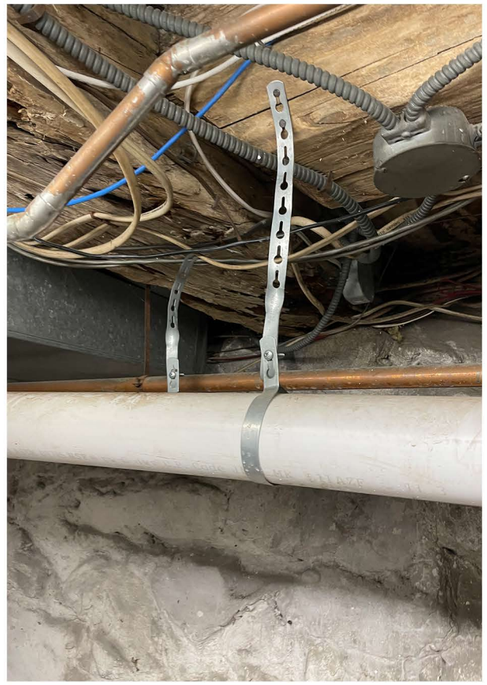
PORTSMOUTH, NEW HAMPSHIRE

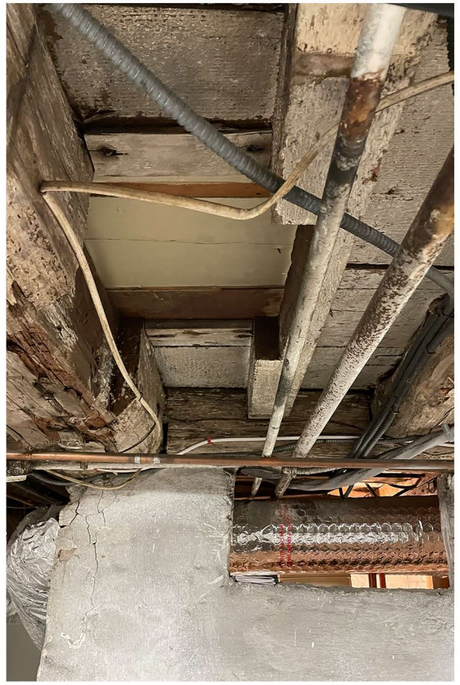
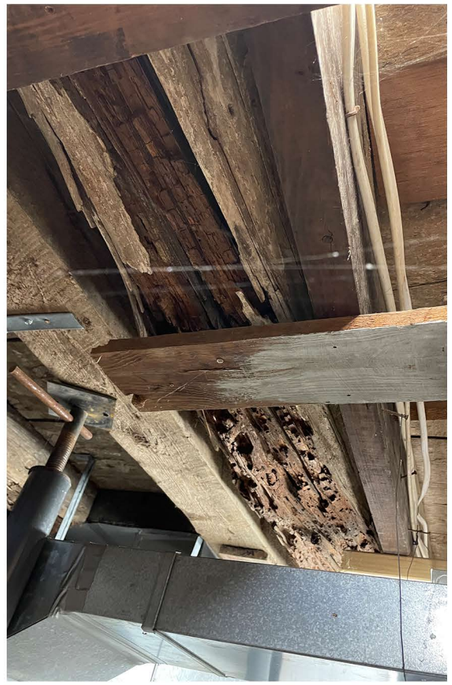
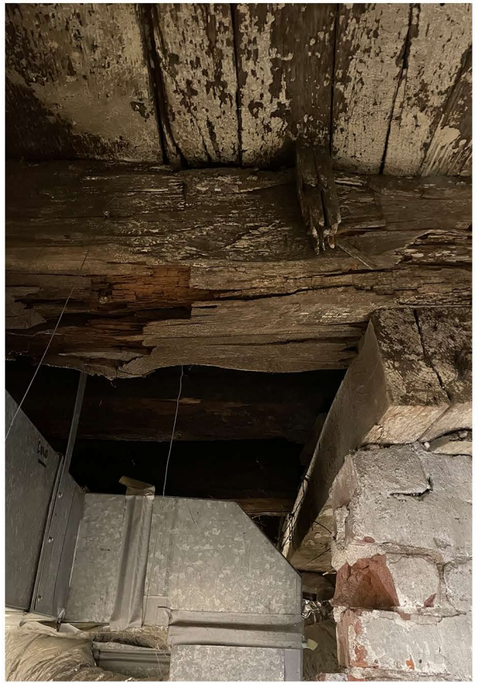
STRUCTURAL FINDINGS

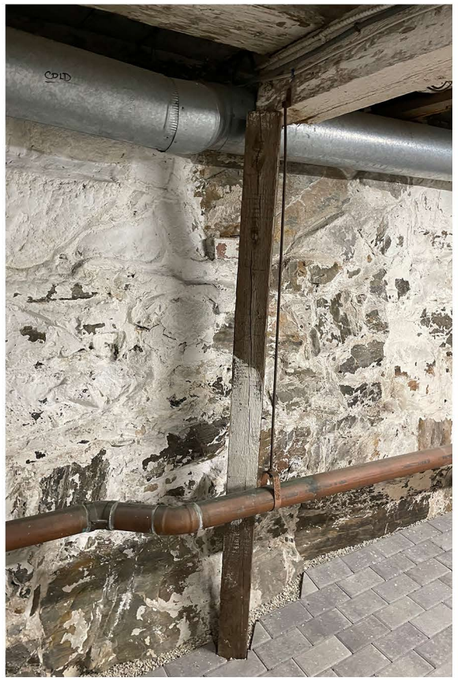
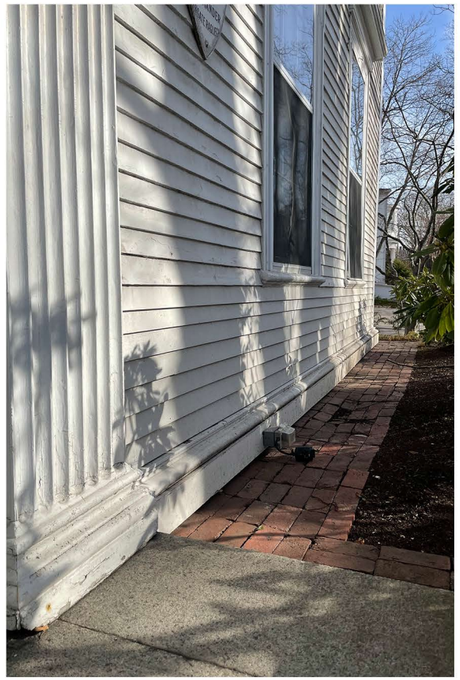
THIRD FLOOR -1988 MANSION RENOVATION

HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS



179 PLEASANT STREET

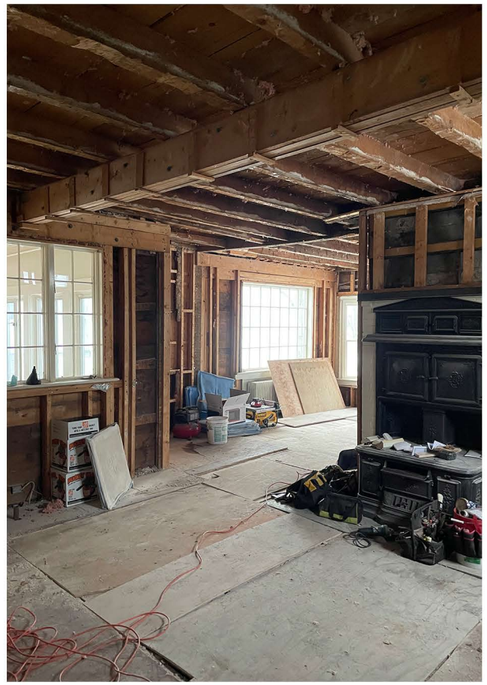
PORTSMOUTH, NEW HAMPSHIRE

STRUCTURAL FINDINGS

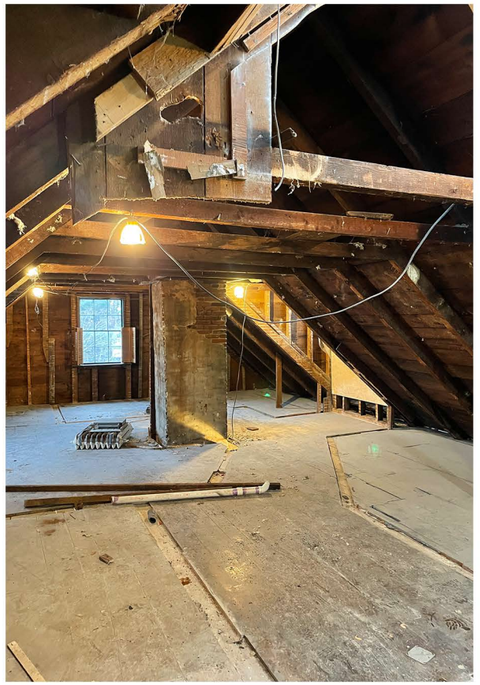
FIRST FLOOR STRUCTURE - MANSION

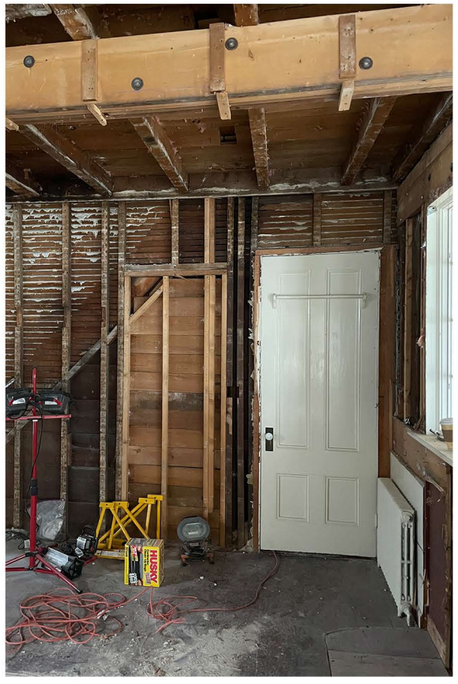
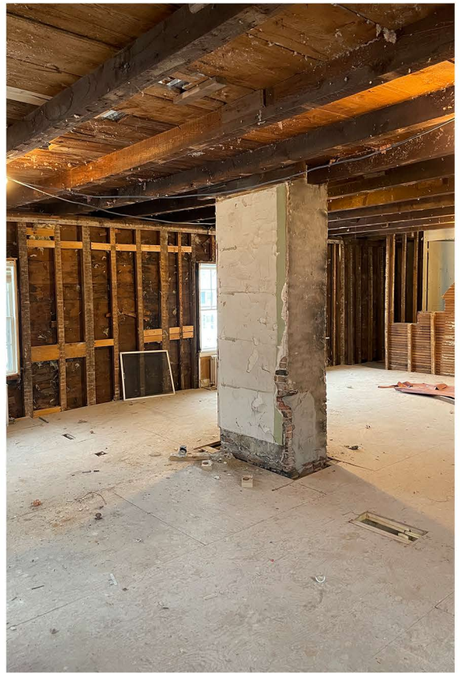
HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS







179 PLEASANT STREET

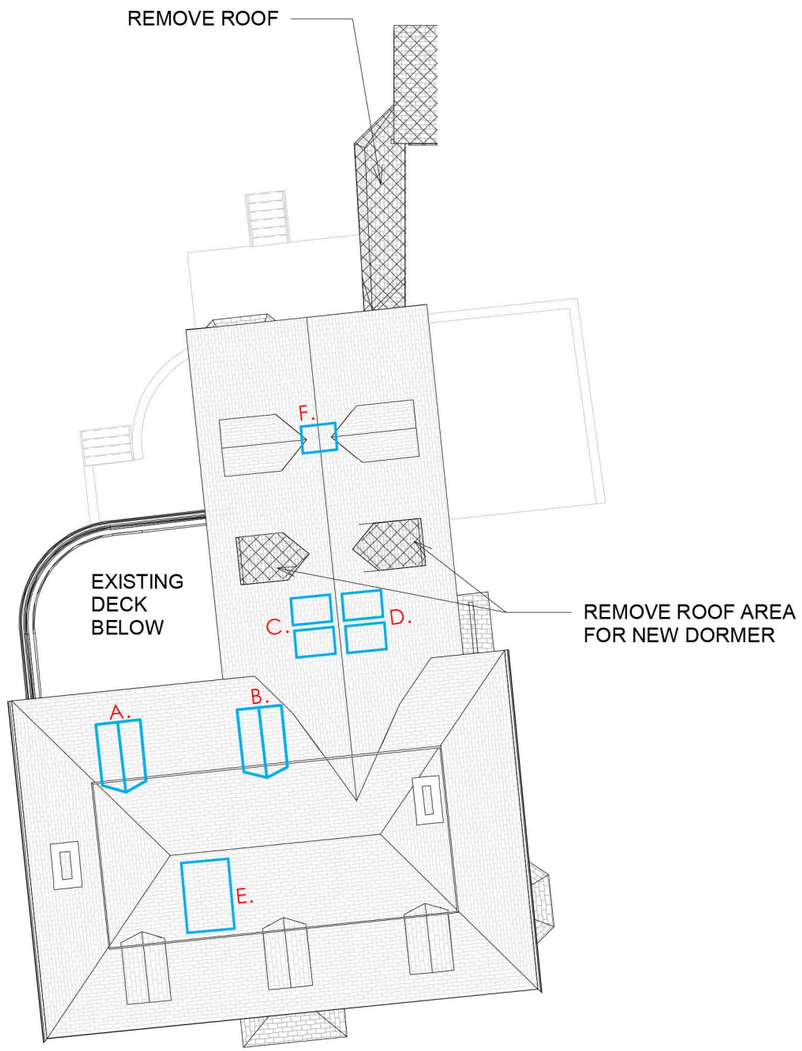
PORTSMOUTH, NEW HAMPSHIRE

STRUCTURAL FINDINGS

ALL FLOORS - ANNEX

HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS



ROOF PLAN - EXISTING (2019)

179 PLEASANT STREET

PORTSMOUTH, NEW HAMPSHIRE

EXISTING CONDITION FINDINGS

NOT SHOWN IN PREVIOUS APPROVAL DOCUMENTS

HDC APPLICATION TO AMEND PREVIOUS APPROVAL: MARCH 2, 2022

CJ ARCHITECTS

MANSION

SUMMARY OF WORK

South Elevation

“Main House” **“Annex”**

Main House:

- Chimneys (2 in total on the mansion)
  - Wash and clean both exterior surfaces and interior flues
  - Strip all paint off the chimneys by sponge jetting or chemical stripping if needed
  - Repair and repoint chimneys as needed
    - Mortar analysis and brick selection to be complete after paint is removed
    - Water struck brick to be used if any bricks require replacement
  - Insert stainless steel liners in both chimneys
    - (1) chimney will be wood burning, the other will be for gas venting
  - All chimneys to be returned to natural brick and water sealed
    - Sealer will be SaltGuard by Prosoco
- Widows Walk
  - Lift widows walk off the roof, this to be done as a complete unit or 4 pieces
  - Complete paint prep and rot restoration to be completed
  - Alter “back” elevation to accommodate raising of Annex ridge line
  - Complete paint job before reinstalling back on the roof in same configuration
  - Paint color to match siding and trim
    - A paint sample will be analyzed to match existing white

- Roof
  - Remove all slate roofing on the mansion to expose original sheathing
  - Remove all flashings and ridge and valley systems as well
  - Install 1" of polyisocyanurate rigid foam over existing roof sheathing
  - Install ¾ CDX plywood over rigid foam and screw into interior members
    - This work to be done in coordination with structural roof work on the interior
  - See roof edge detail to compensate for additional material thickness on roof
  - Install Grace Ice and Water shield and Triflex on the roof
  - Install new composite slate roofing on roof system of the mansion and annex
    - Brava composite slate roof tile to be installed
  - All flashings to be copper
- Gutters
  - Remove existing aluminum gutters and downspouts
  - Install new copper 4" K style gutters with 3" smooth round downspouts
  - All gutter downspouts to enter a perimeter drainage system
    - Perimeter drain explained further in grading and landscape section
  - All soffit trim pieces and fascia to remain and be restored prior to new gutter system
- Shutters
  - Shutters exist on the north and south walls of the mansion and annex
  - Remove all shutters, review condition & material used for construction
  - Complete paint prep and rot restoration on shutters not damaged beyond repair
  - Build new custom shutters to the same spec for any damaged beyond repair
  - Beech River Millworks to provide custom shutters out of Spanish cedar
  - Final paint job on all repaired and new shutters
    - A paint sample will be analyzed to match the existing black
- Windows/Storms
  - All original windows in the mansion to remain and be restored
    - The only exception are the dormer windows, to be explained in dormer section
  - Each sash to be removed, reglazed, completely prepped, and painted
  - Where glass panels need to be replaced, historic glass will be installed
    - There is a small handful, but most are in good condition
  - Each window to receive new sash chains, weights, and weather stripping
  - Custom wooden storm windows to be installed on the exterior
    - Storms to be built by Marvin and specs are attached
    - Paint color will match sample provided for siding and trim
  - Storm windows will be seasonal and incorporate the following
    - Full storm with simulated check rail (exterior mounted)
    - ½ screen for warmer months (exterior mounted)
    - The storm and screen will be separate units
  - All window work to be completed by Window Woman of NE

- Siding & Trim
    - All siding and trim paint to be removed down to original wood
        - Sponge jet, scrap, heat, strip, will need to define method
    - Repairs or replacements will be made with wood and in kind as needed
        - There are several repairs/replacements needed throughout the mansion
        - Trim will be made with the exact profile where needed
        - Siding lap joints will be recreated where needed
        - Please see supporting pics on page 9
    - Remove bottom 18" of siding and trim on all sides of the mansion
        - Remove all siding, trim, and sheathing so sill beam rot can be addressed
        - Install new wooden siding in kind and same dimensions as original
        - If possible, install original shirt board back on the mansion
        - If skirt board can't be salvaged a new one will be milled to exact profile
- Bay Window
    - Bay window to receive same treatment as described above in window, siding, &trim
    - Remove the existing copper flat seamed roof
    - Install framing to create a minimal pitch away from the house
        - Currently has a negative pitch due to settling
        - Water is sitting against the exterior and extensive rot has occurred
    - Install flat seam copper roof
        - See attached picture
    - Review CMU block foundation under bay window
        - We have discovered the CMU blocks are 1 course below grade
        - We will install a new frost wall under the bay window
    - Veneer foundation walls with stone to look like main foundation
        - Sample of veneer stone supplied
        - Picture of existing stone supplied as well
- Utility & Building Penetrations
    - Relocate & address all utility and venting penetrations on the building
    - Hide or disguise as much as possible
    - *This will be expanded upon in "phase 2" with exterior lighting and hardware*
- Basement Windows
    - Replace all basement windows with new cladded windows
    - Basement windows to be 4 light as existing window and venting
    - Requesting a cladded window because they are located at grade
    - See pictures showing basement window light cut
- Grading &Landscaping
    - During construction we would like to dig down around foundation of main house
        - The depth of this trench to be defined but would like 24" min below grade
    - Infill trench with positive draining soils
    - Install brick drip edge around the perimeter of the house as currently installed
        - Drip edge not to exceed top of wall in elevation
        - Currently installed at top of sill
        - Only appearance change should be more exposed rubble foundation

West Elevation

Main House:

The proposed project scope as noted on the "South Elevation" will also apply to the west elevation or the front of the house. The additional items proposed for the west elevation are as follows:

- Dormers
  - All (3) dormers will remain
  - Dormers to receive same proposed treatment as described in siding & trim section
  - Dormer windows will however be reproductions produced by Window Woman of NE
    - Reproductions to match original windows in the rest of the house
    - Current windows are vinyl jamb wood sash, not original
- Window Head Casings
  - The head casings on the 1st floor windows show signs of water infiltration and rot
  - Remove 2 courses of siding above the head units to properly flash
    - All flashings will be copper
  - We will restore the trim wherever possible
  - If the trim is beyond restoring, an exact replicated head casing will be made in wood
  - New wood siding or salvaged siding to be installed after flashing has been corrected
  - See pictures for head flashing issues

- Main Entry Portico
    - Portico to receive same treatment as described above in siding & trim section
    - Remove the existing copper flat seam roof on the portico
    - Remove (2) courses of siding above the portico so appropriate flashing can be installed
    - Install a new flat seam copper roof and flashing on portico
        - See attached picture for flat seam copper
    - Remove existing column bases
        - See attached pictures for detail
        - Bases are wooden boxes most likely hiding rotted column bases
    - Install new ionic style bases to match the profile of the pilaster bases on the portico
        - See attached pictures for profile and dimensions
    - I would like to replace the column and pilaster bases with exact replicated bases
    - New column and pilaster bases to be made from solid PVC
        - See attached picture for example of how base will be produced
        - It is not an example of exact dimension and style

North Elevation

Main House:

The proposed project scope as noted on the "South Elevation" will also apply to the north elevation of the house. The additional items proposed for the north elevation are as follows:

- Siding & Trim
  - Remove all siding on this side of the house to expose sheathing
    - There is a large bow in the center of the wall
    - Significant water infiltration visible on both exterior and interior surfaces
    - Concerns for health of the wall system and chimney, which correlates with the bow in the wall mid-span
  - All siding removed will try to be salvaged and reused for repairs on other walls
  - Trim, casings, cornice will all remain intact
  - Sheathing may need to be removed in some areas but wall system to remain in place
- Window Head Casings
  - The head casings on the 1st floor windows show signs of water infiltration and rot
  - Remove 2 courses of siding above the head units to properly flash
    - All flashings will be copper
  - We will restore the trim wherever possible
  - If the trim is beyond restoring, an exact replicated head casing will be made in wood
  - New wood siding or salvaged siding to be installed after flashing has been corrected
  - See pictures for head flashing issues

East Elevation

“Annex” **“Main House”** **“Sunroom”**

Main House:

The proposed project scope as noted on the “South Elevation” will also apply to the east elevation of the house. The additional items proposed for the east elevation are as follows:

- Dormers
  - The dormer closest to the “annex” roofline and valley to be relocated
    - This dormer is severely structurally compromised
    - See pictures on architectural plans
    - The dormer needs to move horizontally 3’ to allow the raising of the annex roofline as described in the south elevation scope
    - Refer to proposed elevation in architectural drawings
  - Dormers to receive same proposed treatment as described in the siding and trim section
  - Dormer windows will however be replaced with Marvin Ultimate windows
    - Current windows are vinyl jamb wood sash, not original
- Ceremonial Stair Window
  - Once the annex has been raised, we will reinstate the center stair window
  - Trim and siding will need to be added around this window
  - The top 1/3rd of the window is currently buried in the annex attic
  - Any new trim or siding will be made to exact profiles and dimensions
  - Stair window to receive same proposed scope as defined in window/storm section

ANNEX & SUNROOM

SUMMARY OF WORK

Sunroom:

- The sunroom will be removed completely
- Remove the roof system, all walls, foundation, slab, and footings in its entirety
- We are not saving or salvaging any material from this structure
    - The structure was added in the 1980's
- A new sunroom will be built to the same size as detailed in the architectural plans
- The sunroom will have a new foundation with veneered walls to match main house
    - The veneer will be the same as submitted and approved for the bay window
- Please refer to architectural plans for design and details
- Benchmarks will be established prior to demolition to ensure elevations and sizing are recreated accurately

Annex:

- Cut entry portico free and leave standing while the rest of the annex is removed
- Historic architectural elements to be saved and reused are as follows:
    - (11) windows
    - Shutters as explained in shutter scope above
    - Cornice molding
    - Door pediment, transom, and door
    - Entry portico
- Remove annex structure down to foundation walls, including
    - Angled bay
    - Pressure treated deck system
    - Bulkhead
    - Chimney
- Original kitchen ell foundation walls to remain
- Portico foundation will need to be reviewed at this time
- The original rubble foundation does not go under the portico
- The foundation wall supporting the portico and bulkhead has been compromised
    - See page 2 and 9 on the structural report for orientation
- The remaining annex foundation walls will be removed completely, to include footings
    - See page 9 of structural report for illustration of foundation walls
- Pour new concrete walls in same location as original annex walls
    - New concrete walls to receive a stone veneer same as described in bay window section
- Construct the new "annex" in the same footprint
    - See architectural drawings for footprint of new annex
    - Single story box bay to replace angled bay per drawings
- The height of the new annex will be lifted 31.5" so floors and soffits align
- The ridge of the annex will be lower than the main house
- See attached detail illustrating the soffit connection and massing
- New dormer windows to be Marvin Ultimate per spec attached
- Chimney to be reconstructed in kind
    - Water struck bricks to be used for reconstruction
    - Mortar to be the same as proposed in "mansion" write up for chimneys
    - Chimney cap detail and dentil to be reconstructed as documented
- Benchmarks will be established prior to demolition to ensure elevations and sizing are recreated accurately

Supporting Pictures

Siding & Trim repair/replacement

Siding & Trim repair/replacement

Supporting Pictures

North wall with water issues, cornice repair

North wall with water issues, significant bow in wall

Supporting Pictures

Main entry portico column base

Main entry pilaster base

Supporting Pictures

Bricks and grade at or above sill beam, promoting rot

Supporting Pictures

Basement window

Utility

Supporting Pictures

Dormer window

Supporting Pictures

Main entry portico roof

Window head unit flashing

Supporting Pictures

Annex chimney

Supporting Pictures

Annex chimney cap detail

Supporting Pictures

Proposed column and pilaster base construction. This is to only illustrate how the new bases will be made. 1-piece solid PVC

Existing foundation stone, square and rectangular granite slabs

21 January 2022

Structural Condition Assessment - Annex
Captain Thomas Thompson House
179 Pleasant Street
Portsmouth, New Hampshire

Gorham Structural Engineering, PLLC is a consultant to the property owner and has been retained to work with project architect, CJ Architects, to provide a conditions assessment of the building structure at 179 Pleasant Street. The following is a summary of the findings from the conditions assessment for the annex.

General Description

The Captain Thomas Thompson House is a two story wood framed hip-roofed mansion that was built in 1784. An ell known as the annex extends off the back of the original building and was built around 1860. The overall dimensions of the annex are approximately 22’-9”x30’-0”.

Exterior

On the exterior, the building’s foundation, siding, windows, roofing and chimneys are all in need of maintenance.

Annex south elevation

Annex east elevation

Annex north elevation

Side entry foundation detail view

Bulkhead detail view

East wall foundation with access panel

Foundation

The annex is supported a combination of brick and stone foundations with three distinctly different areas. See SK1 attached. From the back wall of the mansion, a full depth stone foundation extends east 14'-6" (±). The next area is inaccessible with a shallow stone perimeter foundation wall and an exposed earth floor extending east 10'-8" (±). The third foundation area is constructed of brick over stone masonry perimeter wall enclosing a low clearance crawl space with an exposed earth floor extending east 11'-9" (±).

The full-height stone foundation wall along the side entrance appears to be bowing inward with numerous cracks in the mortar joints. This is most likely due to the surcharge force

from the side entrance foundation, which is in visibly poor condition and in need of repair or replacement. Further investigation of this area is recommended.

The brick and stone foundation is in poor condition with eroded mortar joints and some wall areas visibly leaning out of plumb. My opinion is that the crawl space foundations will require significant repair.

First Floor Framing

The annex first floor framing is a combination of heavy timber, wood framing in direct contact with soil, and timber joists over a crawl space. See SK2 attached. My opinion is that the first floor framing, over the crawl space areas, is in poor condition and may need to be removed to provide access to the crawl space so the foundation can be repaired, for the installation of a proper vapor barrier, and to install new MEP systems.

First floor transition at full foundation

First floor near chimney/hearth

First Floor Wall Framing

The first floor exterior wall framing appears to have been modified numerous times over the life of the building. Some areas which look original are framed with 3x3 studs spaced at 30” on center with 2x2 infill studs and sloped furring. In other areas, it appears that new windows were installed and significant, but structurally dubious, framing modifications have been made. Significant repairs have been made at the curved wall.

3x3 and 2x2 first floor wall framing

Curved wall framing

Wall framing at window

Wall framing at window

Second Floor Framing

The second floor is framed using 3”x5½” joists spaced at 24” on center. See SK3 attached. The joists are supported at a (4)2x10 beam spanning 18-feet and a 3½”x7” beam which is supported at the chimney. Both beams are significantly overstressed. A number of the joists have been notched, drilled, or otherwise damaged to an extent that they have no tangible structural value. It was observed that one ply of the (4)2x10 beam is fractured. Assuming Hem-Fir material, the allowable total load for this floor system would be less than 5 psf. This floor must be considered unsafe in current condition and will require significant reinforcing or replacement.

Second floor joist

Second floor joist

(4)2x10 beam at supporting second floor

3”x7½” beam supporting second floor

Second Floor Wall Framing

The second floor exterior walls are constructed using 3”x4” studs spaced at 32” on center and are in good condition.

View of second floor wall framing

Curved wall framing as second floor

Third Floor Framing

The third floor is framed using 4”x5¾” wood joists spaced at 32” on center. See SK4 attached. Assuming Hem-Fir material, the allowable total load for this floor system would be approximately 10 psf. Joists are supported at the chimney and some joists are lacking adequate support, which are conditions that will need to be corrected.

Third floor framing supported at chimney

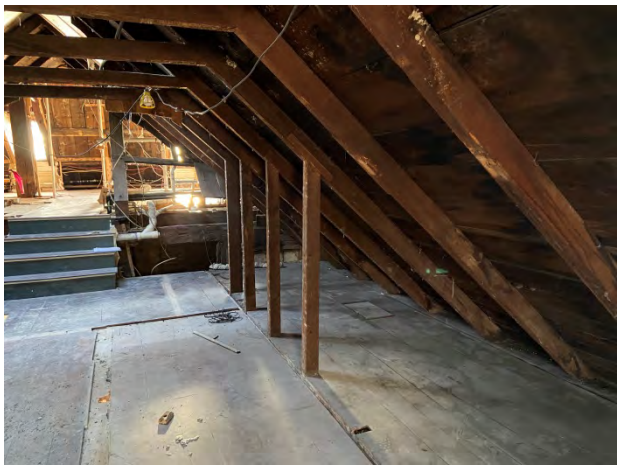
Annex third floor unsupported framing

Roof / Attic

The annex roof is framed using 2¾”x4¾” rafters spaced at 32” on center with 3”x4” collar beams located about 7-feet above the floor. The large roof overhang along the north side is partially supported by vertical struts, aligned with the exterior wall below, and extending to the underside of the rafters. Some of the gable wall framing is spliced. Assuming Hem-Fir material, the allowable total load for this roof system would be approximately 20 psf. The roof will require significant reinforcing or replacement to increase load capacity.

Roof framing at dormer

Gable wall framing



Vertical struts at curved wall and overhang

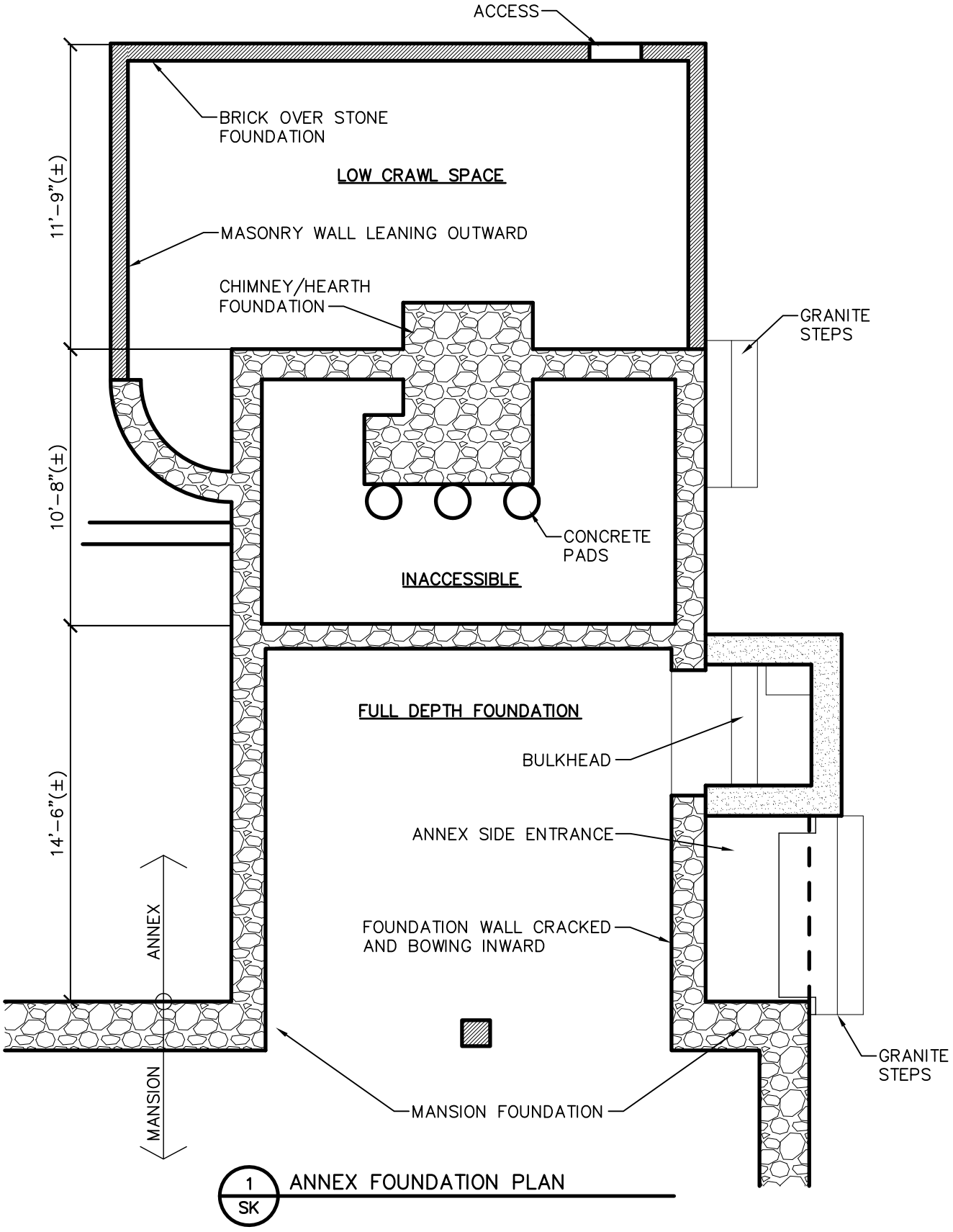
Roof framing looking toward Mansion

Conclusion

In my opinion, the annex framing is far too undersized, damaged, and compromised to be considered acceptable and safe for any current occupancy or use. The annex will require a significant commitment from the owner to provide the structural improvements needed to ensure that the building is safe and can remain in service in the future.

Respectfully submitted,
Martin Gorham, PE, LEED-AP, SECB

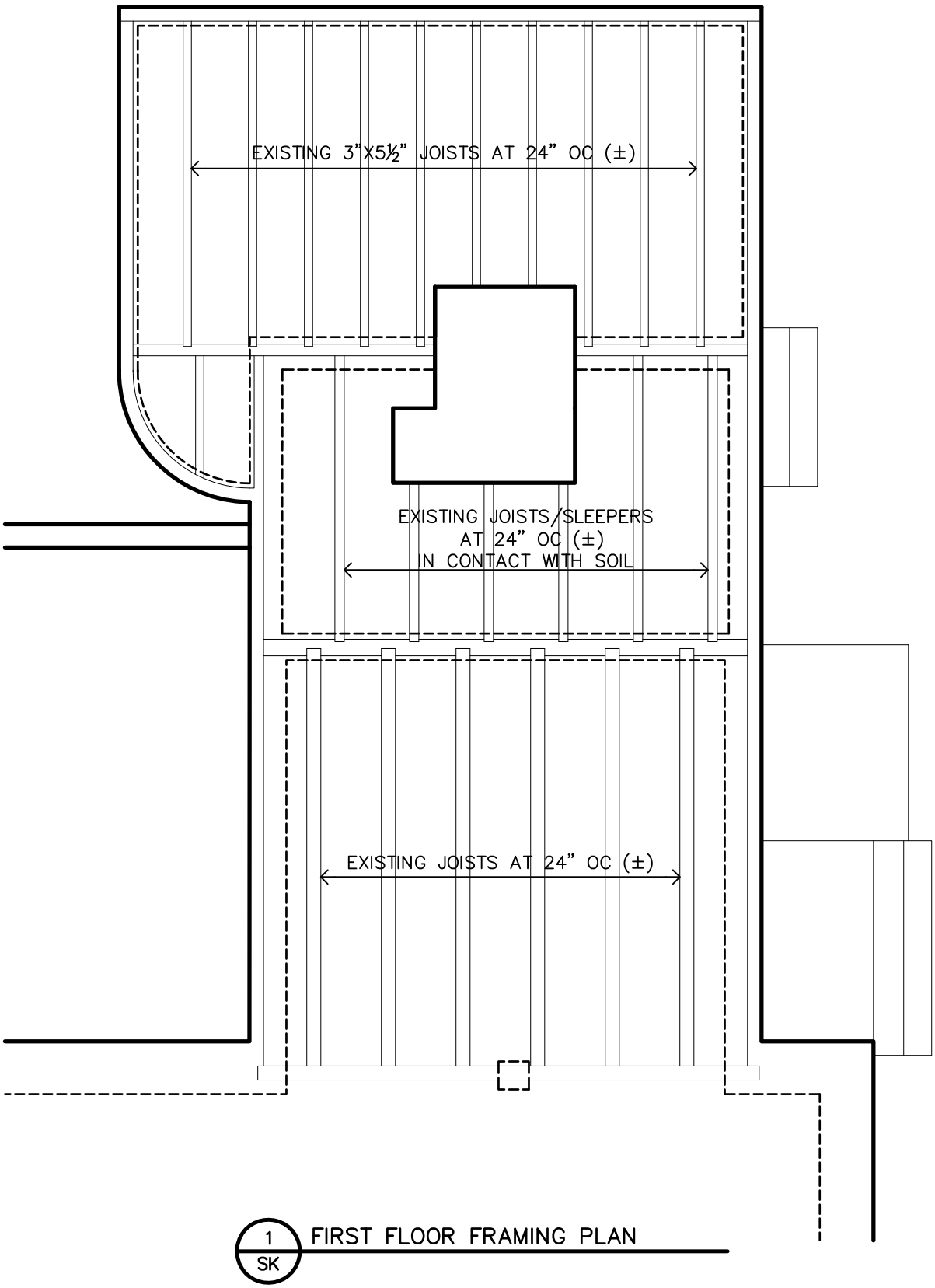
Attachments: SK1, SK2, SK3, SK4 & SK5



GORHAM STRUCTURAL
11 Burnham Avenue, Durham NH 03824
603-988-1738

179 Pleasant Street
Portsmouth, New Hampshire

Date: 1-21-2022	Affected Document: NA
Revision:	Sheet Number: SK1

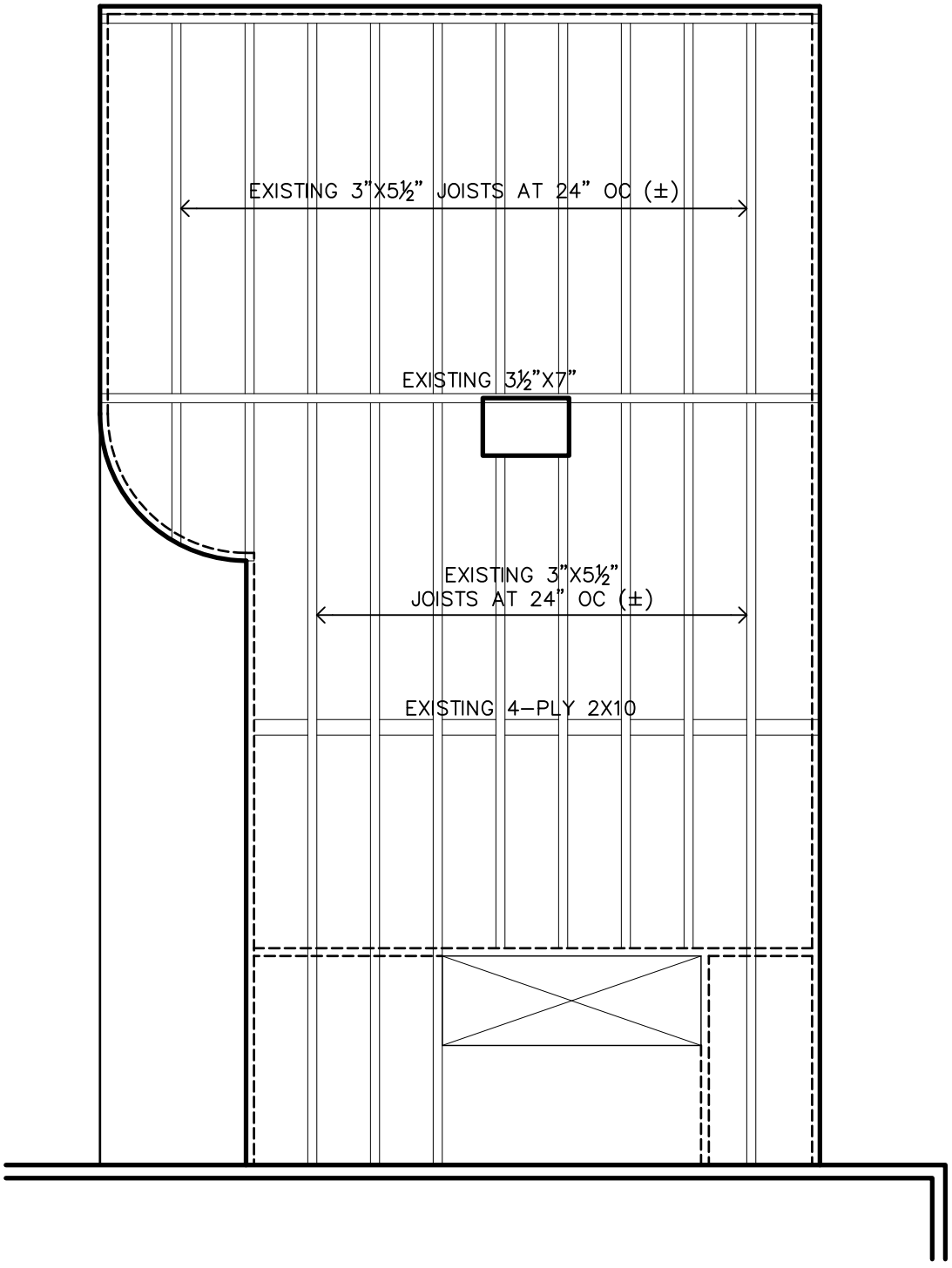


1/SK FIRST FLOOR FRAMING PLAN

GORHAM STRUCTURAL
11 Burnham Avenue, Durham NH 03824
603-988-1738

179 Pleasant Street
Portsmouth, New Hampshire

Date: 1-21-2022	Affected Document: NA
Revision:	Sheet Number: SK2



1/SK SECOND FLOOR FRAMING PLAN

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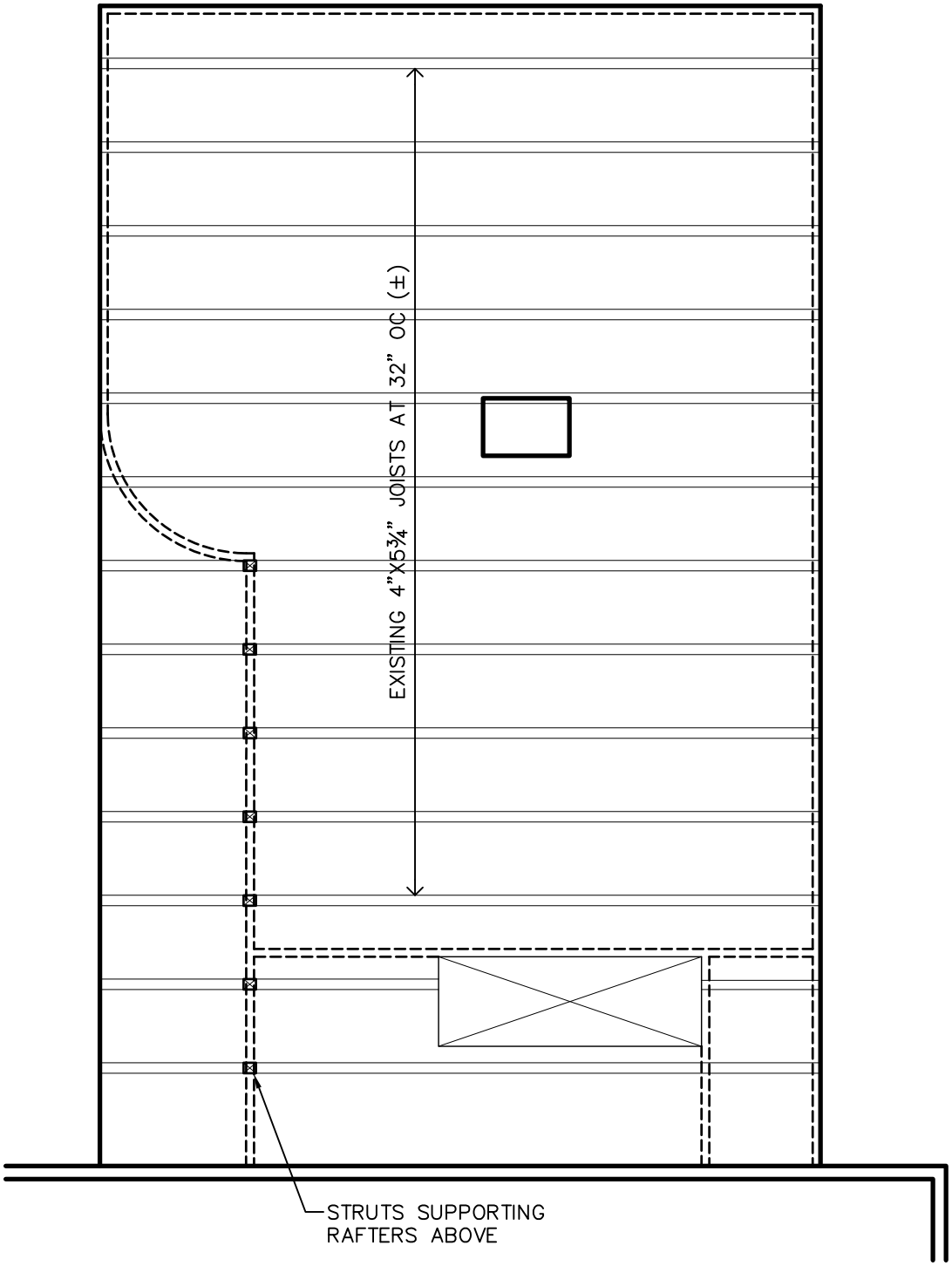
603-988-1738

179 Pleasant Street
Portsmouth, New Hampshire

Date: 1-21-2022	Affected Document: NA
Revision:	Sheet Number: SK3

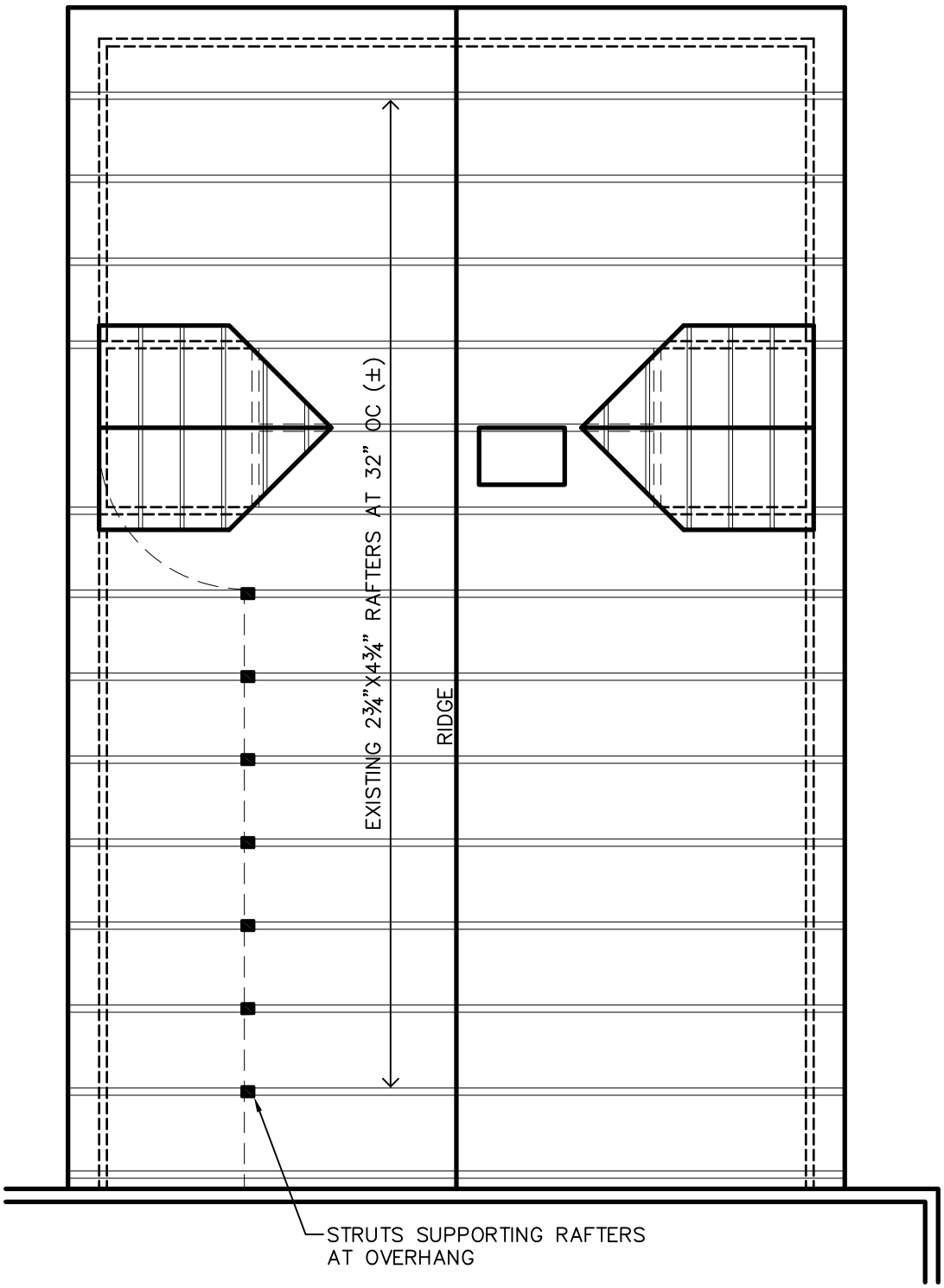


1/SK THIRD FLOOR FRAMING PLAN

GORHAM STRUCTURAL
11 Burnham Avenue, Durham NH 03824
603-988-1738

179 Pleasant Street
Portsmouth, New Hampshire

Date: 1-21-2022	Affected Document: NA
Revision:	Sheet Number: SK4



1/SK ROOF FRAMING PLAN

GORHAM STRUCTURAL
11 Burnham Avenue, Durham NH 03824
603-988-1738

179 Pleasant Street
Portsmouth, New Hampshire

Date: 1-21-2022	Affected Document: NA
Revision:	Sheet Number: SK5

Steven C. Mallory
Architectural conservator
191 South Road, Kensington NH 03833
1656amati@gmail.com 518/796.9324

18. January, 2022

Attn: Carla Goodknight: Project Architect, CJ Architects
Jake Weider: Architectural Designer
David Calkins: Owners Representative / General Contractor

Assessment of Historic Integrity

Captain Thomas Thompson Mansion
179 Pleasant Street, Portsmouth NH

Introduction

This memorandum outlines my observations when conducting a field inspection of the property described as the Captain Thomas Thompson Mansion, located at 179 Pleasant Street in Portsmouth, New Hampshire. The purpose of the assessment was to examine the historic structure but particularly the rear ell or "annex" for historical integrity and make recommendations for careful preservation as part of a greater renovation campaign that best serves the property, owners, and considers the requirements of the Historic District Commission.

As per onsite discussions with project manager David Calkins and architect Jake Wieder, the desire of the homeowner is to renovate the annex, which involves raising the building in order to tie in exterior roof lines and level interior floor planes. This will also involve replacing the inadequate first-floor decking and installing a code-compliant foundation.

As described in greater detail below, it is clear that the annex was added to the building in the mid 19th century as part of a greater Greco-Italianate style renovation to the 1780s historic mansion. It was placed over an irregular foundation and exhibits resultant settling.

Two approaches are possible to accomplish the desired outcome. The first would be to detach and raise the annex to align floors and exterior woodwork, also placing it on a new foundation. This would also involve moving windows and doors so they align with the fenestration of the main building. A second approach would be to remove the ell and replace it with a modern structure with framing allowances that comply with insulation values and structural loads, while replicating the original street-view facades and re-using original exterior architectural elements.

Addition of the annex likely involved removal of an 18th century small rear ell, perhaps the location of the original kitchen. The original basement to this lost element survives and is described below.

About Me

I am a senior architectural conservator with over 25 years of professional experience. My undergraduate degree is in Architecture from Skidmore College, and I did my graduate work (MSHP) from the University of Vermont. I have been mostly a consultant specializing in museum structures and private owners of historic houses from the Mid-Atlantic to Maine. I was also the restoration manager for George Washington's Mount Vernon Estate and Gardens for many years. I have done many projects for the Town of Wells, Maine, the Old York Historical Society in York, Maine, Strawbery Banke Museum in Portsmouth, and provided the restoration specifications for the exterior of the American Independence Museum's Folsom Tavern in Exeter in concert with architect John Merkle in the early 2000s as local examples of my work. I have done many conditions assessments, historic structures reports, architectural surveys and preservation specifications for the New Hampshire Preservation Alliance and LCHIP projects across New Hampshire.

To better describe my role in the preservation community, I am a forensics expert for historic structures. I analyze architectural design elements, building materials, nail types, hardware, tool marks, tree ring science, and paint history among other things to determine what a given building started out as, and how it evolved over time. I also evaluate existing conditions and develop preservation-friendly strategies that maximize preservation while also considering sustainability and practicality.

Summary of Findings

Addition of the annex likely involved removal of an 18th century small rear ell. Some evidence in the floor framing in this area suggests that the original cooking fireplace was more or less located in the position of the current (19th century) basement stairwell. The foundation and cellar of the earlier ell were incorporated within the 19th century annex, resulting a full basement at the south end and a crawlspace at the north; a shallow-footed stone foundation with a largely inaccessible crawlspace below. I recommend that regardless of the future approach for the annex above, that the footprint of the 18th century ell and the foundation be retained in any new foundation work.

The annex contains an historically important 19th century chimney that includes a rare cast iron built-in cookstove as well as a set kettle. This interior feature is somewhat beyond the purview of the Historic Commission except that above the roof line it is an important exterior character-defining feature. Retaining this element while raising the building as proposed is challenging but possible. Incorporating it within a replacement structure is equally challenging and possible.

The framing of the annex is representative of a major shift in American wood-framed building traditions away from the timber frame and toward modern balloon framing. This building exhibits characteristics of both. Retaining the existing structure and raising it will surely involve building out existing studs, joists and rafters to accommodate current codes for load, insulation and energy efficiency. This will result in the same slight loss of interior space as if the structure were replaced with a modern one.

The biggest design concern with either approach is with how to tie in the original compound Georgian cornice of the main house with the Greek Revival cornice of the annex. These can essentially die into one another with creative, clean woodworking joints. The most important aspect of this issue will be obtaining an even valley and drip edge at this intersection.

With the exception of the 1970s solarium and rear picture window (not visible from any public vantagepoint), the exterior of the annex retains a great deal of historic integrity. Sophisticated surgery would be involved in retaining and lowering existing windows if the existing structure were retained in its entirety, but this is possible.

I hope this memo proves helpful. Please do not hesitate to reach out with any further questions, clarifications or concerns.

Best regards,
Steven

409 Franklin Pierce Highway LLC
PO Box 399
Nottingham, NH 03290
603-679-1131

RE: 205 Market Street
Portsmouth, NH 03801

Masonry Contractor Bio and Qualifications Summary
Millstone Masonry
Barrington, NH 03825
603-942-8897

Millstone masonry is a family owned and operated business in Barrington NH. They have been operating for over 25 years in the greater seacoast area. They provide professional and detailed masonry services to the residential and commercial markets.

Millstone has experience dealing with historically sensitive properties and has become the Portsmouth Naval Shipyards preferred mason when dealing with restoration projects. They have been working with the shipyard since 2015 and have been involved in numerous projects. These projects range from repointing to partial replacement of wall sections. All of the historical work has been executed under the direction of Kerry Vautrot the historical consultant for the Naval Shipyard.

During these projects Millstone is required to provide mortar analysis reports and composition as well as brick selections for review. They also have been required to build mock wall sections to illustrate methodology, material selection, and detailed sections. All of the work has to be conducted in accordance with the Technical Preservation Services and preservation briefs.
https://www.nps.gov/tps/how-to-preserve/briefs/2-repoint-mortar-joints.htm

Millstone has also worked on projects under the supervision of Margaret Gaertner. Margaret is a historic building consultant through the NH Division of Historical Resources. Margaret was satisfied with Millstones procedures and installation practices on the projects they worked together.

Through the 25 plus years of experience and the work they have completed at the Naval Shipyard, Millstone Masonry is a qualified choice for the repair, repointing, and if needed restoration of the brick work at 205 Market Street.

deGruchy's LIME WORKS.us™

Characterization of Historic Mortars:

205 Market Street,
Portsmouth, NH 03801

Prepared by:
Jyotsna Naga Aikens
Laboratory Consultant

Prepared for:
Spencer Conroy
Millstone Masonry

April 16, 2021

Table of Contents

Characterization of Historic Mortars and Plasters

Section 1.0: Purpose Statement....4
1.1: Background....4
1.2: Executive Summary....5
Section 2.0a: Analytical Summary (Sample 1)....6
2.1a: Characterization of Extracted Aggregate (Sample 1)....7
Section 2.0b: Analytical Summary (Sample 2)....10
2.1b: Characterization of Extracted Aggregate (Sample 2)....11
Section 3.0: Product Recommendations....14
Section 4.0: Testing Methodology....16
Section 5.0: Definitions....17

Cover Image: Ward, Andrew M. "Multifamily Sold - New Hampshire: United States." COLLIERS INTERNATIONAL. Accessed April 15, 2021. https://www.colliers.com/en/properties/waterfront-mixed-use-building/usa-205-market-street-portsmouth-nh-03801/usa1082296.

Section 1.0: Purpose Statement

The purpose of a basic acid digestion mortar analysis is to determine the approximate proportions of three principal components of historic mortars—aggregate, binder, and fines. Certain additives may also be detected via this method, but their proportions may not be accurately determined. A basic mortar analysis is primarily used to help ascertain general details about composition of a mortar for the purpose of recreating a historic blend or as a prelude to further instrumental analysis. Thus, this test is most useful for identifying whether cement, lime, and sand are present and in what quantities. Acid digestion can be an important part in developing plans for repairing and maintaining historic structures. For further information on methodology, please see Section 4.0.

However, while this test protocol is useful for distinguishing general characteristics associated with different binders, it is important to note that the test is subjective, based on the interpretation of data and physical properties, rather than unequivocal. Interpretation relies not only on the data produced while testing, but also on observed physical characteristics such as color, texture, hardness, cohesiveness, and visual properties of aggregate. Additional clarification on specific properties or additives of a mortar, such as additional pigments, modifying additives, cement type, or mineralogy, would require further instrumental analysis (X-Ray Diffraction, SEM-XEDS, petrography, and other tests) which can be arranged at a client's request for fees to be determined on a case-by-case basis. It is important to note that testing cannot determine several other important factors in mortar which are difficult or impossible to accurately ascertain, including original water mix, mixing and pointing method, rate of drying, or original condition/origin of aggregate.

Lime*Works*.us personnel conduct these analyses with care to produce accurate results to the greatest degree possible. However, it is up to the client to confer with owners, conservators, masons, and/or installers to determine material appropriateness, installation methods, and performance testing of recommended products beyond data provided by the manufacturer. Lime*Works*.us staff will use information gathered during this test to recommend a compatible material from our products and any additional steps or services if necessary or requested. These recommendations can be found in Section 3.0.

Section 1.1: Background

Two samples were submitted from different parts of the building to Lime*Works*.us by Spencer Conroy of Millstone Masonry. Both the samples were bedding mortar sized between 1/4"-3/8". Sample one was extracted from the street side, above low window, near the salt pile. Sample two on the other hand was extracted from the parking lot corner, near the street. Both the samples were partially intact with some portions reduced to powder upon receipt.

The four-story, 8263 Sq Ft historic waterfront building was built in 1830.[1] Idyllically located in downtown Portsmouth, over-viewing the Piscataqua River, the property type is a mixed-use type with retail space on the first floor and six apartments on the others. The building was recently renovated in 2006. Proximity to a foundry and salt pile add a dimension of conservation concern unusual to most structures.

1 Ward, Andrew M. "Multifamily Sold - New Hampshire: United States." COLLIERS INTERNATIONAL. Accessed April 15, 2021. https://www.colliers.com/en/properties/waterfront-mixed-use-building/usa-205-market-street-portsmouth-nh-03801/usa1082296.

Section 1.2: Executive Summary

Because of the amount of samples submitted, the full details of this report are lengthy. As such, this executive summary section has been prepared in order to summarize the relevant conclusions and recommendations. Reading the full detailed report is highly recommended to understand these conclusions and recommendations to ensure accuracy and agreement with the goals of the project before proceeding.

In this section, "Test Results" summarizes the data from the mortar analysis, "Mix Recommendations" summarizes the kind of mix the client should look for in a replacement mortar, and "Lime*Works*.us Products" lists the products available through Lime*Works*.us that meet or are analog to the recommendations. Mixes and products are to be considered appropriate substitutes for the historic mortar. If the historic mortar needs to be precisely replicated, additional testing according to ASTM C1324 would be required.

It is the responsibility of the client to read this report in its entirety and, in consultation with stakeholders or other authorities, determine the suitability of recommended products.

	Test Result	Mix Recommendation	Lime*Works*.us Products
Sample 1	1 part lime to 2.5 parts fine aggregate by weight.	1 part St. Astier NHL 3.5 to 2.5 parts fine sand in accordance with ASTM C1713. Color with aggregate or UV/alkali-stable pigments.	Ecologic Mortar DGM SCG (F) Non-Pigmented
Sample 2	1 part lime to 2.5 parts fine aggregate by weight.	1 part St. Astier NHL 3.5 to 2.5 parts fine sand in accordance with ASTM C1713. Color with aggregate or UV/alkali-stable pigments.	Ecologic Mortar SCG (F) in 90% DGM 050/ 10% DGM 250 w/XF Slag Fleck

Section 2.0b: Analytical Summary (Sample 1)

The reactive and physical characteristics of this mortar sample suggest it contains a binder based on a mixture of lime and sand at a ratio of 1 part binder to 2.5 parts aggregate by weight. This conclusion was based on the following observations:

Photograph of the bulk sample before digestion (fluorescent light, color corrected).

Sample Composition:

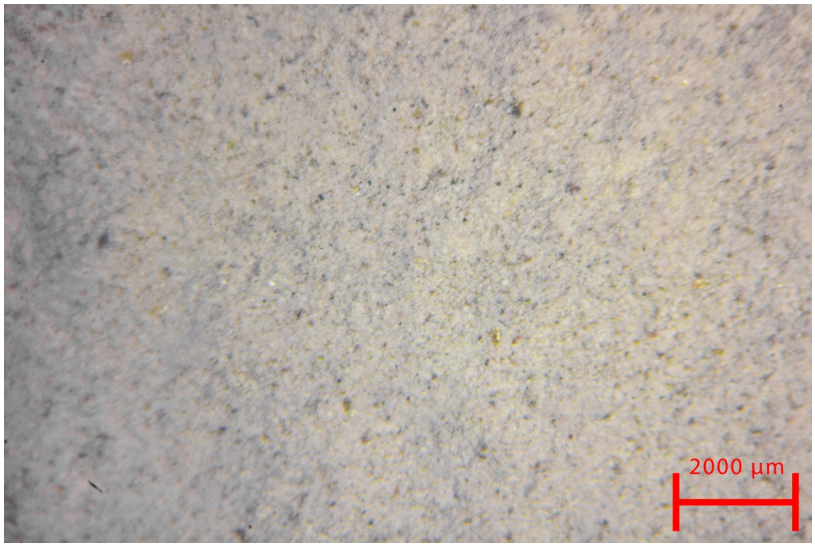
$CaCO_3$	~17.057%
$CaMg(CO_3)_2$	~4.310%
Solubles	~6.175%
Aggregate	~71.017%
Fines	~1.441%

Sample Observations:

- ***Layering:*** No layering was observed.
- ***Color:*** The clean break of the bulk sample corresponded to 7.5YR 8/1 *white*. This is consistent with a lime mortar.
- ***Hardness:*** The sample was cohesive and very easy to snap with a Mohs rating of 2.5, requiring low force to pulverize with a mortar and pestle. This is consistent with a lime mortar.
- ***Reactivity:*** The sample reacted vigorously with ample effervescence and a very little secondary reaction when exposed to a 14% dilution of hydrochloric acid. Mortars with high cement content tend to react less vigorously than mortars high in lime. Limes high in dolomite ($CaMg(CO_3)_2$) will have a secondary reaction after the primary calcium carbonate reaction ($CaCO_3$). Calcium carbonate, such as that found in lime mortars and calcareous aggregates, evolves a large amount of CO_2 when exposed to acid, while pure cement-based mortars release very little during acid digestion. The sample's reaction suggests a lime-rich mortar.
- ***Solubles*:** The low amount of solubles and high carbonate in this mortar suggests a low dolomitic lime mixture with the possibility of a very small amount of clay or other acid soluble material present. Calcium carbonate, such as that found in lime mortars and calcareous aggregates, evolves a large amount of CO_2 when exposed to acid, while cement-based mortars release very little during acid digestion. A mortar with very little carbonate and high solubles suggests the presence of a cement, while a mortar high in carbonates with few solubles is likely lime-based.
- ***Aggregate:*** Aggregates extracted from the mortar were various shades of pinkish gray with an overall average color of 7.5YR 6/2 *gray*, while extracted fines were 7.5YR 7/1 *light gray*. The surviving aggregate fell within the modern mortar aggregate grading standards found in ASTM C144. Overall, this aggregate can be characterized as well-graded and sharp. For more information on extracted aggregates please see Section 2.1.
- ***Fines:*** This mortar aggregate was very clean, with under 2% total weight in fines.

Section 2.1b: Characterization of Extracted Aggregate (Sample 1)

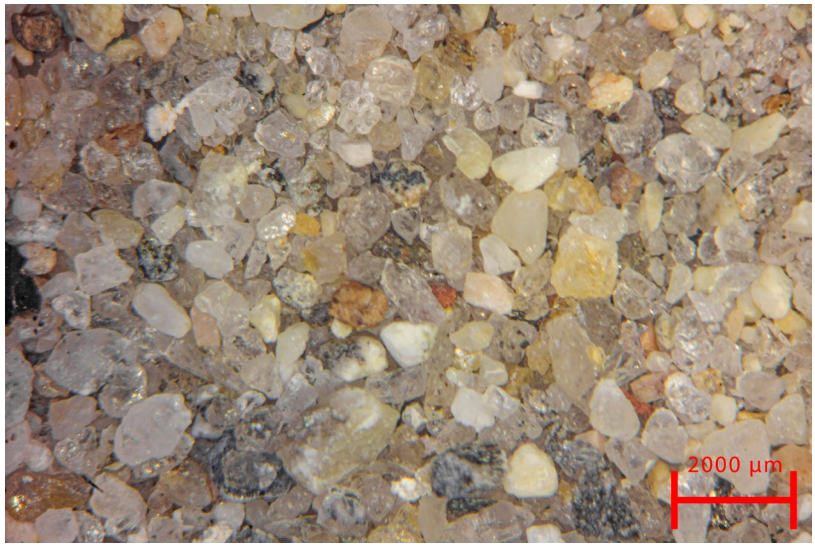
Because aggregate is an important portion of mortar, helping not only to determine material performance, but also in simulating historic color and texture, this mortar analysis includes a careful examination of aggregates extracted following the acid digestion of the sample. Analysis included a visual analysis and evaluation of particle size. This data can be used to both simulate a historic mortar and/or assess the potential properties imparted by an aggregate blend. It is important to note that certain portions potentially present in aggregate (such as crushed limestone, marble, and certain silicas) are fully or partially soluble in acid. These are included within a broad category of "solubles." Solubles would require further instrumental analysis to accurately characterize.



Photomicrograph of the weathered face of the bulk sample before digestion (incident daylight-balanced light, 10x magnification).

Individual grains of sand were generally shades of gray to pinkish gray with some other colors sporadically mixed in. As a result, the average color of sieved particles ranged almost entirely between 7.5YR 5/1 *gray* to 10YR 7/2 *pinkish gray* hue range, with some variation in value and chroma.

The aggregate particles varied widely in shape and roundness from very angular to subrounded in roundness and equant to very elongate in sphericity. The majority of material was captured by the #30 and #50 sieves. The fineness modulus of this aggregate was 1.962, indicating moderately coarse sand. The sand met ASTM C144's specifications for a masonry sand. For detailed definitions of these terms, please see section 5.0.

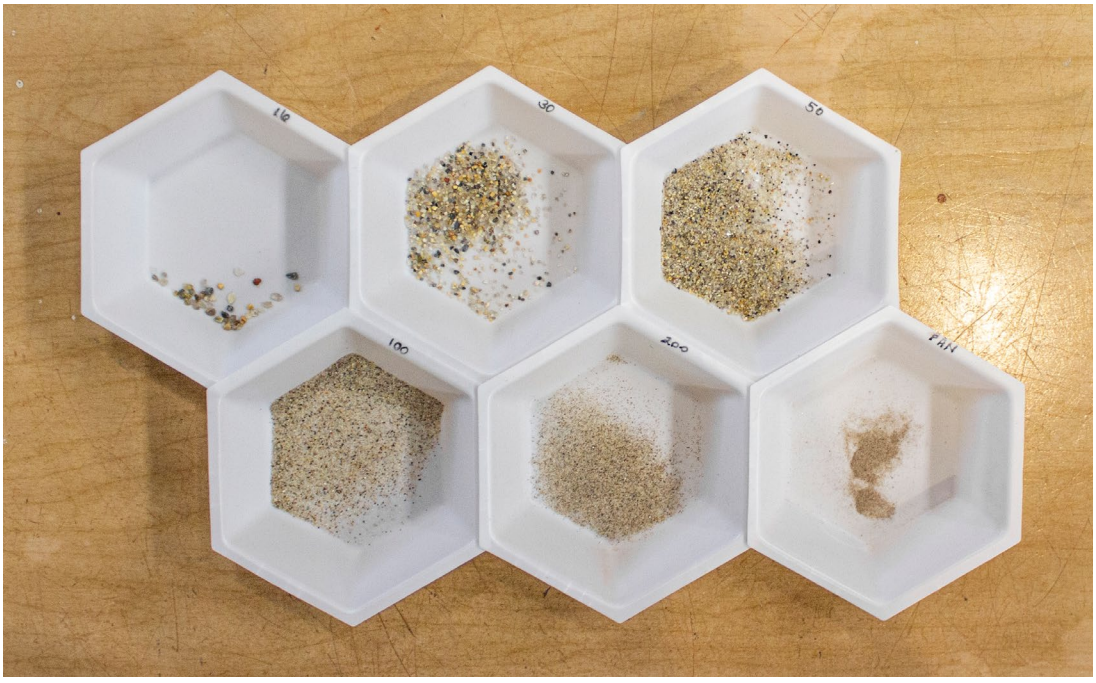


Photomicrograph of the extracted aggregate before sieving, note (incident daylight-balanced light, 10x magnification).

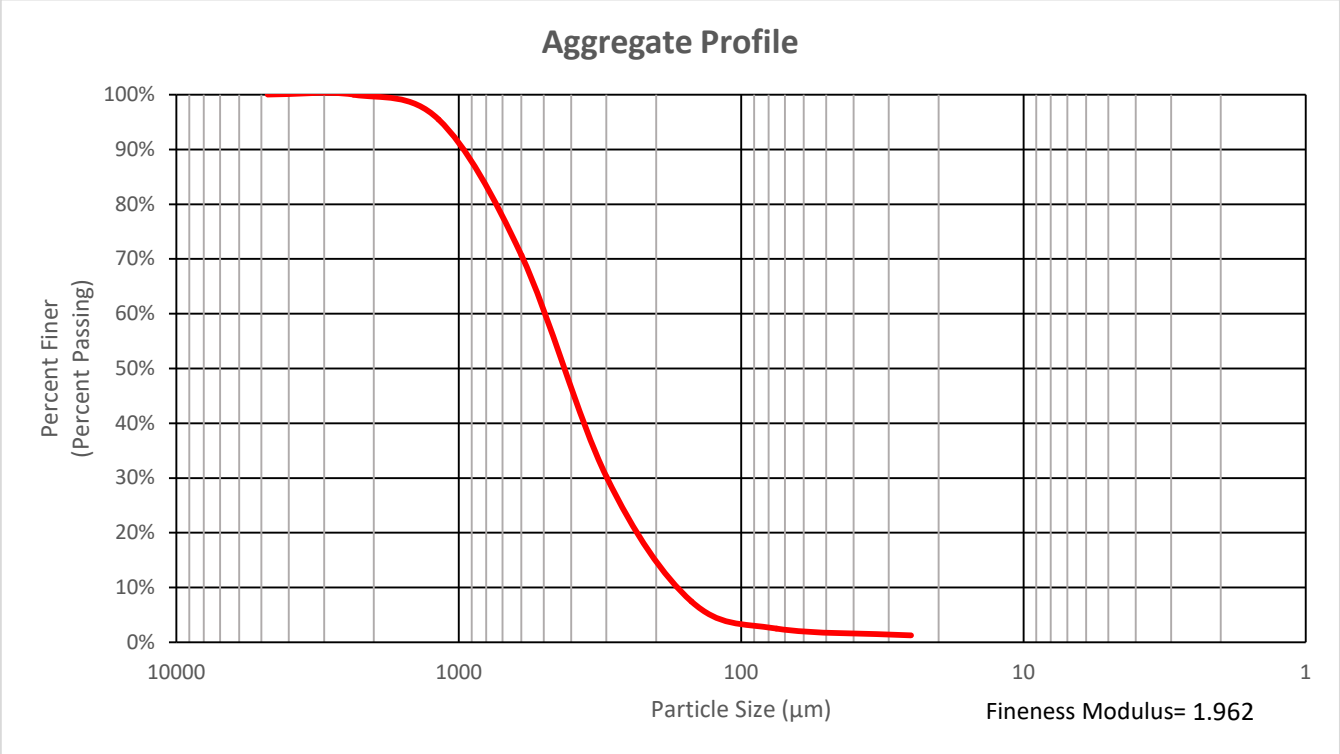
Extracted aggregates were sieved according to ASTM C136. Material was passed through a US Standard Sieve Stack (as governed in ASTM E11) and material retained on each mesh was recorded by weight and expressed as a percentage of the whole to determine approximate grading of the aggregate. Results are as follows:

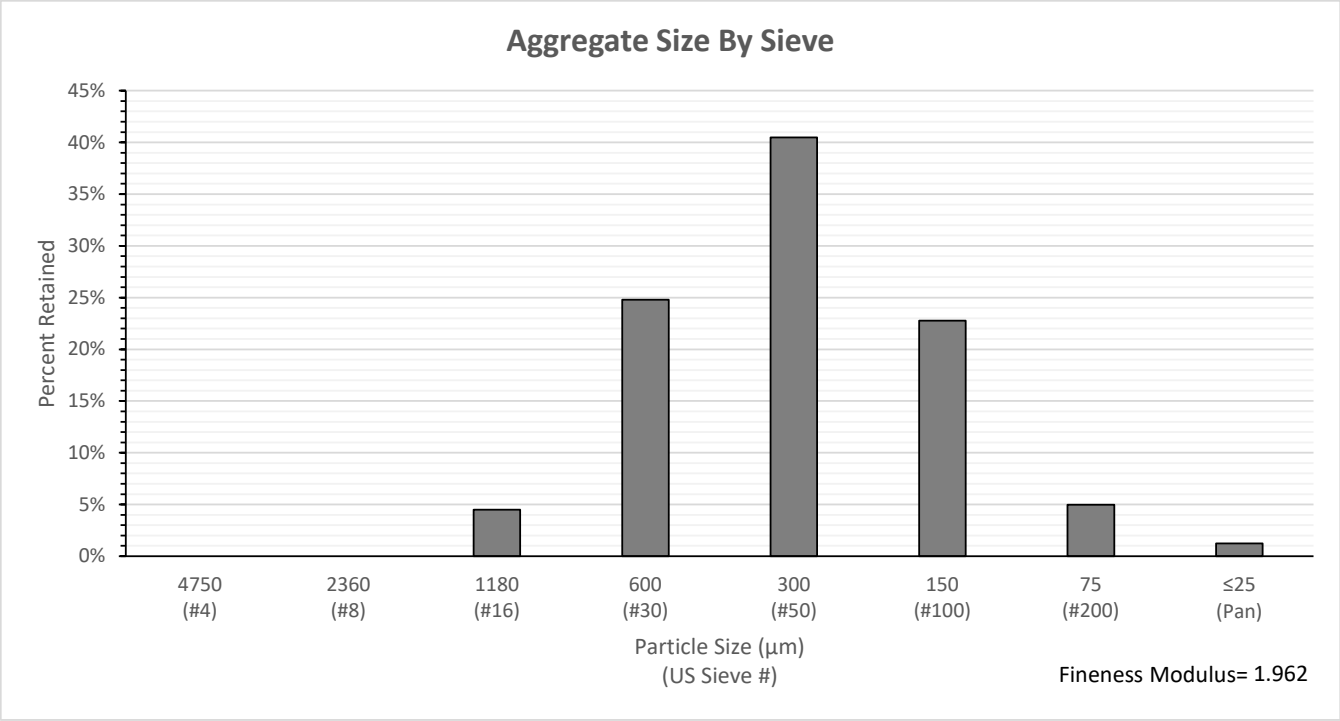
Aggregate Grading:

Sieve Number	#4	#8	#16	#30	#50	#100	#200	Pan
Screen Size	4750µm	2360µm	1180µm	600µm	300µm	150µm	75µm	≥25µm
Aggregate Retained	0.000%	0.000%	4.510%	24.803%	40.474%	22.773%	4.961%	1.240%



Washed and sieved sands sorted according to sieve size (color corrected fluorescent light)


Aggregate Profile
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Finer
(Percent Passing)
10000
1000
100
10
1
Particle Size (µm)
Fineness Modulus= 1.962


Aggregate Size By Sieve
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Percent Retained
4750
(#4)
2360
(#8)
1180
(#16)
600
(#30)
300
(#50)
150
(#100)
75
(#200)
≤25
(Pan)
Particle Size (µm)
(US Sieve #)
Fineness Modulus= 1.962

Section 2.0c: Analytical Summary (Sample 2)

The reactive and physical characteristics of this mortar sample suggest it contains a binder based on a mixture of lime and sand at a ratio of 1 part binder to 2.5 parts aggregate by weight. This conclusion was based on the following observations:

Photograph of the bulk sample before digestion (fluorescent light, color corrected).

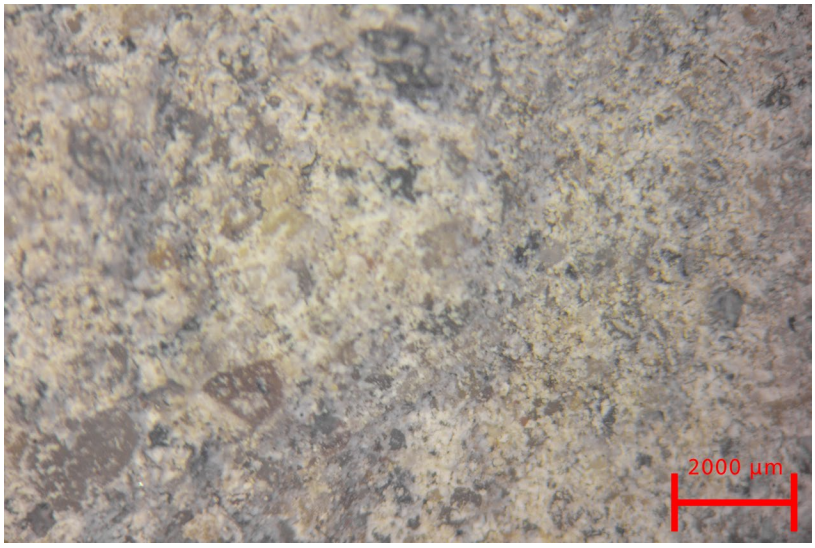
Sample Composition:

$CaCO_3$	~13.982%
$CaMg(CO_3)_2$	~2.897%
Solubles	~11.314%
Aggregate	~70.652%
Fines	~1.155%

Sample Observations:

- ***Layering:*** No layering was observed.
- ***Color:*** The clean break of the bulk sample corresponded to 10YR 8/1 *white*. This is consistent with a lime mortar.
- ***Hardness:*** The sample was cohesive and very easy to snap with a Mohs rating of 3, requiring low force to pulverize with a mortar and pestle. This is consistent with a lime mortar.
- ***Reactivity:*** The sample reacted vigorously with ample effervescence and a very little secondary reaction when exposed to a 14% dilution of hydrochloric acid. Mortars with high cement content tend to react less vigorously than mortars high in lime. Limes high in dolomite ($CaMg(CO_3)_2$) will have a secondary reaction after the primary calcium carbonate reaction ($CaCO_3$). Calcium carbonate, such as that found in lime mortars and calcareous aggregates, evolves a large amount of CO_2 when exposed to acid, while pure cement-based mortars release very little during acid digestion. The sample's reaction suggests a lime rich mortar.
- ***Solubles*:** The moderate amount of solubles and high carbonate in this mortar suggests a mixture with clay or other soluble material added. However, the other properties of this mortar seem to suggest that the soluble material is not cement or pozzolanic additives. Calcium carbonate, such as that found in lime mortars and calcareous aggregates, evolves a large amount of CO_2 when exposed to acid, while cement-based mortars release very little during acid digestion. A mortar with very little carbonate and high solubles suggests the presence of a cement, while a mortar high in carbonates with few solubles is likely lime-based.
- ***Aggregate:*** Aggregates extracted from the mortar were various shades of bluish gray-light brownish gray with an overall average color of 10YR 7/1 *light gray*, while extracted fines were also 10YR 7/1 *light gray*. The surviving aggregate fell within the modern mortar aggregate grading standards found in ASTM C144. Overall, this aggregate can be characterized as well-graded and sharp. For more information on extracted aggregates please see Section 2.1.
- ***Fines:*** This mortar aggregate was very clean, with under 2% total weight in fines.

Section 2.1c: Characterization of Extracted Aggregate (Sample 2)



Photomicrograph of the weathered face of the bulk sample before digestion (incident daylight-balanced light, 10x magnification).

Because aggregate is an important portion of mortar, helping not only to determine material performance, but also in simulating historic color and texture, this mortar analysis includes a careful examination of aggregates extracted following the acid digestion of the sample. Analysis included a visual analysis and evaluation of particle size. This data can be used to both simulate a historic mortar and/or assess the potential properties imparted by an aggregate blend. It is important to note that certain portions potentially present in aggregate (such as crushed limestone, marble, and certain silicas) are fully or partially soluble in acid. These are included within a broad category of "solubles." Solubles would require further instrumental analysis to accurately characterize.

Photomicrograph of the extracted aggregate before sieving (incident day-light-balanced light, 10x magnification).

Individual grains of sand were generally shades of light gray to light brownish gray with some other colors sporadically mixed in. As a result, the average color of sieved particles ranged almost entirely in the 10YR hue range, with individual sieve colors ranging in value and chroma from 5/1 *gray* to 7/2 *light gray*.

The aggregate particles varied widely in shape and roundness from very angular to rounded in roundness and very elongate to equant in sphericity. The majority of material was captured by the #30 & #50 sieve. The fineness modulus of this aggregate was 2.045, indicating moderately coarse sand. The sand met ASTM C144's specifications for a masonry sand. For detailed definitions of these terms, please see section 5.0.

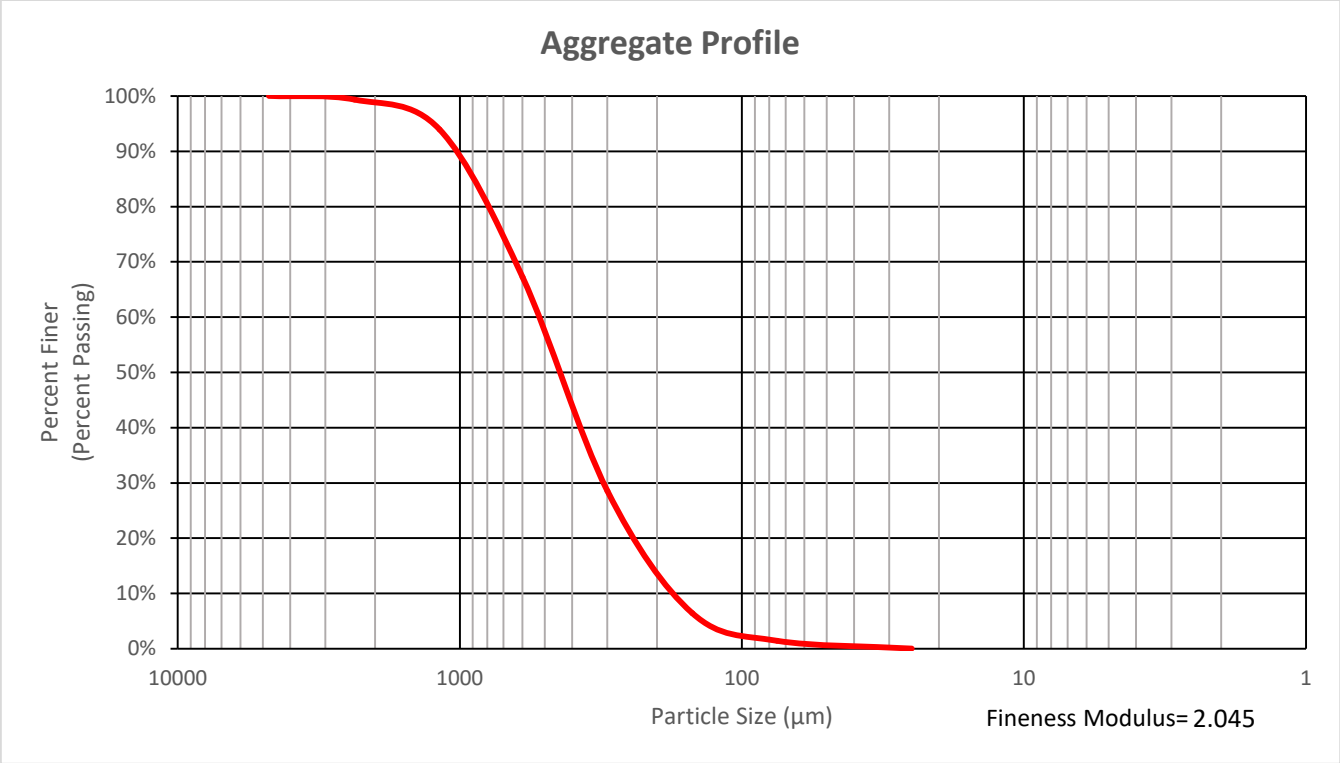
This material cannot be positively identified in this test but was weakly magnetic suggesting it may be an iron oxide pigment, iron fines, or material introduced into the mortar from its industrial location. Whether or not these are natural parts of the aggregate, introduced by the binder, is not known. In order to learn more, this mortar is a strong candidate for further instrumental analysis according to ASTM C1324.

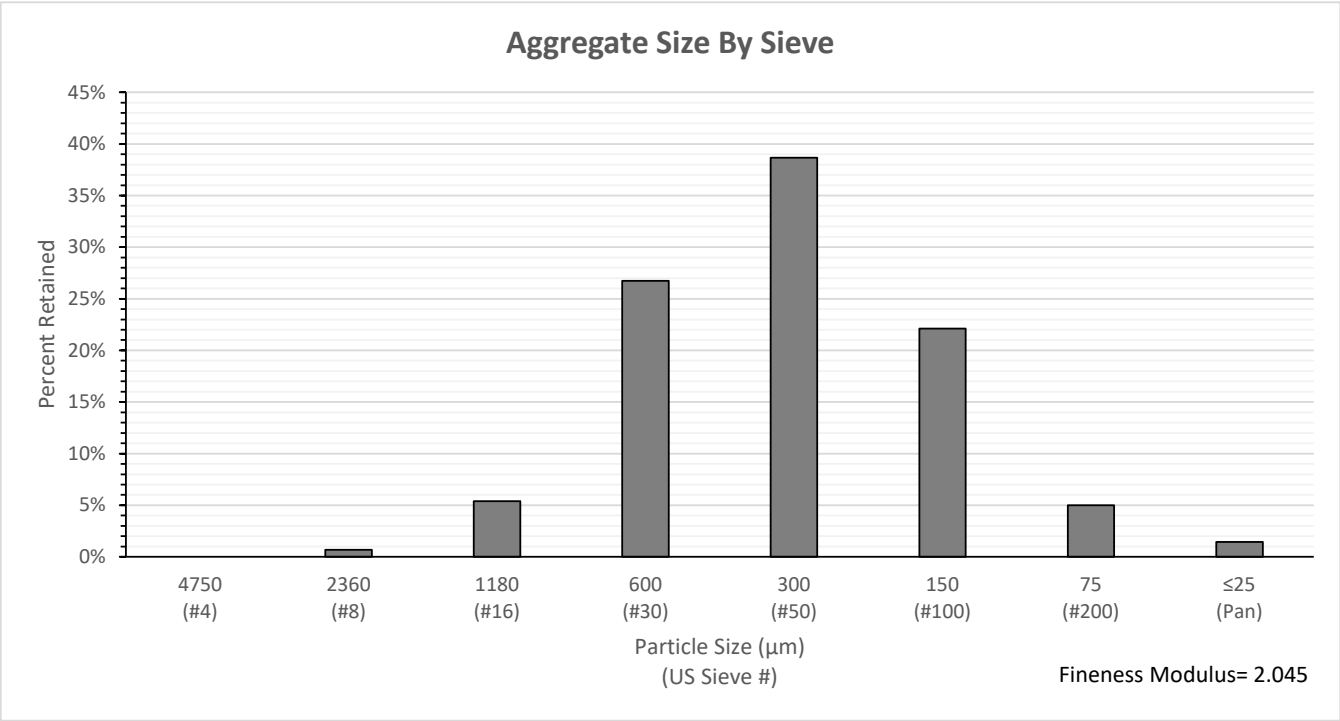
Extracted aggregates were sieved according to ASTM C136. Material was passed through a US Standard Sieve Stack (as governed in ASTM E11) and material retained on each mesh was recorded by weight and expressed as a percentage of the whole to determine approximate grading of the aggregate. Results are as follows:

Aggregate Grading:

Sieve Number	#4	#8	#16	#30	#50	#100	#200	Pan
Screen Size	4750µm	2360µm	1180µm	600µm	300µm	150µm	75µm	≥25µm
Aggregate Retained	0.000%	0.673%	5.385%	26.731%	38.654%	22.115%	5.000%	1.442%

Washed and sieved sands sorted according to sieve size (color corrected fluorescent light)





Phone: 215-536-6706
Fax: 215-536-2281
3145 State Road, Telford, PA 18969
Website: www.Lime*Works*.us
Email: admin@limeworks.us

Section 3.0: Product Recommendations

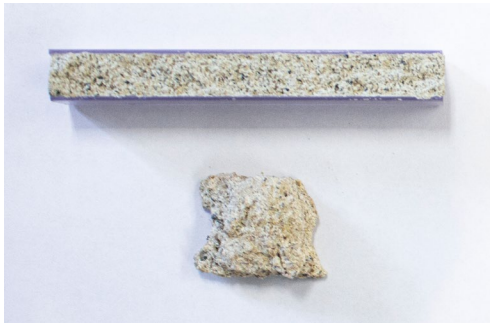
The National Register, the Secretary of the Interior's *Standards for the Treatment of Historic Properties* published by the National Park Service recommends replacing a historic mortar with a mortar similar to or sympathetic to the original. In cases where the material properties of the masonry have degraded over time, these standards recommend considering a lime mortar instead of historic cementitious mortars.[2]

Given that the analysis suggests that both the submitted mortar samples was a relatively soft lime mortars, and in consideration to the small size of the mortar joints and geographic location, a replacement mortar based on Natural Hydraulic Lime 3.5 (NHL 3.5) would normally be recommended. However, the proximity to salt water and a salt pile could pose weathering stresses that may dictate a stronger NHL such as an NHL 5. This denser NHL is generally compatible with historic masonry, but like with all structures, care should be taken to assess the state of the masonry to ensure denser mortars are appropriate. The advantage to a higher strength NHL like 5 is that it is more resistant to weathering, particularly from salts and sea air. The client should take care to assess the condition of the masonry before choosing an NHL strength, as NHL 5 should only be used on dense stone or brick. Regardless of the NHL strength, only St. Astier NHL is recommended here due to the specific mineralogy of the quarry which results in an NHL that is highly resistant to salts and sulfate, and gains strength more consistently in damp environments than other NHL brands.

Sample 1 compared to the recommended product substitution (color-corrected fluorescent light).

NHL is a traditional building material which offers certain advantages over non-hydraulic lime materials, lime-Portland hybrids, and cement-based materials. Whereas materials based on slaked lime putty or dolomitic lime cure with a process of carbonation over extended periods of time, NHL achieves a cure time more quickly through hydration. Additionally, materials based on St. Astier® NHL are typically more durable than those based on non-hydraulic limes, yet more flexible, vapor-permeable, and sulfate resistant than lime-cement hybrids or cementitious materials.

Given that all the samples were approximately 1/4” to 3/8” profile of the joints on the building, a fine sand is recommended mixed in a ratio of 1 part lime to 2.5 parts sand in accordance with ASTM C1713, based on the joint thickness with an appropriate mix of grain sizes distributed between the #30 and #100 sieves. The sand should be dry, clean, sharp, and contain a mixture of particle sizes and shapes to best optimizing the mortar properties. Color matching can be achieved either through the use of colored aggregates or by using a alkali-stable, UV-stable dry powdered pigment.



Sample 2 compared to the recommended product substitution (color-corrected fluorescent light).

1) Sample 1: Color-wise, the color of the mortar is a very close match to Lime*Works* **Ecologic Mortar DGM SCG (F) Non-Pigmented.**

2) Sample 2: From the Lime*Works* product line, **Ecologic Mortar SCG (F) in 90% DGM 050/ 10% DGM 250 W/XF Slag Fleck** is close in color and graduation to Sample 2.

2 United States, Department of the Interior, National Park Service Technical Preservation Services, The Secretary of the Interior’s Standard for the Treatment of Historic Properties, ed. Anne E. Grimmer, 2017, (accessed November 4, 2020, https://www.nps.gov/tps/standards/treatment-guidelines-2017.pdf), 84.

It is the client's responsibility to perform appropriate mock ups or other tests to determine if these mortars are acceptable. If selected, these products can be ordered in any quantity by speaking to a Lime*Works*.us representative.

Please Note: While analysis suggests the recommended mortar is an appropriate substitution for the historic mortar, if the mortar needs to be *recreated* and not simply *substituted*, additional analysis will be required to better understand the specific aggregates, binders, or other material in the sample. Product recommendations are provided as a good faith courtesy and are not warranties or guarantees. It is the responsibility of the client and any relevant stakeholders to determine final product suitability and selection. Please speak to a Lime*Works*.us representative to discuss timetables, pricing, and additional testing options if any additional services or products are necessary.

Section 4.0: Testing Methodology

Testing is completed by an architectural conservator specializing in masonry and with sufficient education and experience to meet the American Institute for Conservation's qualifications for a conservator and bound by the AIC's Code of Ethics; or an experienced lab technician under the observation and review of an architectural conservator. Reports are written by the same and reviewed according to Lime*Works*.us strict quality control standards. All testing is performed in a laboratory conditioned to ASTM C511 specifications for a mortar mixing room.

The approximate composition of the material was determined by referencing the Jedrzejewska analytical method with a calcimeter and techniques conforming to the specifications outlined in ASTM D4373.[1] This technique essentially breaks down a sample into constituent parts and provides data on the nature of the binder by gauging the extent of its reaction with hydrochloric acid (HCl). As HCl dissolves bicarbonates of calcium carbonate ($CaCO_3$) and magnesium calcium dicarbonate ($CaMg(CO_3)_2$) compounds found in lime and (to a lesser extent) cement binders, carbon dioxide (CO_2) is produced. While not absolute and open to a degree of interpretation, by using standard gas/temperature/pressure laws, it is possible to calculate approximate amounts of carbon dioxide released during the acid digestion of the sample providing a reasonable estimation of the amount of carbonates present in the binder of the sample. Data obtained during experimentation was compared with published experimental standards based on known mixes to arrive at conclusions about the composition of all samples.[2] This method has its limits, as it can only give an approximation which can be skewed in the presence of certain additives like gypsum, and cannot differentiate between calcium-carbonate and magnesium-carbonate. Aggregates made of acid soluble material such as shells, marble, or limestone may also not be adequately characterized. A certain amount of error can be introduced by the process of crushing the sample for acid digestion, especially in mortars that require a great deal of force to pulverize.

Insoluble portions of the aggregate were retained and washed, while fine particulates of the material were captured in 20-25µm filter paper and retained. The aggregate was dried and weighed, and evaluated according to particulate size with a Standard U.S. Sieve Stack corresponding to ASTM E11 as outlined in ASTM C136. Sorted aggregate was then examined microscopically for particle sphericity, roundness, color, sorting, and other physical properties. Fine particulates, once filtered, were dried, weighed, and examined visually and microscopically. Color classification is performed using the Munsell Color System in accordance with ASTM D1535.

All microscopic examination was conducted using a Nikon SMZ-2T trinocular reflected light microscope, illuminated by an AmScope 312W-2GOP LED daylight-balanced illuminator. Photographs of samples were captured using a Canon EOS T5 DSLR camera with a special lens designed to make use of the microscope's trinocular bay. All photographs were then color corrected using Adobe Photoshop.

The degree of testing discussed herein is sufficient to establish a basic understanding about the composition of the materials supplied to our laboratory. That said, gravimetric analysis and tests which utilize acid digestion constitute an inexact science, relying substantially on the experience and interpretation of the analyst as well as comparison with materials with known composition. As such, this report should not be interpreted as providing absolute objective composition data on the material. Petrographic analysis including examination of thin sections in transmitted polarizing light and/or elemental analysis would be required to identify mineral phases which are specific to different types of cementing material and to unequivocally quantify the amount of lime and/or cement present. If analysis in accordance with testing procedures described in ASTM C1324 is desired, micro-chemical characterizations may be expanded upon with elemental analysis using techniques such as X-Ray Diffraction (XRD), petrography, and/or physical characterizations of thin sections using transmitted and polarized light microscopy.

1 Hanna Jedrzejewska, "Old Mortars in Poland: A New Method of Investigation," Studies in Conservation 5, no. 4 (November 1960): , doi:10.2307/1505237.

2 James Christopher Frey, *Exterior Stuccoes as an Interpretive and Conservation Asset: The Aiken-Rhett House*, Charleston, SC, Master's thesis, University of Pennsylvania, 1997 (Philadelphia, PA: University of Pennsylvania, 1997); John Stewart and James Moore, "Chemical Techniques of Historic Mortar Analysis," Bulletin of the Association for Preservation Technology, Vol. 14, No. 1 (Washington: APT, 1982), 11-16.

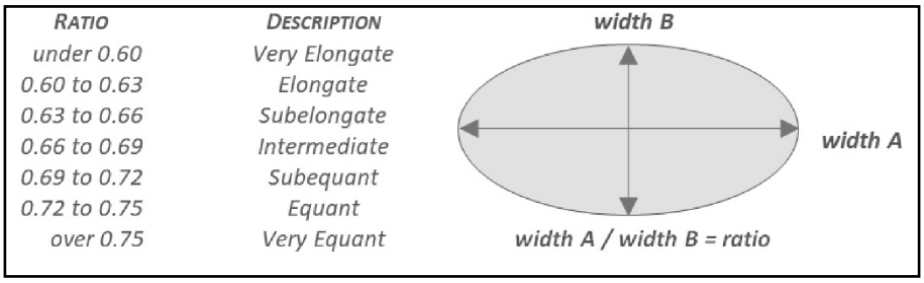
Section 5.0: Definitions[1]

- **Grading:** Grading is a measurement of how well distributed particulate sizes are within the aggregate of a sample. A sample with a broad, even distribution of grains from small to large is considered well-graded. Grading of materials helps predict certain properties of a mortar, such as shrinkage, porosity, permeability, and curing behavior. Appropriate grading for modern mortars is governed by ASTM C144, but historic mortars will vary widely from modern specifications. Typically, modern mortar sands will have a fineness modulus between 2.1 and 3.2, with smaller numbers indicating a finer sand and larger a coarser sand.

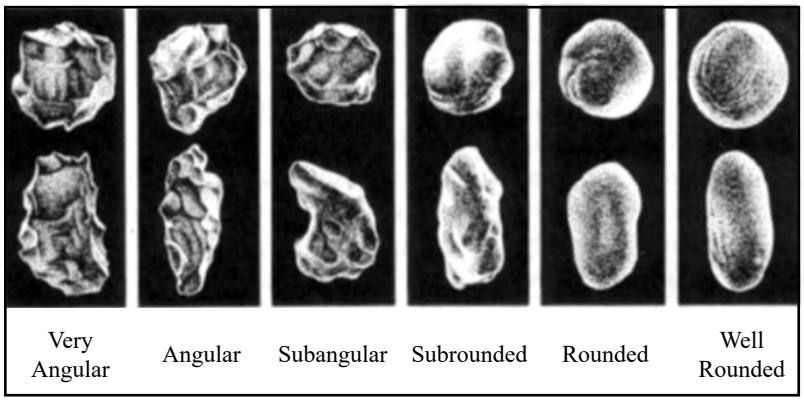
- **Hardness:** Hardness is a subjective measurement of how difficult the mortar is to snap or pulverize. Hardness can also be characterized using the Mohs Hardness Scale, which is a qualitative scale ranking an objects hardness by its resistance to being scratched by harder objects. For example, a sample with a Mohs rating of 5 will be scratched by (but cannot scratch) a 6, while being able to scratch (but not be scratched) by a 4. The Mohs Scale is based on a comparison to the hardness of known minerals.

Hardness	1	2	3	4	5	6	7	8	9	10
Mineral	Talc	Gypsum	Calcite	Fluorite	Apatite	Feldspar	Quartz	Topaz	Corun-dum	Dia-mond

- **Sphericity:** Sphericity compares the size of individual particles to how close they approach a perfect sphere. Samples very close to a sphere are said to be "very equant," while samples that are more distant from spherical are said to be "very elongate."

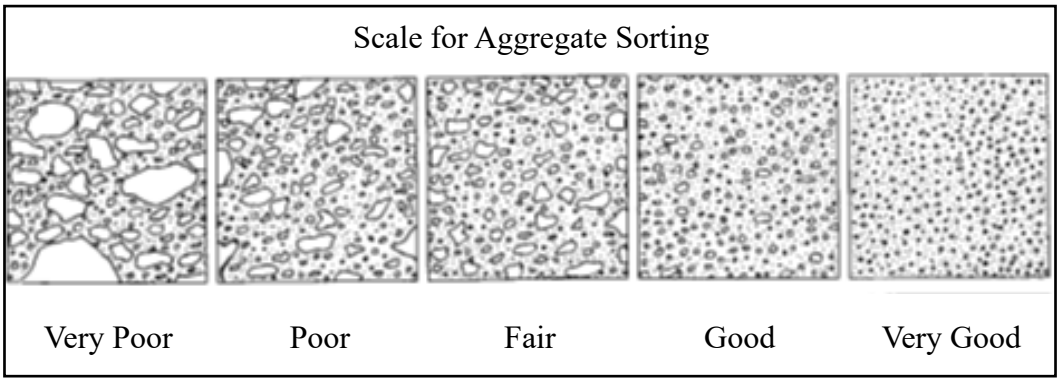


- **Roundness:** Roundness is an observation of the sharpness of the edges and corners of a particle. A particle that is significantly worn by abrasion to the point that it appears smooth is considered *well-rounded*, while a particle that appears cleaved with very sharp edges and little abrasion is considered *very angular*.

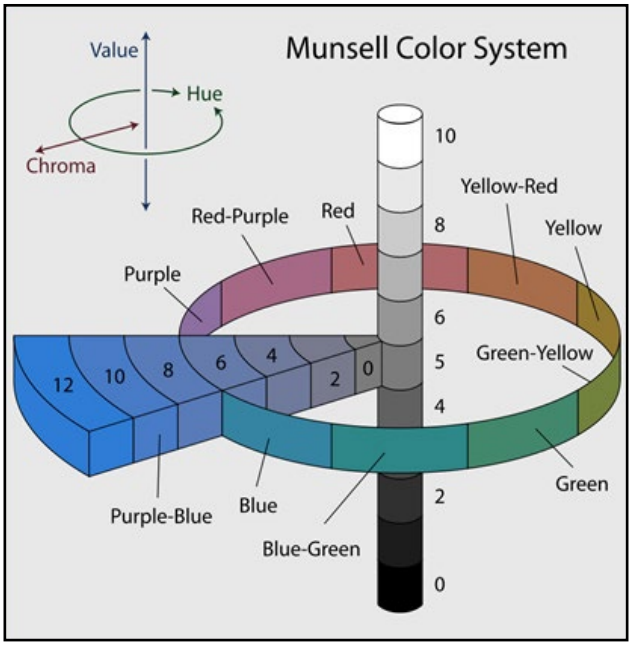


1 Definitions and figures adapted from "Characterization of Granular Samples by Sieve Analysis," Graduate Department of Historic Preservation, HSPV 555, Spring 2016 (Philadelphia: University of Pennsylvania, 2016).

- **Sorting:** Sorting is a description of the degree of distribution of particles of varying size and shape within an individual sample. Samples that are *well-sorted* have nearly homogeneous size and shape distribution, while those that are *poorly sorted* have heterogeneous size and shape distribution.



- **Color:** Because color is subjective, the Munsell Color System attempts to classify the visual experience of color into perceived attributes of hue, lightness, and chroma. These values only apply to opaque samples that are viewed by individuals with healthy color vision in daylight conditions. This method provides a simple, more cost effective alternative to analytical procedures such as spectrophotometry. Munsell notations are given a number-letter-number combination in the form number-letter-slash-number representing Munsell hue (H), Munsell value (V), and Munsell chroma (C). A Munsell color guide also assigns each value an official name. Color classification using the Munsell Color System is performed in accordance to the procedures outlined in ASTM D1535.



PROSOCO®

You. Us. The project.

Saltguard® WB

INDOOR ADVANTAGE GOLD
BUILDING MATERIALS

PROSOCO Saltguard® WB is a ready-to-use water-based, VOC compliant silane/siloxane water repellent and "chloride screen" for the protection of concrete and masonry. Low odor and alkaline stable, Saltguard® WB is ideal for field or in-plant application to concrete and most masonry. Saltguard® WB protects horizontal and vertical surfaces from moisture intrusion and chemical attack of chloride salts.

In coastal areas, Saltguard® WB protects against salt air by screening chlorides from penetrating through concrete to the reinforcing steel. Saltguard® WB reduces rebar corrosion and surface spalling caused by water-carried salts. Use Saltguard® WB on horizontal surfaces such as driveways, sidewalks, and tile, brick and sandstone pavers. Provides excellent protection for retaining walls, bridge pilings and other vertical areas exposed to de-icing salts.

Saltguard® WB is an effective alternative to conventional solvent-based silanes and siloxanes. Saltguard® WB penetrates and chemically bonds deep within the concrete or masonry substrate to provide long-lasting protection against moisture intrusion and water-related staining or deterioration. Properly applied, Saltguard® WB produces no surface film. Treated surfaces keep their natural breathing characteristics and natural appearance.

REGULATORY COMPLIANCE

VOC Compliance

PROSOCO Saltguard® WB is compliant with the US Environmental Protection Agency's AIM VOC regulations. Visit www.prosoco.com/voccompliance to confirm compliance with individual district or state regulations.

ADVANTAGES

- **Penetrates to produce long-lasting protection on vertical or horizontal surfaces.**
- **Water-based formula minimizes explosion and fire hazards associated with alcohol- or solvent-based water repellents.**
- **Easy soap-and-water cleanup from window glass, window frames and equipment.**
- **Low odor reduces risk of application to occupied buildings.**
- **Alkaline stable – suitable for new "green" concrete, 14–28 days old. See Best Practices, page 3.**
- **Treated surfaces "breathe" – doesn't trap moisture.**
- **Effective protection against de-icing salts and salt air.**
- **Complies with all known national, state and district AIM VOC regulations.**

Limitations

- Not for use on natural stone, except sandstone.
- Do not apply at temperatures above 95°F (35°C). Higher temperatures evaporate the water carrier, which may result in an uneven appearance.
- Always test for proper penetration when applying to tightly troweled concrete, such as garage floors.
- Not suitable for protecting surfaces subject to constant water spray (car washes).
- Not suitable for application to coated surfaces or surfaces previously treated with water repellents or liquid hardeners.
- Will not prevent water penetration through structural cracks, defects or open joints.
- Saltguard® WB is not suitable for application to synthetic resin paints, gypsum, or other non masonry surfaces. The product may not be suitable for surfaces to receive paints or coatings. Always test for compatibility.
- Not recommended for below-grade application.

SAFETY INFORMATION

Always read full label and SDS for precautionary instructions before use. Use appropriate safety equipment and job-site controls during application and handling.

24-Hour Emergency Information:
INFOTRAC at 800-535-5053

TYPICAL TECHNICAL DATA

FORM	white liquid, odorless
SPECIFIC GRAVITY	0.997
pH	7–8
WT/GAL	8.24 lbs
ACTIVE CONTENT	5%
TOTAL SOLIDS	4.2%
VOC CONTENT	<25 g/L low solids coating
FLASH POINT	>212° F (>100° C)
FREEZE POINT	32° F (0° C)
SHELF LIFE	1 year in tightly sealed, unopened container

PREPARATION

Protect people, property, vehicles and all surfaces not set for treatment from spray, wind drift and fumes. Protect and/or divert pedestrian and auto traffic. Though Saltguard® WB has very little odor, avoid exposing building occupants to fumes. Maintain adequate ventilation when working on interior surfaces.

Thoroughly clean the surface using the appropriate PROSOCO product. Remove any curing compound or previous sealer. Contaminants on the surface, including curing compounds and previous sealers, may interfere with Saltguard® WB's ability to penetrate the surface.

Though Saltguard® WB may be applied to slightly damp surfaces, best performance is achieved on clean, visibly dry and absorbent surfaces. Excessive moisture inhibits penetration and reduces the service life and performance of the treatment. Clean newly constructed and repointed surfaces before application. Saltguard® WB won't impair adhesion of most sealing and caulking compounds. Always test for compatibility.

Protecting Window Glass

Protect window glass before using Saltguard® WB. Sure Klean® Strippable Masking is effective protection for use with this product. If protecting windows is impractical, follow these steps:

1. Clean window glass thoroughly before applying product to nearby concrete or masonry.
2. Do not use Saltguard® WB in wind or when air or surface temperatures are hotter than 95°F (35°C).
3. Try to keep product off the glass.
4. After treated surfaces have been protected from water for 6 hours, if product is on window glass, clean as soon as possible with soap and warm water. Alternatively use Enviro Klean® Klean 'N Release Cleaner or 2010 All Surface Cleaner to remove dried residues within 3–5 days.

Surface & Air Temperatures

Surface and air temperatures must be at least 40°F (4°C) during application and for 8 hours following, and should not exceed 95°F (35°C).

Higher temperatures evaporate the water carrier, reducing penetration and may result in an uneven appearance. Apply to shaded surfaces and before daytime air and surface temperatures reach their peak. Keep containers closed and out of sunlight when not in use.

If freezing conditions exist before application, let masonry thaw thoroughly. Subfreezing temperatures will freeze/crystallize Saltguard® WB, inhibiting penetration and significantly impairing results.

Equipment

Preferred method of application is with low-pressure (<50 psi), pump type spray equipment. Fan tips are recommended to avoid atomization of the material.

Storage & Handling

Keep from freezing. Store in a cool, dry place. Always seal container after dispensing. Do not alter or mix with other chemicals. Published shelf life assumes upright storage of factory-sealed containers in a dry place. Maintain temperature of 45–100°F (7–38°C). Do not double stack pallets. Dispose of unused product and container in accordance with local, state and federal regulations.

APPLICATION

Read "Preparation" and the Safety Data Sheet before use.

ALWAYS TEST each type of surface and coating for suitability and results before overall application. Include in the test area any previous repairs and patches, including aesthetic cementitious finishes. Different surface compositions may result in absorption and/or appearance differences. Test using the following application instructions. Let test area dry thoroughly before inspection. Over application or improper application may result in a slight darkening or mottled appearance.

Dilution

Do not dilute or alter material, or use for purposes other than specified. Mix well before applying.

Coverage Rates

Coverage varies based on substrate porosity and texture. Always test.

- 50–300 square feet per US gallon
- 5–28 square meters per US gallon

Vertical Application Instructions

For best results, apply "wet-on-wet" to a visibly dry and absorbent surface.

Spray Application: saturate from the bottom up. Apply enough for a 4 to 8 inch (15–20 cm) rundown below the spray contact point. Let the first application penetrate for 5–10 minutes. Reapply in the same saturating manner. Less material will be needed for the second application. **NOTE**: When spray applying to fluted architectural block, spray in an "overlapping X pattern" for complete coverage of recessed surfaces.

Brush or Roller: *Recommended for small scale application or when spray is not appropriate. Contact PROSOCO for more information.* Apply uniformly. Saturate the surface. Let product penetrate for 5–10 minutes. Brush out heavy runs and drips that do not penetrate.

Horizontal Application Instructions

NOTE: Always test for proper penetration on tightly troweled concrete, such as garage floors, where the tight finish or residual curing and sealing compound(s) may interfere with Saltguard® WB's ability to penetrate the surface.

1. Apply in a single saturating coat. Use enough to keep the surface wet for 2–3 minutes before penetrating. Do not over apply.
2. Broom out all puddles thoroughly until they penetrate the surface. Wipe up all excess material.

Dense Surface Application Instructions

Apply a single coat. Use enough to completely wet the surface without creating drips, puddles or rundown. Do not over apply. Test for application rate. When treating tightly troweled concrete, such as garage floors, always test for proper penetration before overall application. See "NOTE" above for Horizontal Application.

Drying Time

Treated surfaces will dry to touch within 1 hour. Protect surfaces from rainfall for a minimum of 6 hours following treatment. Treated surfaces will be ready for pedestrian and vehicle traffic in 24 hours. Water repellency of treated surfaces will increase for up to 14 days after application.

Cleanup

Clean tools, equipment and surfaces affected by over spray with soap and warm water.

Paint Adhesion

Surfaces treated with Saltguard® WB may be coated with silicone emulsion paints and many oil-based paints. Always test to assure adhesion. Adhesion may be improved if surface is pressure-rinsed and allowed to dry before application. Adhesion of some

BEST PRACTICES

For recommendations on removing stains and coatings, visit www.prosoco.com, call PROSOCO technical Customer Care at 800-255-4255 or contact your local PROSOCO field representative.

While Saltguard® WB can be applied as early as 3 days after concrete placement, best practice is to allow new concrete to cure 14 days before application. This improves product performance and reduces potential for an uneven appearance.

Do not apply when surface and air temperatures exceed 95°F (35°C). High temperatures evaporate the water carrier, reducing penetration and may result in uneven appearance. Apply to shaded surfaces and before daytime air and surface temperatures reach their peak. Keep containers closed and out of sunlight when not in use.

Recommended application is by high volume, low pressure (<50 psi) spray. Use a fan-type spray tip and adjust pressure to avoid atomization of the material.

For small scale application, or when spray application is not appropriate, brushes or rollers may be used. Contact PROSOCO for more information on brush/roller application.

Always test for proper penetration on tightly troweled concrete, such as garage floors. The tight finish or residual curing and sealing compound(s) may interfere with Saltguard® WB's ability to penetrate the surface.

On smooth, trowel-finished concrete, such as garage floors, PROSOCO's SLX100® or SL100 may be more appropriate.

Always saturate the surface uniformly. Give the treatment a few minutes to penetrate, but brush out pools and puddles quickly.

Never go it alone. If you have problems or questions, contact your local PROSOCO distributor or field representative. Or call PROSOCO technical Customer Care at 800-255-4255.

cementitious coatings, plaster, stucco, etc. may be adversely affected. Such surface treatments should be installed and allowed to thoroughly cure before installation of Saltguard® WB. Always test to verify compatibility between Saltguard® WB and other proposed surface treatments.

WARRANTY

The information and recommendations made are based on our own research and the research of others, and are believed to be accurate. However, no guarantee of their accuracy is made because we cannot cover every possible application of our products, nor anticipate every variation encountered in masonry surfaces, job conditions and methods used. The purchasers shall make their own tests to determine the suitability of such products for a particular purpose.

PROSOCO, Inc. warrants this product to be free from defects. **Where permitted by law, PROSOCO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of merchantability or fitness for particular purpose**. The purchaser shall be responsible to make his own tests to determine the suitability of this product for his particular purpose. PROSOCO's liability shall be limited in all events to supplying sufficient product to re-treat the specific areas to which defective product has been applied. Acceptance and use of this product absolves PROSOCO from any other liability, from whatever source, including liability for incidental, consequential or resultant damages whether due to breach of warranty, negligence or strict liability. This warranty may not be modified or extended by representatives of PROSOCO, its distributors or dealers.

CUSTOMER CARE

Factory personnel are available for product, environment and job-safety assistance with no obligation. Call 800-255-4255 and ask for Customer Care – technical support.

Factory-trained representatives are established in principal cities throughout the continental United States. Call Customer Care at 800-255-4255, or visit our website at www.prosoco.com, for the name of the PROSOCO representative in your area.

Historic Preservation

Clean and Restore Valuable Structures and Artifacts

Sponge-Jet's various and unique features combine to offer the preservation industry an invaluable tool. More than ten-times as fast as manual cleaning – more gentle than water or abrasive blasting. Used on:

- Churches, stadiums and historic buildings
- Statues, monuments and sculptures
- Limestone, sandstone, marble, granite, brick, terracotta and tile
- Bronze, brass, copper, gold, wrought iron and delicate castings
- Wood beams
- Selective stripping and removal of smoke, soot, and graffiti

Sponge Media™ cleaning and restoration products provide professionals with surgical-like control for a wide range of cleaning and restoration work. The media's engineered capabilities range from gentle cleaning to micro-abrasion, with Sponge-Jet Feed Unit™s propelling the media at pressures so low, one can clean paper.

Features & Benefits

- Simplify job staging
- Protect integrity and reliability of assets
- Less disruption to the community
- Reliability of schedule and budget
- Lower project costs
- Green and sustainable, at lower cost