Attachment 1

Special Design Review Committee
Of the Saint Paul Heritage Preservation Commission
445 Smith Avenue N.
September 2, 1025
10:00 AM

Agenda of Items to Discuss:

I. **ADA Access: Access, siting, detailing**

II. **Brewing Addition: Siting, setback, massing**

III. **Replacement of 1880s addition, conjectural elements**

IV. **Mitigation Plan for removal of 1880s addition**

Commission members: Please call 651.266.9078 if unable to attend.

Special Design Review Committee
of the Saint Paul Heritage Preservation Commission
445 Smith Avenue N
September 2, 2015

RF=Robert Ferguson
DTO=Diane Trout-Oertel
DW=David Wagner
TS=owner Tom Schroeder
JY=architect John Yust
AS=staff Amy Spong

RF- brewing portion: location, height, massing
TS – want resolution that proposal can work

I. ADA Access: Access, siting, detailing

JY – spent quite a lot of time since last time talked

TS – Wants front entrance to be primary entrance now

JY – 63' of ramp; 3' elevation change; not clear on railings

DW – stretch out toward back of the site; minimize impact of ramp stretching along sidewalk

JY – stretching it back would create a barrier to add green space in future

TS – outdoor seating eventually in green space

DTO/DW – wind an ADA ramp around a nice garden and/or future seating area

DTO – more naturalistic landscape

DW – need survey with topo information. Need to discuss it more.

JY – He did explore an alley side ramp – needs 50' – only have about 42' – need 60' ramp to get to front entrance

RF – TS mentioned last night (at site visit) a sunken area? – preserved limestone foundations of double house for sunken seating area

JY – raised question of a lift instead or a ramp

DW – not dignified for users

TS – will refine ramp get revised version

DW – highly recommend having topography and grading plan

JY – all floor height are the same from stone to the back brew barn

II. Brewing Addition: Siting, setback, massing

TS – "brew barn" never considered putting on side yard or up to the sidewalk
– struggled to keep roof down, footprint tight

--went through iterations A-L

--brought in kitchen and brewing designer

--explored going below ground - not restrooms – cost is exorbitant (bluff)

–"basement was planned for Palmer House but only got down to 42 inches"

DW – sketch a section based on width and height

--not worried about the height of the peak – it's the height of the eave – makes if feel very large

--"overall wall height" how to make it feel less of an impact on overall massing

DTO – switch to glass to minimize scale

--contemporary nature could be a benefit

RF – glass would be an attraction – now it's quiet – don't mind height or massing

DTO – could handle some of the massing with landscaping

RF –doesn't agree with that

DW – color of the brew barn will help with massing - dark gray allows contrast with the stone portion

DTO – might be okay with making barn longer, more kitchen out of vestibule and lowered eave height on brew barn

DW – would have no problem making the building longer to shorten vestibule to make the brew barn feel more detached

DW – interior is sensitive but not seeing anything in the plan that couldn't lose some height on the eaves

JY – looked at different roof forms – two tiered Mansard

DW – gambrel? not exactly

JY – keep it more simple and barn like

AS – lower [floor] just brewing side of the barn [given it's an open two-story space]?

JY – he really pushed to keep everything on same level

--concerns with cleaning and staircase

DW – lowering eave line is a good thing

RF – doesn't mind the eave line or extending farther south if eave is brought down

RF – roof form – simple barn character important

--makes it a background building

DTO – elongating is a good idea – gives some breathing room

--likes a small clear vestibule

--likes simple 6/12 roofs on everything

--would like to see the Palmer House moved on [same] site and used as the kitchen and bathrooms

TS – he doesn't own the Palmer House anymore, developer put in thousands and it will be restored in a new location

--weigh pros/cons

– his priority to now has been the Palmer House

DTO – all of the additions should be simple – keep new 1880's addition simple

DW – Lundie-esque- door with chevron pattern – not appropriate

--keep color very monochromatic no distinct trim even on the 1880's replacement

--roof drop a bit

--color scheme dark gray or black [to distinguish old from new]

DW –[new buildings should] "just be a shadow"

--[get vestibule to a] singular corridor – then it can be glassy and 10' – 12' added onto brew barn

JY – 2 issues – 1. hard time lowering eaves – will ruin 2nd floor

JY – [handed something to DRC]

DW – transparency between 1880 and brew barn a high priority

RF – doesn't mind more transparency – makes the barn an attraction

JY – happy to explore ADA ramp, ask for leniency for having a final design

III. Replacement of 1880s addition, conjectural elements

DW – replacing with fake history, sets apart to trained eye

--encourages using 1/1 windows

--don't mind clapboard siding, simple corner boards, simple eave, double-hungs – someone isn't drawing conclusions

TS – don't want to confuse

--[looked at] other [historic] examples in neighborhood – windows are divided light – are the eyes of the building, appears less vacant

--screams I'm different

--6 over 6 and solid glass on rear?

--wants some divided light softens it

DW – 2 over 2 too conflicting

RF – don't be so rigid in thinking of style – Federal style not used until 1922

--masons thinking in terms of Greek Revival – trying to design a convincing period

--encouraging replication and not replicating it

--same footprint

--changes roof pitch

--details are compatible

DW – interpretation almost more important than what does or does not

–we don't talk enough about training people about interpretation

JY – showed pictures of other "examples" in the neighborhood

--totally comfortable, really strongly about [current 1880's replacement proposal]

--appropriate awning windows under eaves that relate to other historic buildings

--not made up – would be so offended if forced to use 1 over 1

--totally offended

DW – job to not replicate history as it didn't exist

--[people will] assume its original fabric

--splitting hairs to a certain extent, very subjective

TS – other elements that might mitigate

DW – not attempting to be dogmatic about it

treat this addition with the same color on barn and assimilate the two

DTO – no problem with 6 over 6 windows – does have a problem with belly up [awning] windows

RF – likes the monochromatic paint scheme for the additions

DW – [1880's replacement] addition doesn't have historic authenticity

--don't quite fit in

TS – phasing – rear addition this fall

Process – October 8 meeting

IV. Mitigation Plan for removal of 1880s addition

Bob Frame put together a mitigation plan submitted

Attachment 2
Application w/
revisions

Summary of Changes—HPC Design Review
445 Smith Ave/Stone Saloon
(comparing Aug. 27 and Oct. 8, 2015 submissions)

This memorandum responds to HPC staff's request for a written summary of changes made to our August 27, 2015 Design Review submissions. These changes were informed by the HPC's staff report, comments made by commissioners at the August 27 HPC meeting, and input received at our September 2 meeting with HPC's Design Review Committee (DRC). We look forward to discussing these changes further with the Commission at its October 8 meeting.

Changes to the Site Plan:

- **Our previous site plan showed ADA access to the south side entrance of the rear wood frame addition, with a return-ramp along the sidewalk. At the HPC's August 27 meeting, one commissioner encouraged us to make the front entrance to the building ADA accessible. Staff and at least one member of the DRC suggested an ADA ramp further back from the sidewalk with a more naturalistic pathway to the entrance. The site plan now shows two alternative ADA options, "Option 1" accessing the building's front entrance, and "Option 2" accessing the side entrance. The owner is open to both but favors ADA access to the front.**
- **There was a discussion at the DRC meeting regarding the potential reuse of limestone foundation walls that the owner has preserved beneath grade from a former house on the lot that was removed in 2011 (e.g., for future seating areas, landscaping effects, etc.). While nothing is currently proposed for these structures, they are now referenced on the site plan and their relationship to the ADA ramp is shown.**
- **We added the location of a limestone masonry-lined well recently discovered beneath the cottage formerly located at 447 Smith. This well could date from the mid-19th Century.**
- **At least one member of the DRC encouraged us to show another option for the brew barn that lowered the eave height to the approximate height as the rear wood frame addition. To the extent this change reduced the usable space of the brew barn's second story, it was suggested that the building's footprint could be enlarged. The revised site plan shows this new option as a dotted line to the south of the brew barn increasing the length (but not the width) of the "Option 2" building from 48 to 58 feet. (see further discussion below).**
- **We have now included a topographical survey of the historic site.**

Changes to the Frame Addition:

- **We have removed the porch previously shown but now eliminated from our proposal.**

- **The South side door and window have been reconfigured, with the door now at the center opening.**
- **In the first floor interior, we have removed the door previously shown at the stair landing in order to conform to code.**
- **The DRC discussed the second story awning windows and the number of lights in the main windows. There was no clear consensus among DRC members: two members supported the awning windows and multi-light (6-6) windows as drawn, while the third member favored eliminating the awning windows and using fewer or no divided lights in the main windows. The owner and architect propose to retain the awnings and multi-light windows as drawn, due to their pleasing appearance and compatibility with other 6-6 windows in the surrounding area, as well as the functional lighting provided by the awning windows on the second story.**
- **The DRC also discussed the return eaves. Again there was no clear consensus. Return eaves are present on several other buildings in the surrounding area (goes to standard of compatibility), and the architect feels strongly about his design intent on this issue.**

<u>Brew Barn Elevations and Floor Plans (Options 1 & 2)</u>:

- **One member of the DRC asked us to explore an alternative design for the brew barn incorporating lower roof eaves, and expanding the footprint as necessary to make up for any loss of usable space on the second level. To satisfy this request, we reconvened the kitchen designer, brewery designer and general architect and worked through several additional iterations of the design which variously incorporated steeper roof pitches and/or a lowered roof peak in order to lower the roof eaves. A recommendation was also made at the DRC meeting to narrow the vestibule between the rear addition and the brew barn and make it more transparent. Elements of the resulting alternative ("Option 2") include:**
  1. **Removing kitchen equipment and functionality from the vestibule and reorienting the kitchen on a North/South axis entirely within the lengthened brew barn space.**
  2. **Moving from a 6/12 roof pitch to a 8/12 roof pitch in order to lower the eaves.**
  3. **We explored lowering the roof peak, but when this was done to any material extent, the second floor became largely unusable, requiring a much greater expansion of the footprint of the building. Accordingly, in an effort to balance these concerns, Option 2 has the same peak height as Option 1.**
  4. **We have shown the vestibule as transparent glass. To further enhance this transparency, Option 2 removes the kitchen equipment from the vestibule and lowers the vestibule dividing wall to a half-wall.**
  5. **The Option 2 vestibule is narrower than the Option 1 vestibule to further differentiate the rear addition and the brew barn.**

6. **The cumulative effect of these design changes increases the length of the Option 2 brew barn by 10' on the North-South axis, making the building 26'x 58'.**

- **Having thoroughly explored Option 2, the owner continues to favor Option 1 as originally proposed. Any benefit achieved by lowering the eaves appears to be largely outweighed by the need to substantially lengthen the building's footprint to the south—the area of greatest visibility from the public right of way. Option 1 is somewhat more hidden from public view, and more effectively keeps the spotlight on the historic stone structure. Moreover, preliminary calculations indicate that the increased manufacturing square footage in Option 2 would require one additional off-street parking stall, which the owner is currently unable to provide.**

Alterations,
Stone Saloon Submission
to the Historic Preservation Commission
September 22, 2015

After reviewing the submission documents with the HPC Design Review Committee, a number of alterations were made to the proposed drawings.

Site Plan:

- **We were encouraged to bring all customers through the front door, making the front door ADA accessible. (done)**
- **We added the old basement locations for the double house that was removed in 2011. While nothing is currently proposed for these (underground) structures, we felt it prudent that the ADA ramp take into account the location of these structures. (done)**
- **We added the location of a newly discovered limestone masonry-lined well that could date from the earliest decades of the sites use. (done)**
- **We were asked to show another option for the brew barn, specifically, one that lowered the eave height by increasing the building's footprint (making the building 26'x 58'). This new option is shown as a dotted line to the south of the brew barn. (done)**
- **We have contracted for a new survey showing the topography of the historic site. (survey field work complete, but survey not yet received)**

Frame Addition:

- **We were asked to remove the porch. (done)**
- **South side door and window reconfigured. (done)**
- **First floor, removed door from stair landing in order to conform to code. (done)**
- **The Design Review Committee discussed the awning windows and number of lights in the main windows. There was no clear consensus among DRC members: two seemed apparently**

supported the multi-light windows as drawn, while another committee member favored fewer or no divided lights. The owner and architect favor the awnings and multi-lights (6-6) drawn, not in order to emulate any particular historic style, but because of their aesthetics and compatibility with other multi-light windows in the immediate area and surrounding neighborhood. For these reasons, the windows were left as originally proposed. (done)

- **The Committee also discussed the return eaves. Again there seemed to be no clear consensus. The architect feels strongly about his design intent on this issue so eaves were left as originally proposed. This is a new building and compatible with many buildings in the area. (done)**

Brew Barn:

- **We were asked to explore and present an alternative design incorporating lower roof eaves, expanding the footprint as necessary to make up for the lost usable space on the second level. The kitchen designer, brewery design and general architect met several times and cycled through several potential iterations of the brew barn incorporating these objectives. Elements of the resulting alternative include:**
  1. **To orient the kitchen in a North/South axis, rather than a East/ West axis. (done)**
  2. **To lower the roof eave, this alternative moves from a 6 / 12 roof pitch, to a 8 / 12 roof pitch. (done)**
  3. **We explored lowering the roof peak, but found that when this was done to any material extent, the second floor became largely unusable. (not done)**
  4. **To make the connector between the frame part and brew addition more transparent (glass). With that goal in mind, the alternative also removes kitchen equipment from this area. (done)**
  5. **The cumulative effect of these design and functional changes increase the size of the building foot print by 10' on the North-South axis, making the building 26'x 58'. (done)**

* Original Application w/same & revised plans

Saint Paul Heritage Preservation Commission
Department of Planning and Economic Development
25 Fourth Street West, Suite 1400
Saint Paul, MN 55102
Phone: (651) 266-9078

HERITAGE PRESERVATION COMMISSION
DESIGN REVIEW APPLICATION

This application must be completed in addition to the appropriate city permit application if the affected property is an individually designated landmark or located within an historic district. For applications that must be reviewed by the Heritage Preservation Commission refer to the HPC Meeting schedule for meeting dates and deadlines.

1. CATEGORY

Please check the category that best describes the proposed work

- ☑ Repair/Rehabilitation
- ☐ Moving
- ☑ Demolition
- ☐ Sign/Awning
- ☐ Fence/Retaining Wall
- ☐ Other _____
- ☑ New Construction/Addition/ Alteration
- ☐ Pre-Application Review Only

2. PROJECT ADDRESS

Street and number: 445 Smith Ave Zip Code: 55102

3. APPLICANT INFORMATION

Name of contact person: Tom Schroeder

Company: _____

Street and number: 194 McBoal St.

City: St. Paul State: Mn Zip Code: 55102

Phone number: (612) 385-8838 e-mail: tom.schroeder@faegrebd.com

4. PROPERTY OWNER(S) INFORMATION (If different from applicant)

Name: n/a

Street and number: _____

City: _____ State: _____ Zip Code: _____

Phone number: (____)_____ e-mail: _____

5. PROJECT ARCHITECT (If applicable)

Contact person: John Yust

Company: _____

Street and number: 256 Goodrich

City: St. Paul State: Mn Zip Code: 55102

Phone number: (651) 290-2411 e-mail: jhyust@hotmail.com

6. PROJECT DESCRIPTION

Completely describe ALL exterior changes being proposed for the property. Include changes to architectural details such as windows, doors, siding, railings, steps, trim, roof, foundation or porches. Attach specifications for doors, windows, lighting and other features, if applicable, including color and material samples.

See attached

Attach additional sheets if necessary

7. ATTACHMENTS

Refer to the *Design Review Process sheet* for required information or attachments.
****INCOMPLETE APPLICATIONS WILL BE RETURNED****

ARE THE NECESSARY ATTACHMENTS AND INFORMATION INCLUDED?

☐ **YES**

Will any federal money be used in this project?	**YES**	____	**NO**	X
Are you applying for the Investment Tax Credits?	**YES**	____	**NO**	X

I, the undersigned, understand that the Design Review Application is limited to the aforementioned work to the affected property. I further understand that any additional exterior work to be done under my ownership must be submitted by application to the St. Paul Heritage Preservation Commission. Any unauthorized work will be required to be removed.

Signature of applicant: Thomas Schroeder **Date:** 8/20/15

Signature of owner: (same) **Date:** _____

FOR HPC OFFICE USE ONLY

Date received: 8.20.15 **FILE NO.** _____

Date complete: _____

District: Stone /Individual Site: _____

Pivotal/Contributing/Non-contributing/New Construction/Parcel:

Type of work: Minor/Moderate/Major

____ **Requires staff review**

Supporting data: **YES** **NO**
Complete application: **YES** **NO**

The following condition(s) must be met in order for application to conform to preservation program:

It has been determined that the work to be performed pursuant to the application does not adversely affect the program for preservation and architectural control of the heritage preservation district or site (Ch.73.06).

_____
HPC staff approval

Date _____

X ____ **Requires Commission review**

Submitted:
- ☐ 3 Sets of Plans
- ☐ 15 Sets of Plans reduced to 8 ½" by 11" or 11" by 17"
- ☐ Photographs
- ☐ CD of Plans (pdf) & Photos (jpg)
- No ☐ City Permit Application
- ☐ Complete HPC Design Review application

Hearing Date set for: _____

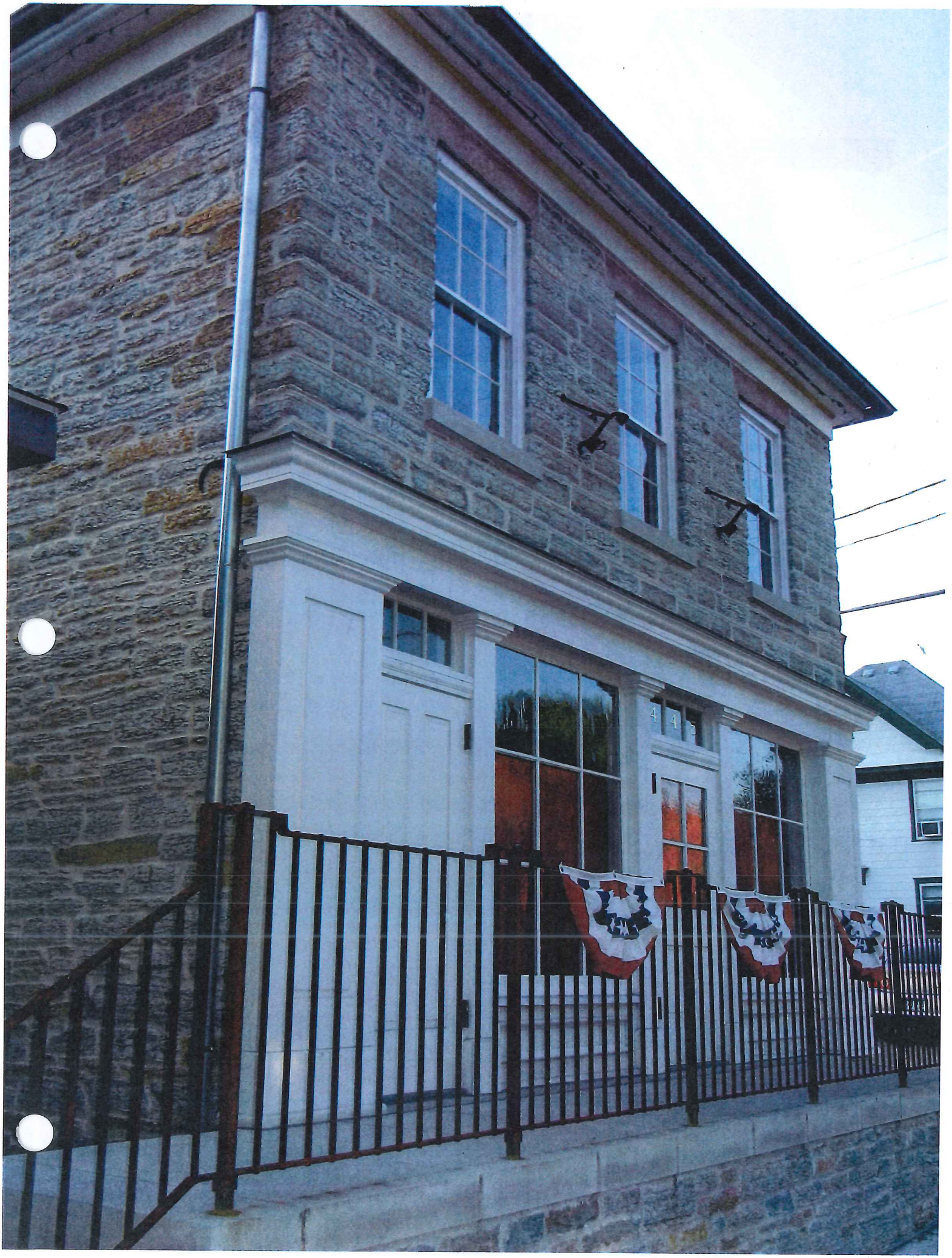
City Permit # ____ - _____

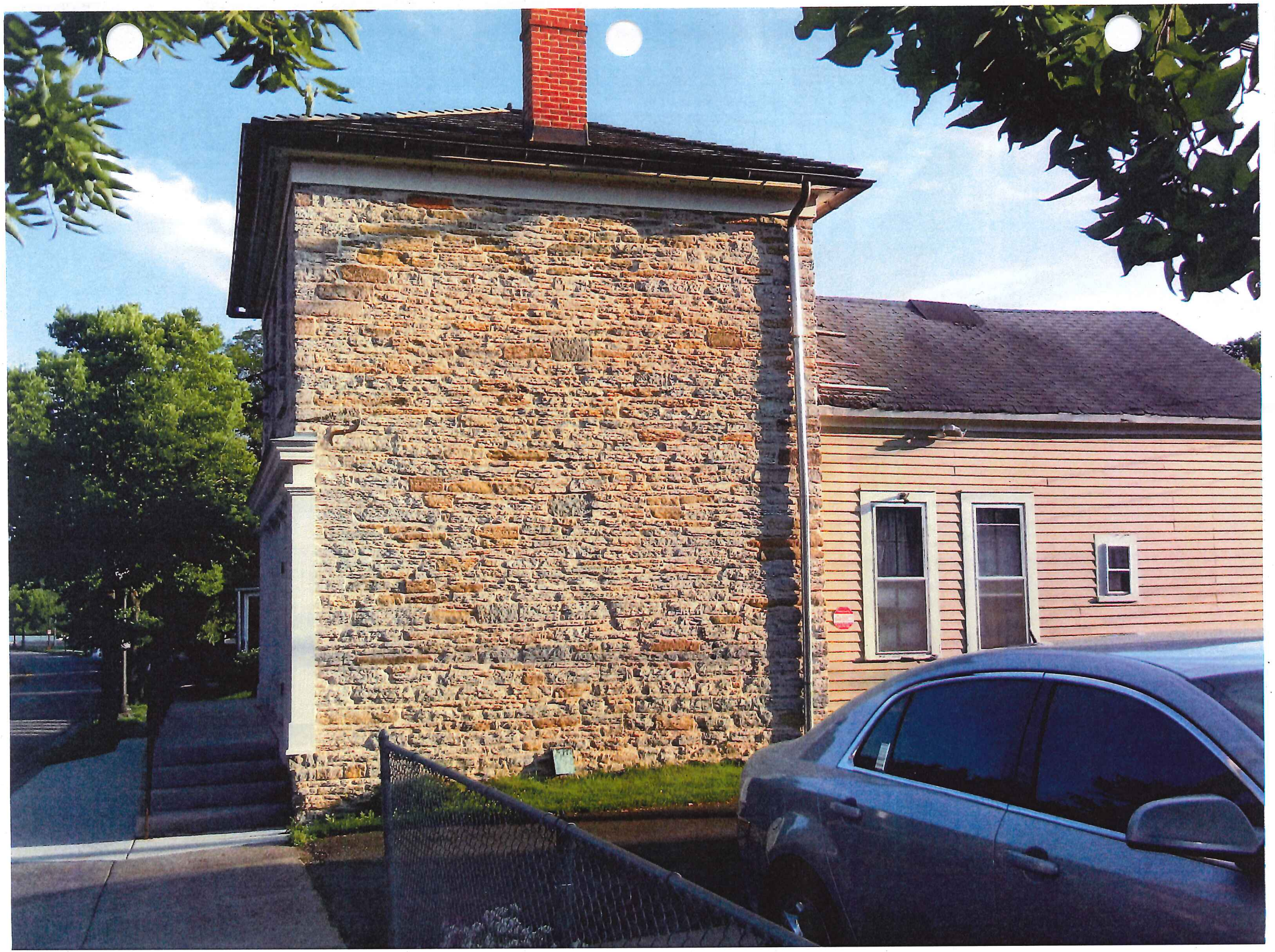
Attachment to Design Review Application
(445 Smith Ave)

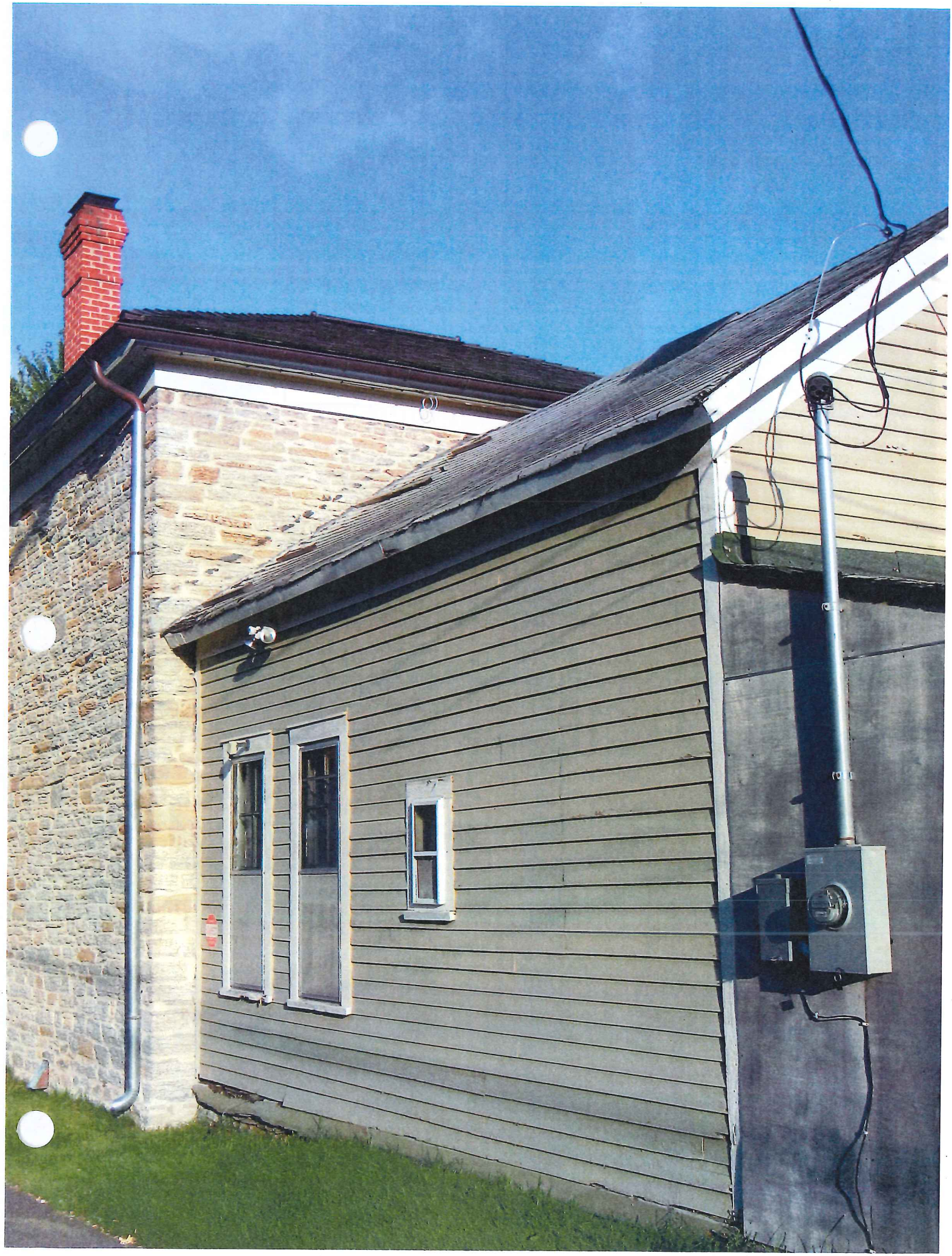
Rear wood frame addition: With the approval of the HPC, we propose to reconstruct the rear wood frame addition to the stone building in accordance with the Secretary of Interior's Rehabilitation Standards and the preservation program for the site. (See rear addition plans and elevations, previously submitted). Our decision to replace the rear addition "in-kind" has been informed by an extensive structural analysis by a qualified engineering firm. This analysis concluded that too much existing material—approximately 80 percent—would need to be replaced or strengthened with additional new material for repair to be feasible and prudent. (See Align Structural, Inc. report dated 8/19/14; Memo by Historian-Consultant Bob Frame to Amy Spong, Christine Boulware, HPC dated 8/19/14, previously submitted). Nevertheless, replacement of the rear addition "in-kind" will yield a reconstructed addition with the same footprint, floor levels, ceiling heights, roof peak, and interior stairway placement as the existing structure. As show in the plans and elevations, the exterior features of this addition have been designed in the Greek Revival style prevalent during the 1850s and 1860s and evidenced both at this site and other Greek Revival structurs included within the Stone Saloon's thematic designation (Christian Reinhardt House, 383 Goodhue; Martin Weber House, 202 McBoal) and located within the immediate area (e.g., Avery Adams House, 454 Smith; Schneider-Bulera House, 365 Michigan). The submitted plans alter the roof pitch of the circa-1885 addition now in place. However, the reconstructed roof pitch will match the pitch of the predecessor addition's historic, Greek Revival pitch (6"/12") which characterized the building throughout the Waldman era (circa 1860-1885). This original Greek Revival pitch is clearly traced in the masonry along the interior rear façade of the stone building.

Newly constructed building: We propose to construct a new building at the backlot which will be connected to the reconstructed wood frame addition of the historic structure by a vestibule. The new building will house the brewery equipment, kitchen, restrooms, storage, utilities and office. (See site plan and elevations, previously submitted). The placement of these functions in a newly constructed building minimizes the impacts they might otherwise have on the integrity of the historic building. The new building and its connecting vestibule are designed to clearly differentiate themselves from the historic structure, while keeping with the character of the site and of other 19th accessory buildings in the area. The positioning of the new building at the backlot and the use of landscaping effects (including hop trellises along the south and east exterior walls of the new building) will keep the spotlight on the historic structure in front. Every design and engineering effort has been made to minimize the scale of the new addition, including employing stacked, horizontally mounted fermentation and lagering tanks, a ceiling trolley to maximize storage efficiency, and a highly compact kitchen preparation area. Finally, the new building will occupy nearly the identical footprint of an alley-house that once sat in the same location behind the Stone Saloon from 1874 to 1898. The positioning of the new building therefore relates to the historic context of the site during the final eleven years of the Waldmans' residency. We do not seek full/final design review for the new building at this time, but instead are seeking the Commission's approval of the plans and elevations of this structure as submitted, which show its location, height, massing, roof pitch and other design elements as depicted.


Charles Palmer House, Built in 1874
445





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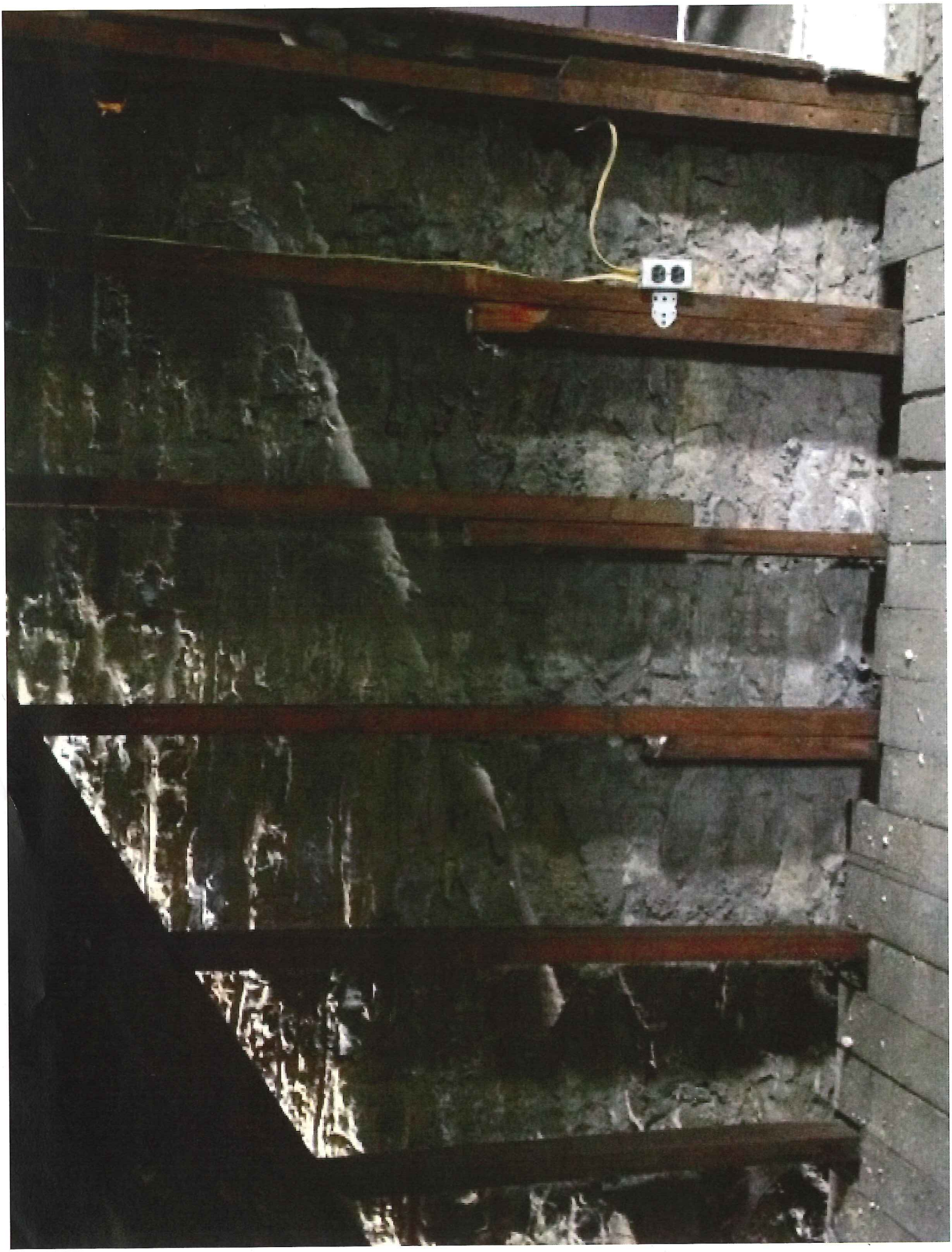
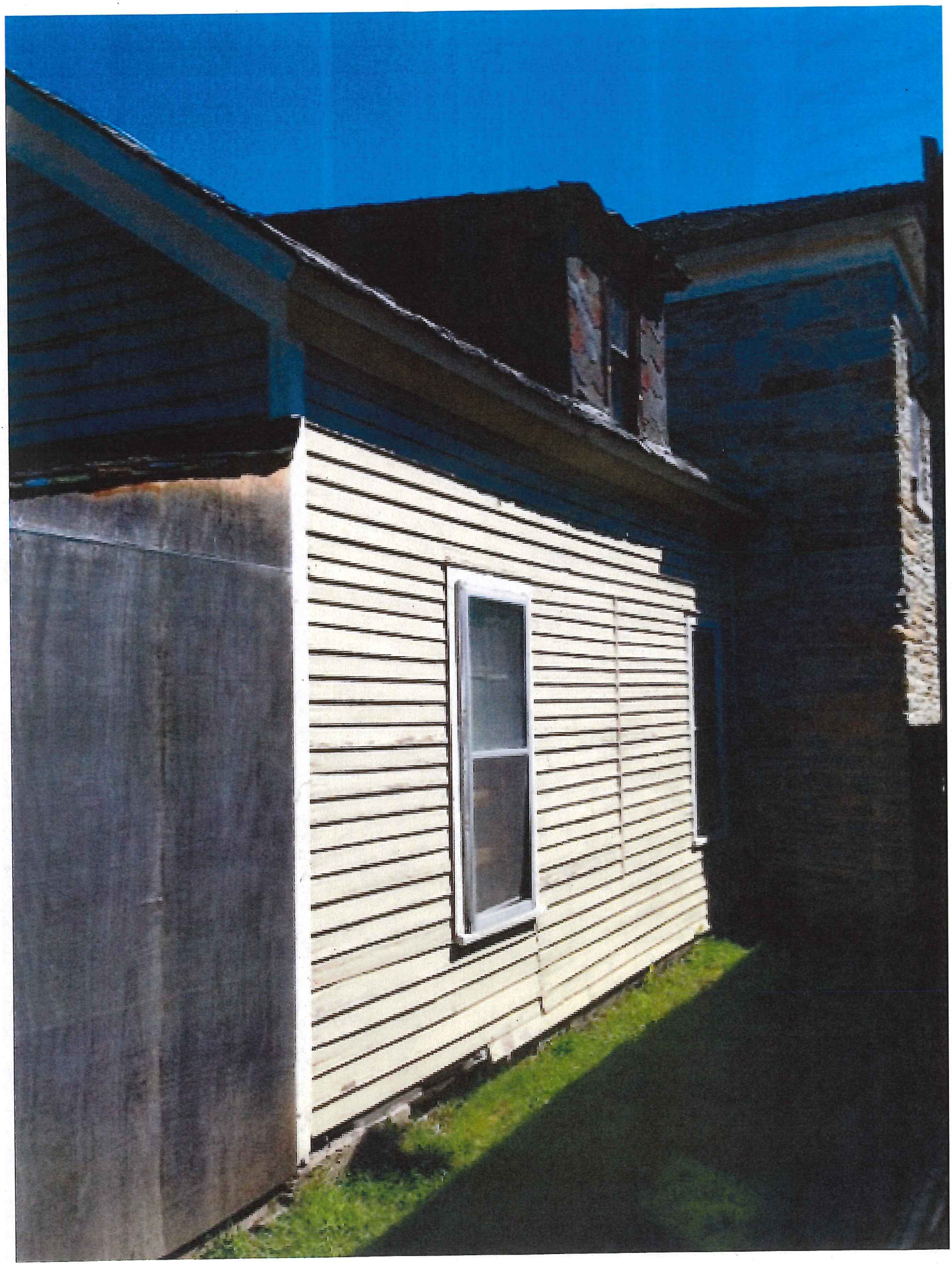
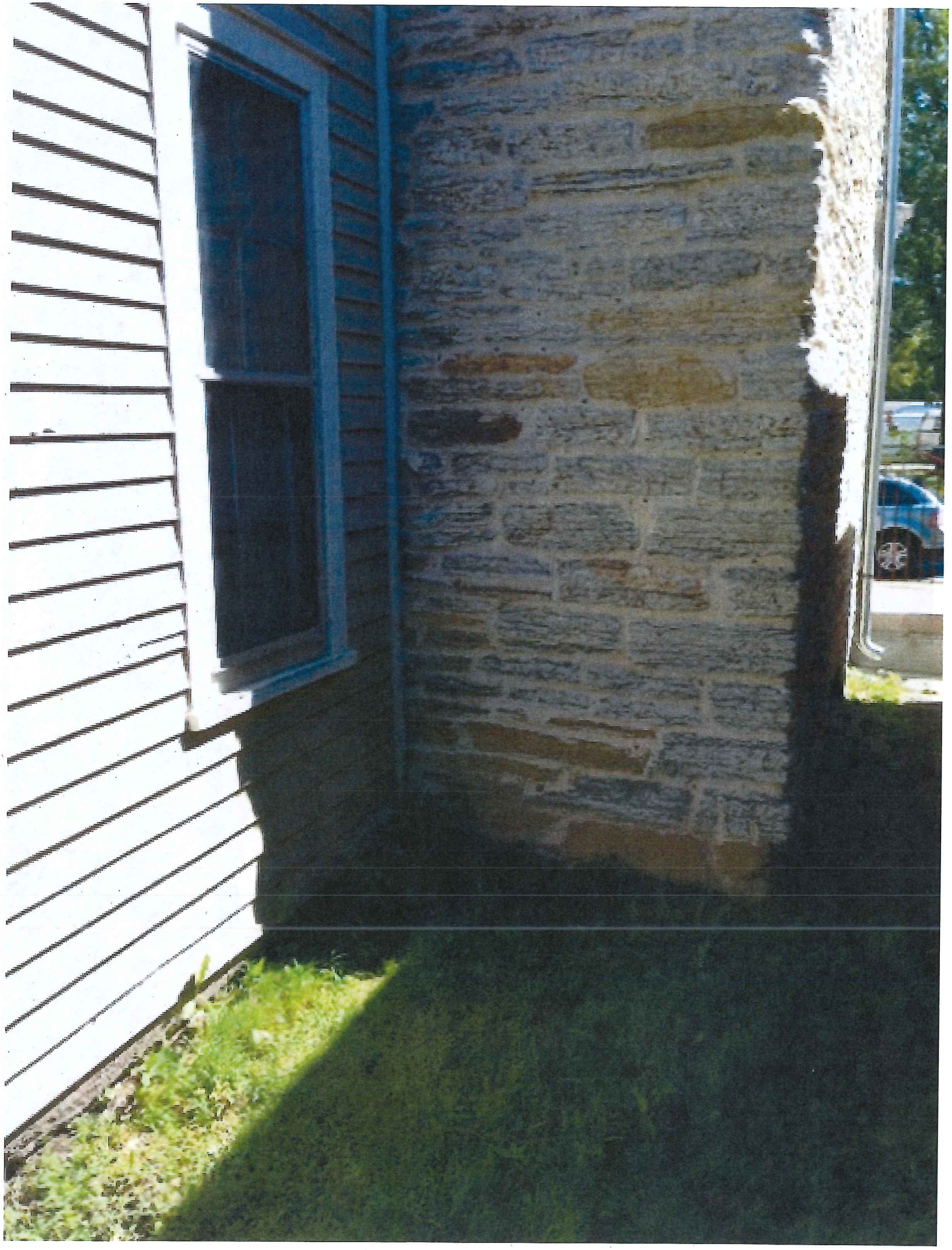
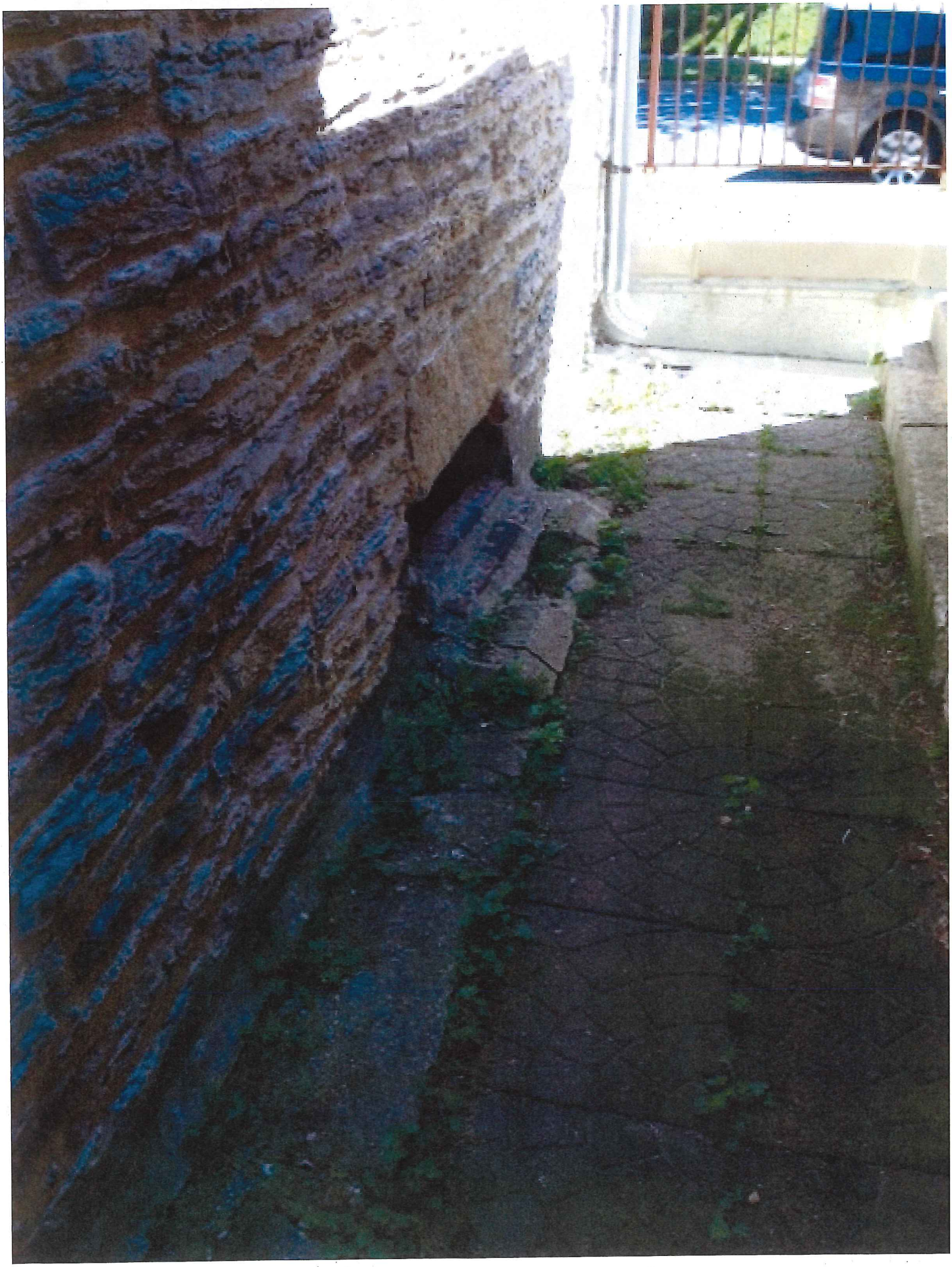









Charles Palmer House, Built in 1874

TO: Amy Spong, Christine Boulware, Saint Paul HPC
FROM: Bob Frame, Historian
DATE: August 21, 2014
RE: Structural engineer's evaluation of 445 Smith addition

I have read Richard (Rick) Johnson's structural evaluation of the wood-frame addition at 445 Smith on behalf of Tom Schroeder, with particular attention to the recommendations added in red. I also walked through the addition with Rick briefly, we discussed the findings he was preparing for the report, and he answered any questions I had. Listed below are the items that I find important in considering the possible repair, rehabilitation, and/or restoration of the structure. The report is limited to a structural evaluation by a registered engineer and does not attempt to be an architectural or historic evaluation. Nevertheless, as an engineer experienced with historic structures, he is aware of the fundamental requirement to preserve historic fabric and to repair rather than replace. From my perspective, this document provides a necessary baseline for determining the potential for repair or rehabilitation of the complete addition. Here are key points:

- Johnson concludes (section 8.B) that 20% of existing structural materials in the entire structure can be reused in their current structural configuration in any repair or rehabilitation effort. That percentage includes material of any age, some of which is not 50-year-old historic fabric.
- Most of the 20% is comprised of vertical wall studs, 70% of which can be reused in their existing structural configuration (7.E.1). This does not include the exterior wood board sheathing, which cannot be reused as structural material (7.E.2).
- Of the structural system for the two floors, only the second-floor joists can remain, but must be paired with new companion joists for adequate structural floor support (7.C.i, ii and appended sketch SK1). Like the exterior wood sheathing, the second-floor floorboards cannot be reused as structural material.
- No part of the main (first) floor system can be reused in a structural capacity, including the stone foundations, floor joists, and floorboards (7.D.i,ii,iii).
- The roof framing system cannot be reused, largely because of existing fire damage (7.A), but would not be structurally sufficient even if in sound condition.
- The interior stair cannot be reused structurally, or reconstructed in the same location without alterations to other parts of the structure (7.B).

This evaluation indicates that the addition, in its current structural condition, does not meet the State Building Code. At the same time, too much existing material—about 80%--must be replaced or be strengthened with additional new material for a repair to be feasible and prudent. Anything approximating a repair would essentially be new construction incorporating wall studs and some floor joists. Some existing material, or historic fabric, may be removed and salvaged, but its reuse would be in an aesthetic capacity and not necessarily in its original location or even in its original size and configuration.

If the structure cannot remain in its existing condition, and cannot feasibly be repaired using existing structural materials, the evaluation points to documentation and removal. The removal would be followed by new construction, if a replacement structure were desired. The approach to the design of a replacement structure would be a subsequent step, but consideration of an in-kind replacement to the extent possible would be the preferred approach to be in conformance with the Secretary of the Interior's Standards.

I'm happy to answer any questions (763-370-1803 or *rframe@alumni.ksg.harvard.edu*).

ALIGN Structural, Inc.

241 CLEVELAND AVENUE SOUTH
SAINT PAUL, MINNESOTA 55105-1255
t 651.698.0164 | f 651.698.0165

Yust Architectural Services
476 West 7th Street
Saint Paul, MN 55102
Attn: John Yust

August 19, 2014

Re: 445 Smith Avenue-Structural Investigation
Saint Paul, MN
Project #14246

Note: I have prepared this letter as a supplement to my original letter dated August 5, 2014. I have added recommendations for reinforcement or replacement of existing framing and foundation materials "in kind" to my original observations of the condition of the existing materials. These latest recommendations and comments are noted in red.

Background

At the request of Yust Architectural Services, I made a visit to the referenced building on August 4, 2014. The purpose of the visit was to perform limited visual observations of the existing framing and foundations of the structure. I have prepared this letter to report my observations and to provide opinions regarding the existing structural materials in light of the current development of the site by Tom Schroeder.

Observations and Opinions

1. **Roof**
   A. Roof rafters were 1.875"x4" spaced at 25" on center
      - Members would be 64% overstressed in bending under residential loads per the latest edition of the Minnesota State Building Code (MSBC)
      - Members would be 74% overstressed in bending under commercial loads per the MSBC
      - Live and total load deflections under residential and commercial loads would not comply with the deflection limits per the MSBC

   B. Rafters were damaged by fire throughout the building, with the heaviest damage near the center and west ends of the space (Photo 1). The fire appeared to have caused a significant loss of cross section of many of the rafters and roof sheathing materials.
   C. Roof sheathing was .875" thick wood decking that was placed in various widths. The sheathing had randomly spaced gaps between the boards (Photo 1). There were conditions where the gaps between the sheathing boards were practically tight and there were conditions where I measured 1.5" wide gaps.
   D. There were gaps between the rafters at the roof peak that appeared to indicate spreading of the roof (outwards movement of the exterior stud walls). The gaps were more open at the base relative to the typically tight condition between the rafters at the top. This type of movement was much more severe

at the rafters on the west end of the building. At this location the rafters and the exterior wall sheathing had completely separated exposing a gap that was approximately 1.75" wide (Photo 2).

E. There was a noticeable deflection of the rafters. The deflection could be observed from the interior and exterior of the building. I confirmed the deflection with measurements of the slope of the rafters.

F. The dormer along the south side of the roof did not appear to be original to the building. In addition, the following conditions at the dormer made it appear that there was little to no effort made to take care of the structural loads associated with this change to the original roof:
   - There was no lintel where the dormer was cut into the rafters
   - The full span rafters were not reinforced on either side of the dormer
   - There was no lintel above the window opening on the exterior wall at the dormer

G. There were signs of moisture infiltration on the rafters and studs in many locations throughout the upper level.

H. General structural condition of roof in light of proposed development of building:
   i. The roof rafters were too badly damaged by fire and moisture infiltration to reuse the members for any proposed development of the structure. In addition, the members would require significant reinforcement to support loads per the MSBC.
   ii. The current dormer condition would require significant structural reinforcement to support loads per the MSBC (for residential or commercial use of the building). There was almost a complete lack of any framing materials at this location and all structural elements to support the dormer would be new materials.

I. Recommendations for reinforcement or replacement of existing roof structure in kind
   i. The existing roof framing and sheathing materials would need to be removed due to the extent of the fire damage and cannot be reused.
   ii. Option 1 for replacing the existing roof framing: Provide new wood roof trusses at 24" on center with new 5/8" thick plywood sheathing. Due to the raised ceiling condition there would need to be special consideration for resisting the horizontal forces at the truss bearing conditions along the tops of the exterior stud walls.
   iii. Option 2 for replacing the existing roof framing:
      - Provide a new (3) 1.75"x18" LVL or W14x22 ridge beam- it should be noted that the span of the ridge beam would require relocation of the original chimney stack.
      - Provide new 2x8 rafters at 16" on center
   iv. The dormer along the south side of the roof would require all new framing- framing along the perimeter of the roof penetration at the dormer would be (2) 1.75"x7.25" LVL beams

2. Stairs

A. There was limited clearance at the top of the stairs

B. The treads of the stairs were plywood which would not have been an original material in the building

C. There did not appear to be a reasonable system of stair framing to properly transfer the stair loading to the main floor and foundation system below. Stair stringers were not evident and beams at the upper landing to support the stringer system were lacking.

D. General structural condition of stairs in light of proposed development of building:
   i. It does not appear that a workable stair configuration with proper clearances would be possible in the current stair location without a significant remodel of the existing roof structure above.
   ii. A completely new framing system would be required to support stair loads per the MSBC.

E. Recommendations for reinforcement or replacement of existing stair structure in kind

i. The existing stair framing would need to be removed due to the lack of a true structural system with a load path that transfers loads to the foundations. The existing framing members cannot be reused.

ii. The new stairs would require new stringers and treads/risers.

iii. The new stair would need to be relocated in the footprint of the building due to clearances at the head of the stair that are not code compliant, or the roof would need to be remodeled to provide proper clearances per the MSBC. If the roof is raised in this portion of the building, this would create snow drift conditions due to the new high/low roof framing planes.

3. Second Floor Framing

A. Floor joists were 1.875"x5.75" spaced at 16" on center

- Members would be 159% overstressed in bending under residential loads per the MSBC
- Members would be 417% overstressed in bending under commercial loads per the MSBC
- Members would be 94% overstressed in shear under commercial loads per the MSBC
- Live and total load deflections under residential and commercial loads would not comply with the deflection limits per the MSBC

B. General structural condition of the second floor in light of proposed development of building:

The existing second floor joist framing system was so heavily overstressed that any reinforcement of the current system to support loads per the MSBC would essentially be a completely new system- the existing floor joists would provide an insignificant contribution to any "reinforced" framing scheme.

C. Recommendations for reinforcement or replacement of existing second floor structure in kind

i. The existing 1.875"x5.75" floor joists at 16" on center would be reinforced with 1.75"x14" laminated veneer lumber (LVL) floor joists at 16" on center (or 1.75"x11.25" LVL joists at 16" on center for residential reuse of the building). Refer to Section 1/SK1 showing the new and existing joist relationship (Attached to this report).

ii. Installation of the new floor joists would interrupt the existing ledger system that is "let in" to the exterior wall studs to support the original second floor joists. Interrupting the existing ledger would necessitate adding fasteners from the existing floor joists into the existing wall stud.

iii. I would not recommend reusing the existing wood flooring at the second floor level. It would be difficult to estimate the capacity of the floor diaphragm to resist lateral loads on the building if the existing wood flooring was reused as the structural sheathing element at the second floor (the sheathing on the floor joists, roof rafters, and wall studs is the material that creates the diaphragm system to resist lateral loads on wood structures and carry forces through the building to the foundations).

4. Main Floor Framing and Foundations

A. There were signs of moisture damage throughout the first floor level of the building that extended into the foundation materials. These signs included the following:

- There were holes in walls where the structure had completely deteriorated (Photos 3 and 4).
- The 8"x6" sills had deteriorated along much of the first floor perimeter (Photos 3 and 4). At some locations the wood had rotted to the point that a screwdriver could be easily inserted into the material that remained (Photo 4).

- It appeared that the heaviest amount of deterioration had occurred along the bases of the stud walls and at foundation conditions where the snow had been in contact with the structure throughout the winter months (Photos 4 and 5). This was especially true along the north wall of the building where maintaining the alley along that side of the building probably exacerbated the problem.
- Where stone foundation wall materials were accessible I was able to move some of the stone with my hand due to the deteriorated joint conditions. In addition, there were locations where large sections of the stone were missing. For instance, there appeared to be a section where 4" of stone had fallen away along the inside face of the foundation wall in the crawl space (Photo 6).
- There were floor joists that were badly deteriorated where they were bearing along the exterior stone foundation wall (Photo 7). No original wood materials would have been treated to resist the effects of exposure to moisture.

B. John Yust (Architect) and Tom Schroeder (Owner) reported that they removed a great deal of silt from the crawl space below the main floor framing. I assumed that the stone foundation walls were porous enough to allow the silt to be brought in from the exterior.

C. The main floor sheathing was buckled in some areas along the perimeter of the room where it appeared that the stone foundation materials below had moved upwards and caused distress to the sheathing. This type of distress was more significant along the north wall of the building (along the alley). I would suggest that water infiltration into the stone foundation wall had resulted in expansion of the wall during freezing temperatures. This theory is supported by the greater movement along the alley side of the building where snow would be added along the wall of the building during snow clearing efforts. This would contribute additional moisture along this wall of the building which would result in greater expansion during freeze events over time.

D. The main floor joists were bearing on a 3.5"x3.5" wood beam that was supported by 3.5"x3.5" wood columns in the crawl space. The bases of the wood columns showed signs of exposure to moisture and it was not apparent what the posts were bearing on (Photo 8).

E. General structural condition of main floor framing and foundations in light of proposed development of building:

i. Any floor joists with the type of deterioration observed at the bearing along the exterior stone foundation wall shown in Photo 7 would need to be removed and replaced.

ii. If any floor joists still have sound material where they bear along the exterior stone foundation wall, the foundation wall condition would need to be remodeled to support the joists in a manner that the joists would not be in contact with the stone material. The existing joists would not have been treated to resist contact with moisture at bearing conditions and this condition would need to be corrected. Remodeling the existing stone foundation wall would be difficult due to the relatively large width of the stone foundation wall along the perimeter of the building (17"-18" wide).

iii. The existing sill along the perimeter of the building would need to be removed and replaced due to the lack of preservative treatment in the existing members to resist the exposure to the moisture in the stone foundation walls. In addition, the deteriorated state of the existing sill would require removing most of this material anyways. Most of the sill conditions observed had deteriorated to the point that loads per the MSBC would not be properly transferred to the foundation system.

iv. The deteriorated joints and loose materials in the stone foundation walls make it extremely risky to reuse the walls with any redevelopment of the building. It would be difficult to simply grout

open joints in the walls due to the relatively massive width of the walls- it would not be possible to confirm that all open voids within the wall system were filled during the re-grouting efforts. Any open voids would continue to be susceptible to moisture infiltration in the future which could lead to expansion of the materials during freeze events. This is especially true along the existing alley where snow would continue to pile up during maintenance efforts and due to the fact that there is no moisture barrier along the exterior face of the foundation walls.

F. Recommendations for reinforcement or replacement of existing main floor structure and foundations in kind

i. The columns supporting the center beam should be removed and cannot be reused. To provide a more efficient structural system, two new 4x4 wood posts would be used to support (2) 1.75"x9.5" LVL beams (currently there are four or five interior columns along the center beam line). These columns would bear on concrete footings that would be 2'-6"x2'-6"x12" thick with 4-#4 reinforcing bars each way at the bottom of the footing.

ii. The main floor joists would be replaced with 2x10 floor joists spaced at 16" on center. The existing floor joists were deteriorated and cannot be reused as part of the main floor structural system.

iii. The stone foundation walls would be removed and replaced with the following:

- 24"x12" thick continuous concrete footing with 2-#5 continuous reinforcing bars
- Footing to bear at least 3'-6" below the adjacent finish grade
- Provide a 12" foundation wall made up of concrete masonry units (CMU). CMU would be reinforced with #5 reinforcing bars placed at 48" on center. The top course of the CMU would be a bond beam with 2-#4 continuous reinforcing bars. A limestone veneer could be included where the foundation wall is exposed above grade.

I would recommend against using a full stone foundation wall system as the material would be susceptible to water infiltration and the unreinforced stone would not be appropriate to resist lateral loads from the adjacent backfill material (Also refer to Section 4.E.iv of this report for further discussion of this topic).

iv. The existing sill plate at the base of the stud walls would need to be replaced with a continuous treated sill plate. The existing sill plate cannot be reused.

v. I would not recommend reusing the existing wood flooring at the main floor level. Similar to the recommendations for the second floor level, reusing the existing wood flooring would not provide a reliable diaphragm to resist lateral loads on the structure (Refer to Item 3.C.iii of this report).

5. One Story Shed on West Side of Building

A. The one story shed on the west side of the building was not constructed along with the original structure.

B. The wood rafters and wall studs showed signs of moisture infiltration throughout the addition.

C. It was unclear if there was a foundation system along the exterior stud wall of the shed that extended to frost depth or to the bedrock below. The concrete below the stud wall was cracked and appeared to have undergone excessively differential movement along the length of the wall (Photo 9)

D. General structural condition of shed in light of proposed development of building:

i. The existing framing materials at the one story shed have been exposed to so much moisture over the years I would recommend against reuse of the materials for any development of the building.

ii. There were no signs of a true foundation system supporting the stud walls of the one story shed. A new foundation system would be required for any structure in this location.

6. Exterior Wall Studs

A. The existing wall studs showed signs of moisture infiltration at many locations throughout the building.

B. The existing studs had deteriorated due to moisture infiltration along the base of the walls (Photos 3 and 4).

C. Recommendations for reinforcement or replacement of existing wall studs in kind

i. Existing studs that had been damaged by moisture cannot be reused.

ii. The existing studs that had been sistered to the original studs along the east gable end of the building during the past remodeling of the original structure should be removed and replaced (Photo 10). This existing condition is not structurally acceptable.

7. Quantitative Analysis of Reuse of Existing Materials for Repair of the Building

A. Roof framing- 0% of the existing structural materials from the roof level can be reused for the proposed development of the building. The existing materials were damaged by fire and cannot be reused.

B. Stair framing- 0% of the existing structural materials at the stairs can be reused. The existing framing system does not provide a continuous load path to the foundations.

C. Second floor framing

i. 0% of the existing flooring can be reused for development of the building. The existing boards do not create a proper structural diaphragm to transfer lateral loads (wind loads) through the building to the foundations.

ii. All of the existing floor joists could potentially remain in place. However, the new floor framing materials required to reinforce the existing system to resist loads per the MSBC would carry a significant majority of the loads. The bending moment capacity of the new LVL joists is 10 times greater than the bending moment capacity of the existing joists. In other words, the existing floor joists would no longer function as such because they would have an insignificant contribution to the actual structural performance of the building.

D. Main floor framing and foundations

i. 0% of the existing foundations can be reused for the development of the building. The materials have deteriorated and the ungrouted condition will continue to allow water infiltration. Allowing water infiltration will leave the building vulnerable to future damage due to trapped moisture creating overstress conditions during freeze-thaw cycles.

ii. 0% of the main floor joists can be reused. The joists have been damaged due to moisture infiltration to the point that they would not perform structurally and they should not be in contact with the new framing materials.

iii. 0% of the existing wood flooring can be reused. Like the recommendations for the second floor level, the reuse of the existing flooring would not create a proper structural diaphragm to act as part of the lateral load resisting system.

E. Wall studs

i. I would estimate that 70% of the wall studs can be reused. The other 30% of the studs have been damaged by moisture and cannot be reused.

ii. 0% of the existing wood boards on the outside face of the studs can be reused. As with the existing wood boards on the floor framing, the existing boards will not provide a diaphragm to resist lateral loads on the building.

8. **Practical Concerns Regarding Construction of "In Kind" Structure**
   A. Based on my observations, the only structural materials that would be reused for the proposed development of the building would be the second level floor joists and any wall studs that have not been damaged by moisture. However, the existing second floor joists would not be a functioning part of the structural system (Refer to Item 7.C.ii of this report). To accomplish the preservation of the second floor joists and the sound wall studs, a temporary shoring system would need to be installed to suspend the building while the new footings, foundation walls, and framing are constructed. The supports for the shoring system would need to be located far enough outside the building footprint to allow excavation and construction of the new footings and foundation walls as they are built up to the underside of the existing studs that will be suspended in space.
   B. I estimate that 20% of the existing structural materials would be reused for the restoration of the building.

Additional Comments

1. The opinions and conclusions expressed in this report are based on the reviewed information, site observations, and observations of the artifacts as well as my training, education, and experience. These opinions and conclusions are held to a reasonable degree of certainty. As additional information becomes available, I reserve the right to update or supplement the report.
2. It shall be noted that our firm has not been engaged to provide structural design and/or detailing of shoring required to temporarily support any framing or foundation materials that have been overstressed and will need to be repaired or replaced.
3. This report shall not be considered a construction document for performing any remedial work on the structural systems mentioned herein. All remedial structural work shall be completed in accordance with the provisions of the Minnesota State Building Code.

Please contact our office with any questions or comments regarding the structural conditions for the project.

Respectfully Submitted,

Richard W. Johnson, PE, Senior Project Engineer
Minnesota Registration #23406

Photo 1- Fire damage at roof level

Photo 2- Gap between rafters and wall sheathing on west end of roof

Photo 3- Openings in exterior stud wall

Photo 4- Rotted wood and deteriorated stone materials at base of stud wall

Photo 5- Rotted wood and missing/deteriorated stone materials at base of stud wall

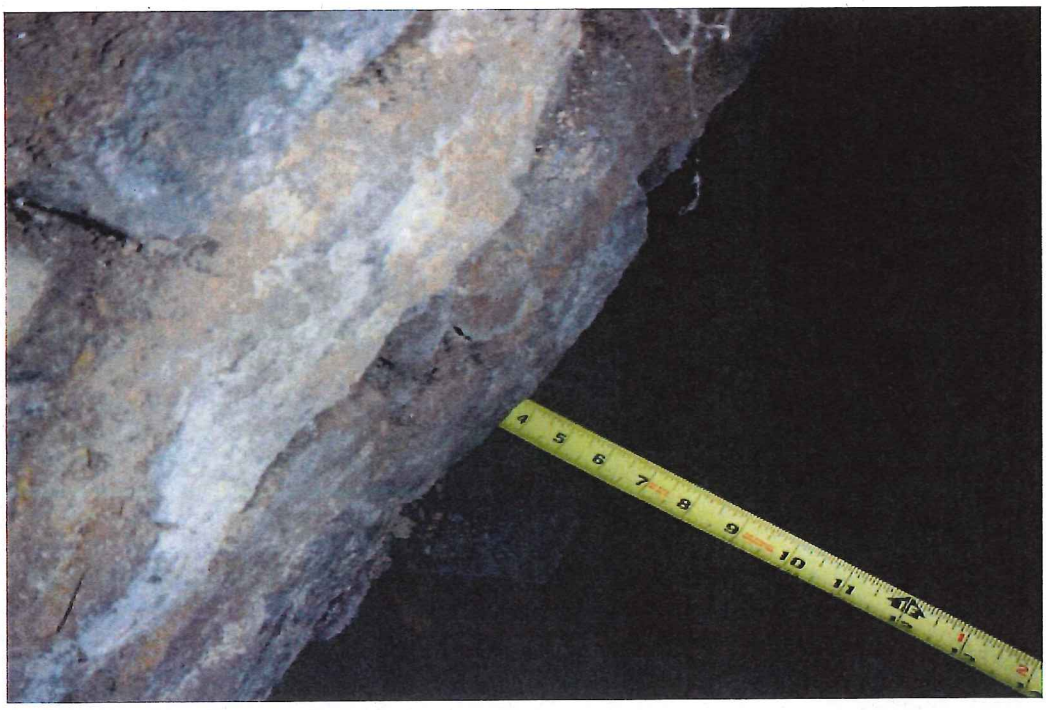


Photo 6- Looking downwards at a section of stone that had deteriorated along the foundation wall

Photo 7- Deteriorated joists and sill at bearing on stone foundation wall

Photo 8- Signs of moisture on columns in crawl space

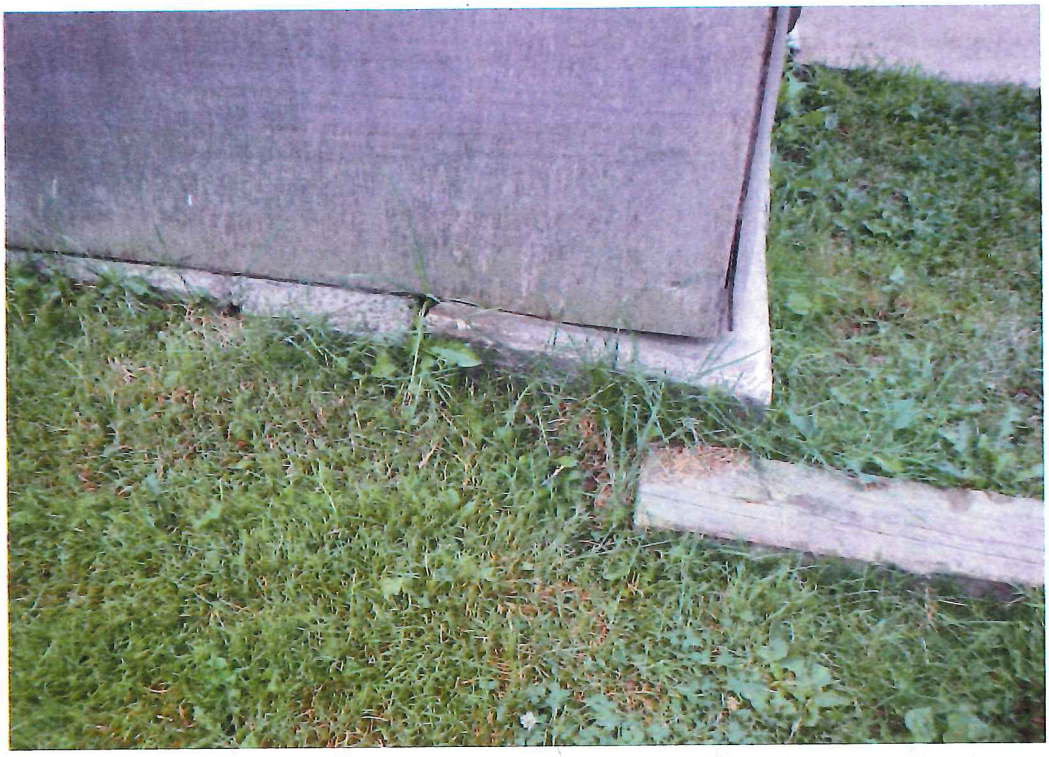


Photo 9- Signs of movement in concrete supporting stud walls of one story shed on west side of building

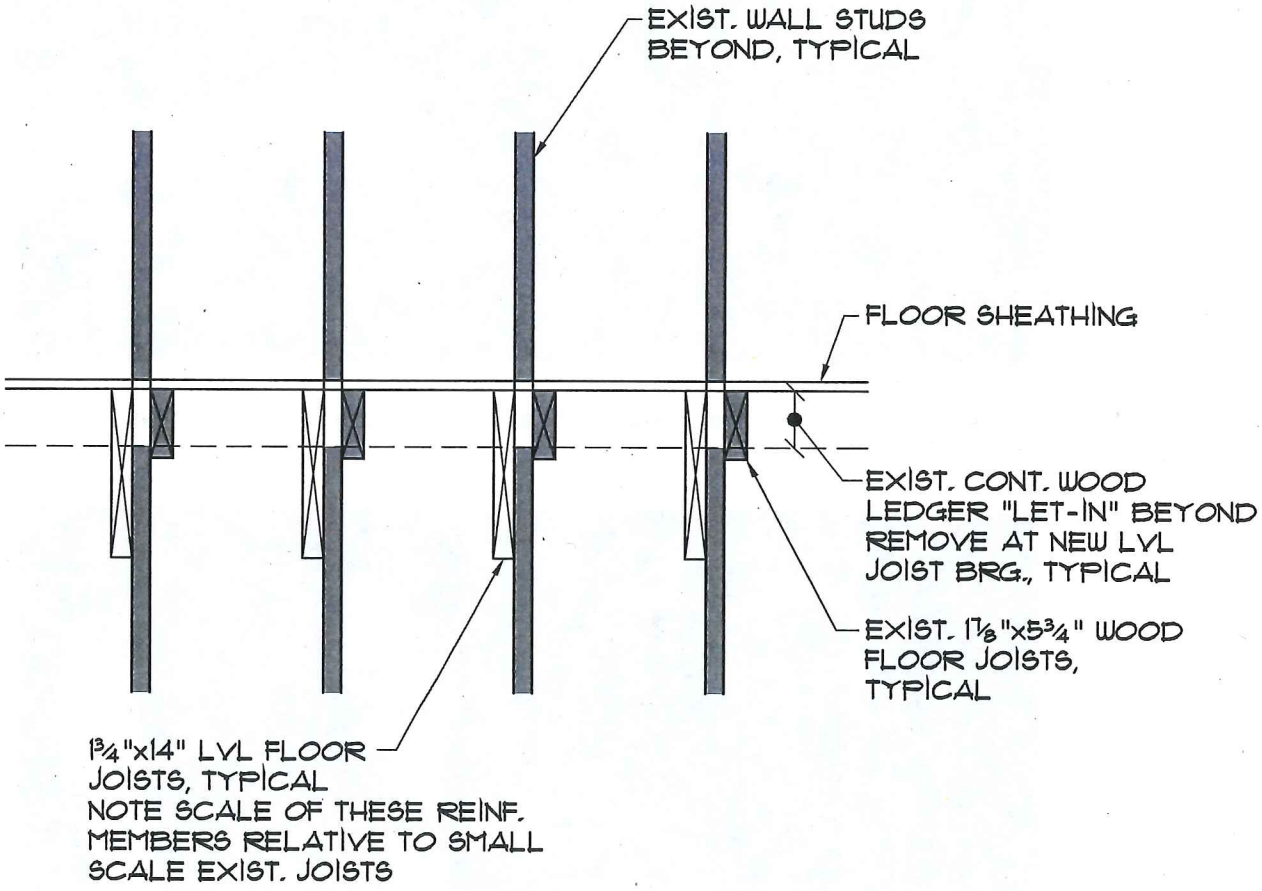
Photo 10- Sistered wall studs along east gable end at previous remodeling efforts

ALIGN Structural, Inc.

241 Cleveland Avenue South, Suite B7 Saint Paul, Minnesota 55105

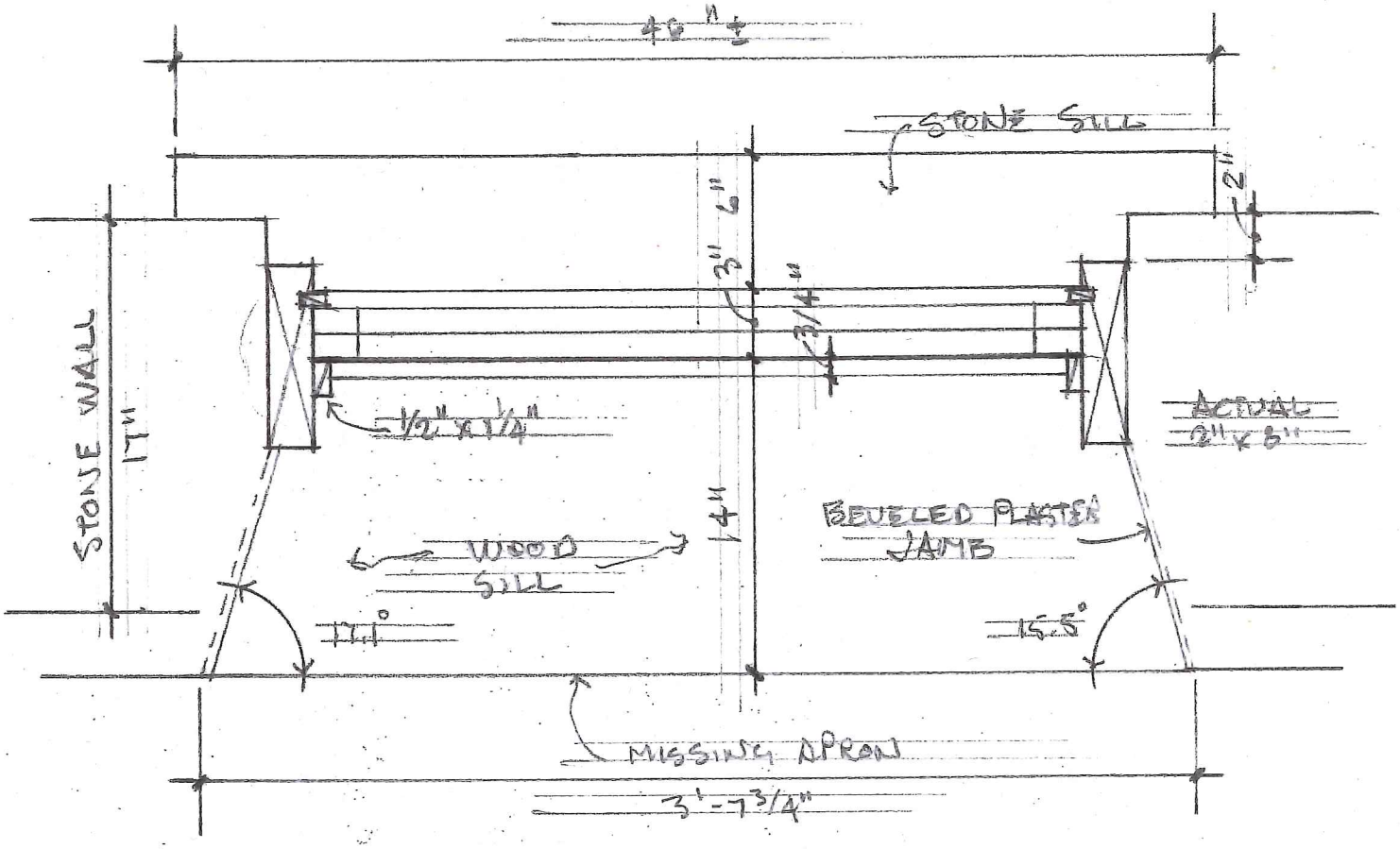
PROJECT 445 SMITH AVENUE JOB NO. 14246 DATE 8-19-14

SUBJECT STRUCTURAL INVESTIGATION BY RWJ SHEET NO. SK1 OF 1



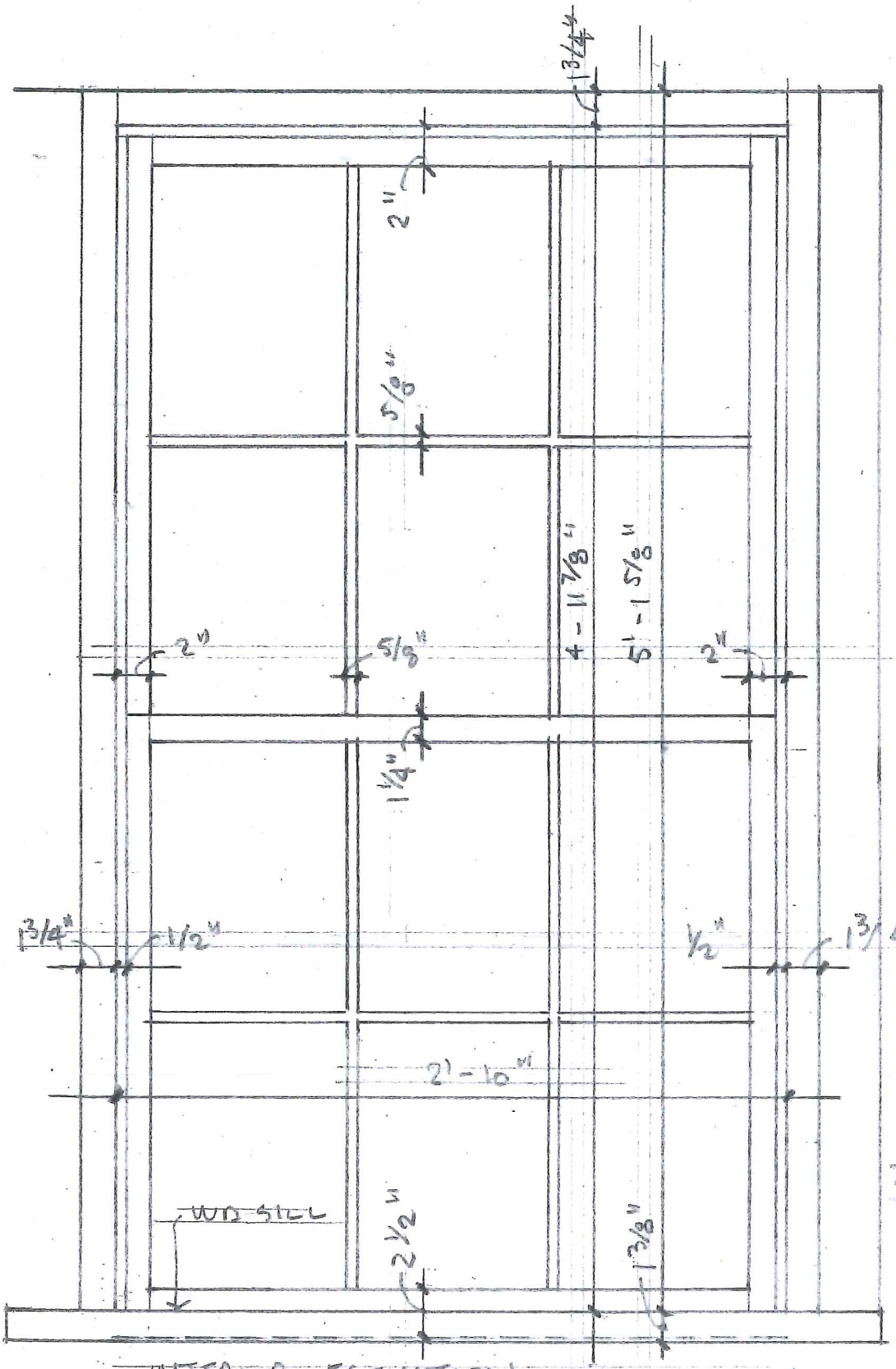
1/SK1 SECTION AT SECOND FLOOR JOIST REINFORCEMENT

SCALE ¾"=1'-0"



1
A-4

WINDOW SILL PLAN
SECOND FLOOR WINDOW - 445 SMITH
1 1/2" = 1'-0"
5/30/2013
dkh



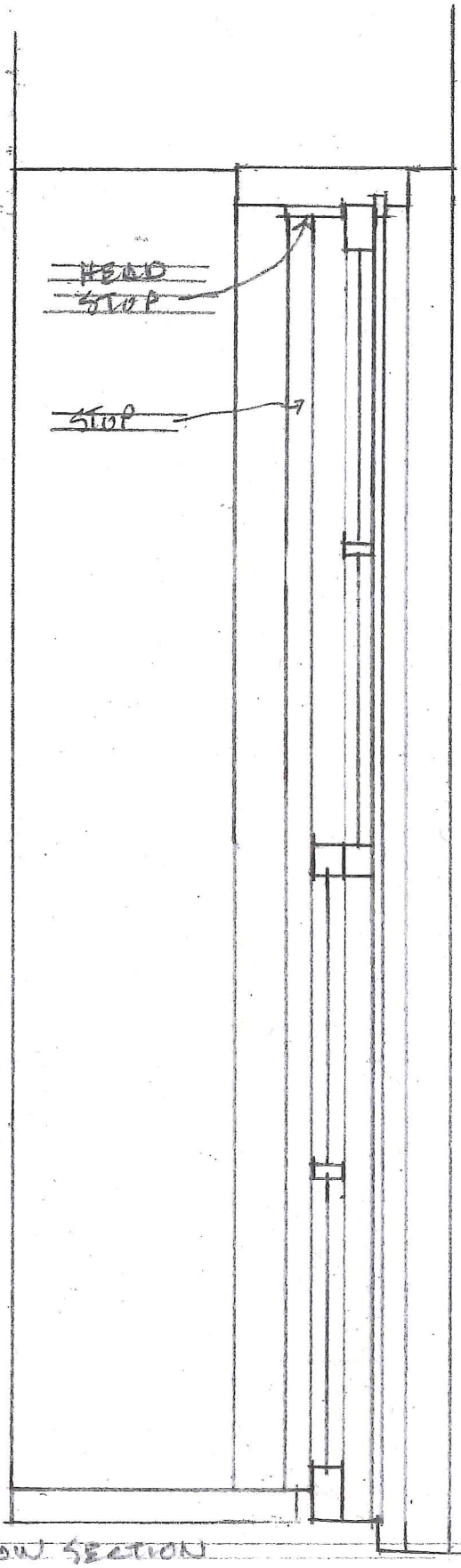
NOTE:
ALL LIGHTS EQUAL ≈ 9 1/2" x 13 3/4"

INTERIOR ELEVATION
SECOND FLOOR WINDOWS — AS SMITH

1
A-5

1 1/2" = 1'-0"

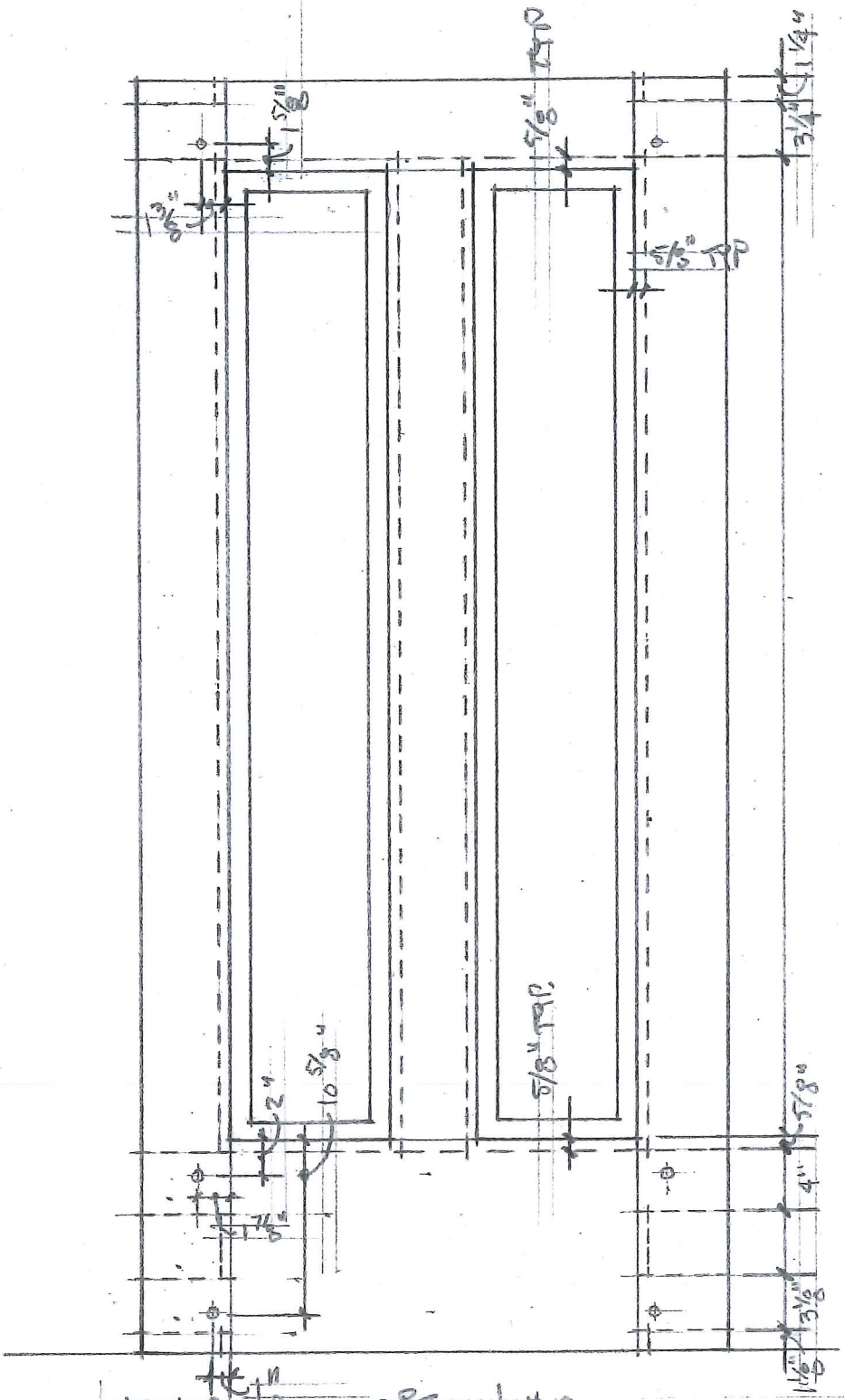
5/30/2013
JH4



1
A-6

WINDOW SECTION
SECOND FLOOR WINDOWS - AS SHOWN
1 1/2" = 1'-0"

5/30/2013
J. HAY



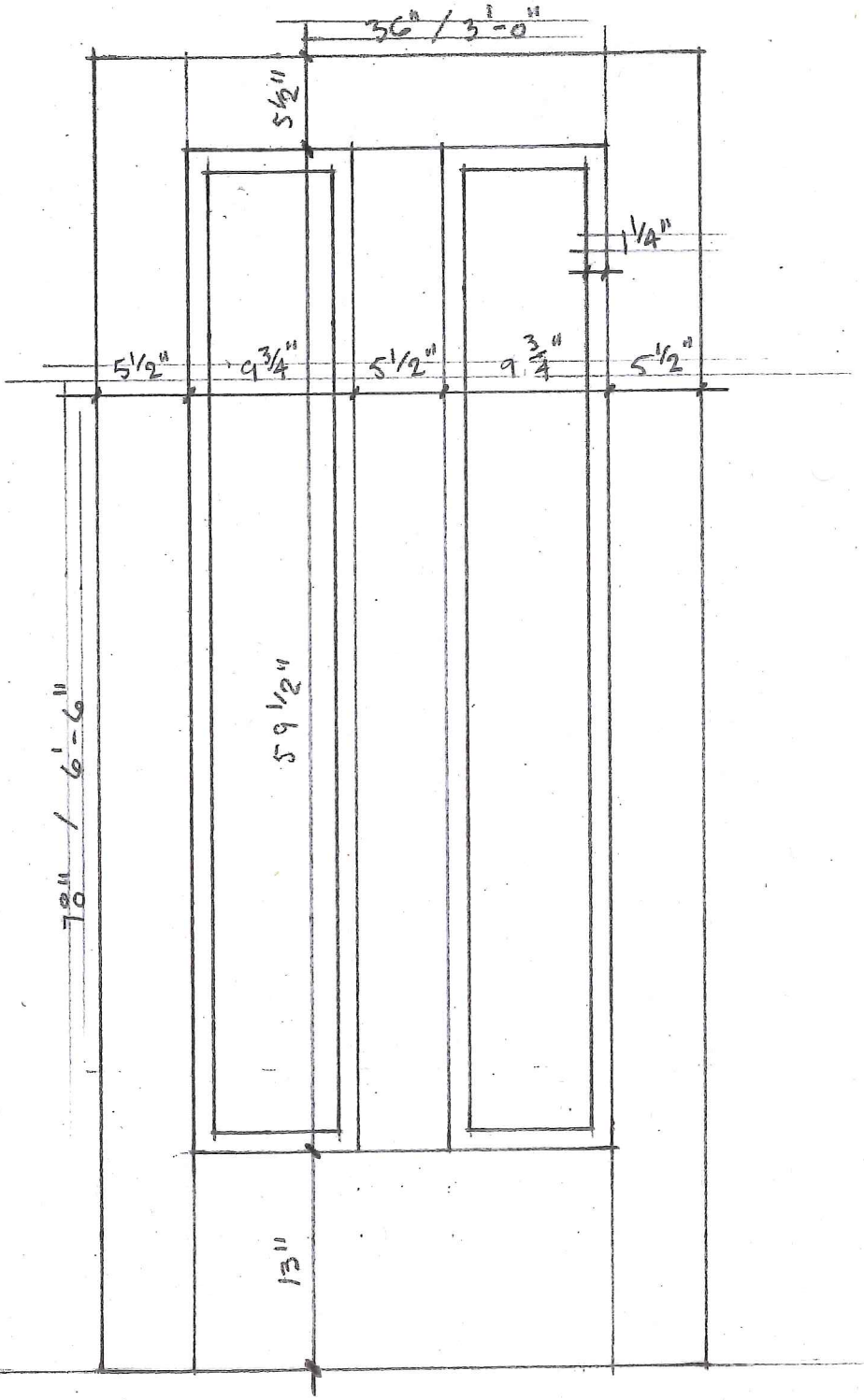
NEW DOOR - OPTION #2

1
A-10

3/32" = 1'

4/6/2012
JAY

REVISED 4/7/2012

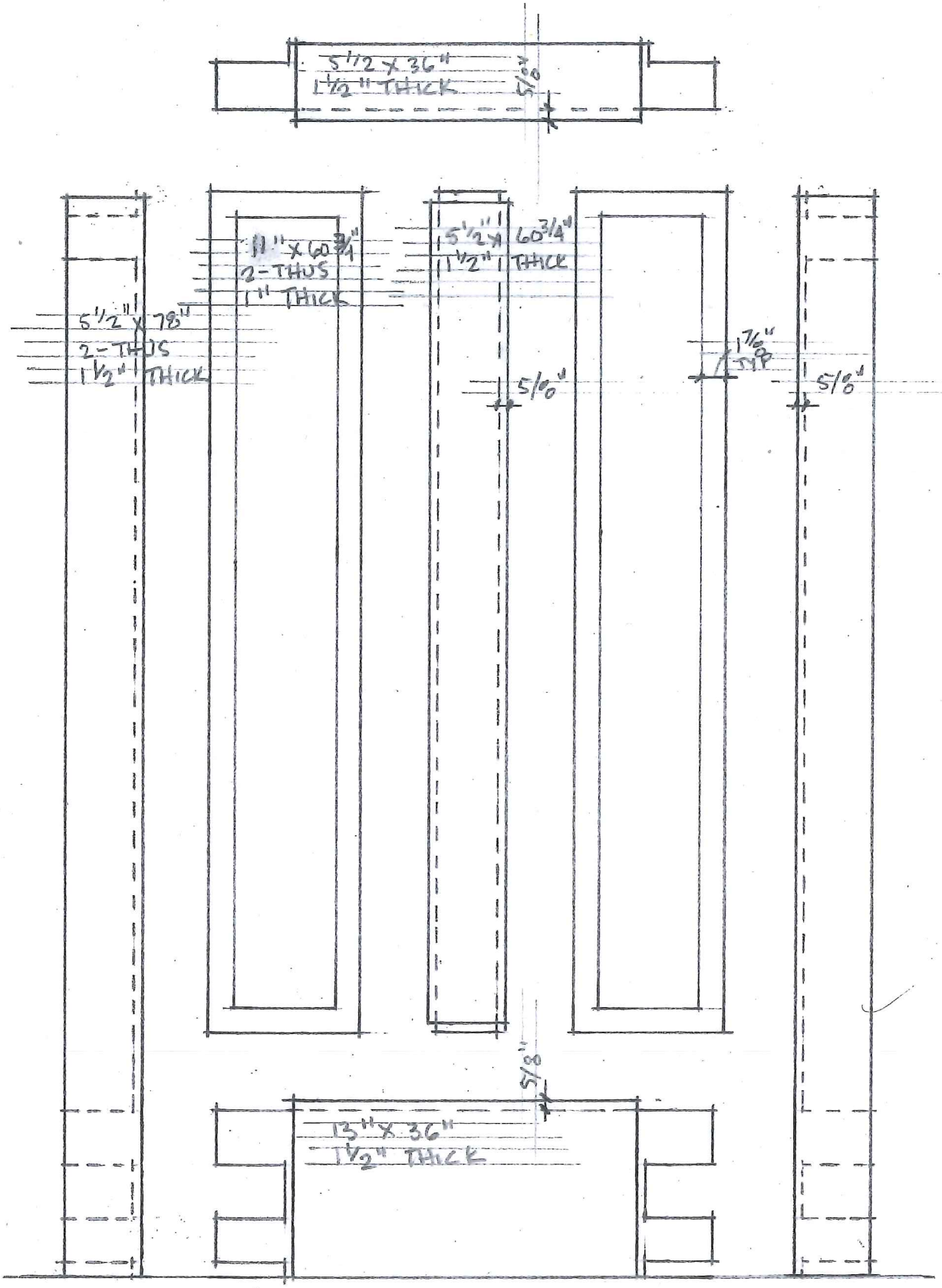


NEW DOOR - OPTION #2

1
A-16

3/32" = 1"

4/5/2012
JAY



NEW DOOR OPTION #2

1
A-19

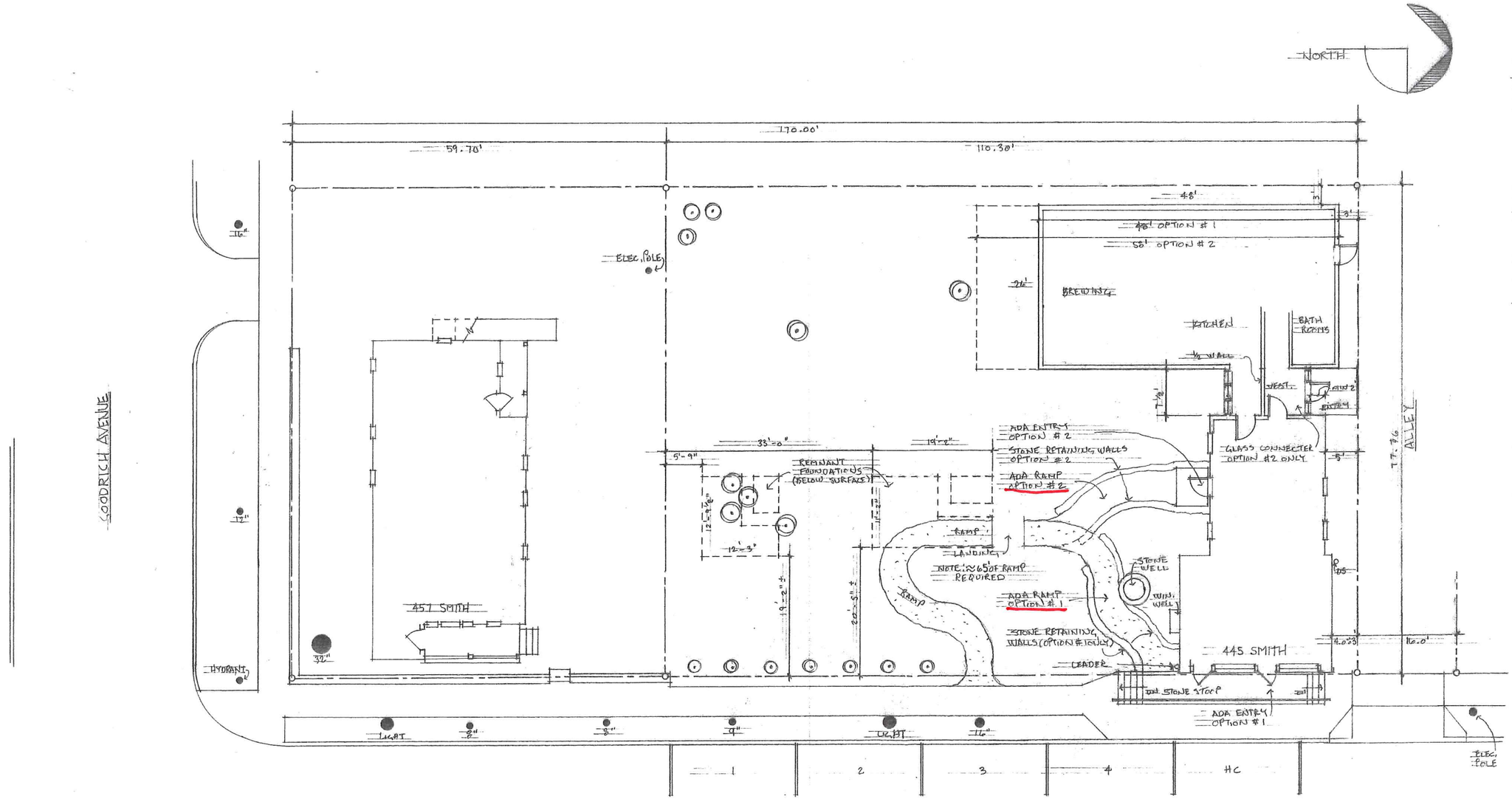
NOTE: RAISED PANEL ONE SIDE ONLY

3/32" = 1"

4/6/2012

JMY

REVISED 4/7/2012



1 / L-3 SITE PLAN
1/8" = 1'-0" 3/15/2015

Revision dated 9.25.15
- 2 options for accessible route

FUCHS - WALDMAN BUILDING, 445 SMITH AVE.
TOM AUD ANN SCHROEDER • 194 MCBOAL STREET • SAINT PAUL, MINNESOTA 55102
YUST ARCHITECTURAL SERVICES
476 West 7th Street ■ Saint Paul, MN 55102 ■ (651) 225-9601

DATE • REVISIONS
3/15/2015
7/20/2015
7/23/2015
9/15/2015
9/25/2015

COMM NO • DRAWN • CHECKED

SITE PLAN

DRAWING NO.

L 3

NORTH

170.00'

59.70'

110.30'

48'

ELEC. POLE

BREWING

OFFICE ET.

KITCHEN

BATH ROOMS

VESTIBULE

ENTRY

RAISED GRADE

ALLEY

33'-0"

5'-9"

LANDING

RAMP

LANDING

NOTE: 45' OF RAMP REQUIRED

STONE WELL

RAMP

19" STONE RETAINING WALL

WIND WELL

445 SMITH

4.0%

10.0'

DN. STONE STOOP

ADA ENTRY

457 SMITH

30'

HYDRANT

LIGHT

LIGHT

ELEC. POLE

1

2

3

4

#C

GOODRICH AVENUE

SMITH AVENUE

1 SITE PLAN
L-3 1/16" = 1'-0" 3/15/2015

Revision dated 9.15.15
* Not proposed

FITCH + WALDMAN BLDNG. 445 SMITH AVE

YUST ARCHITECTURAL SERVICES
476 West 7th Street ■ Saint Paul, MN 55102 ■ (651) 225-9601

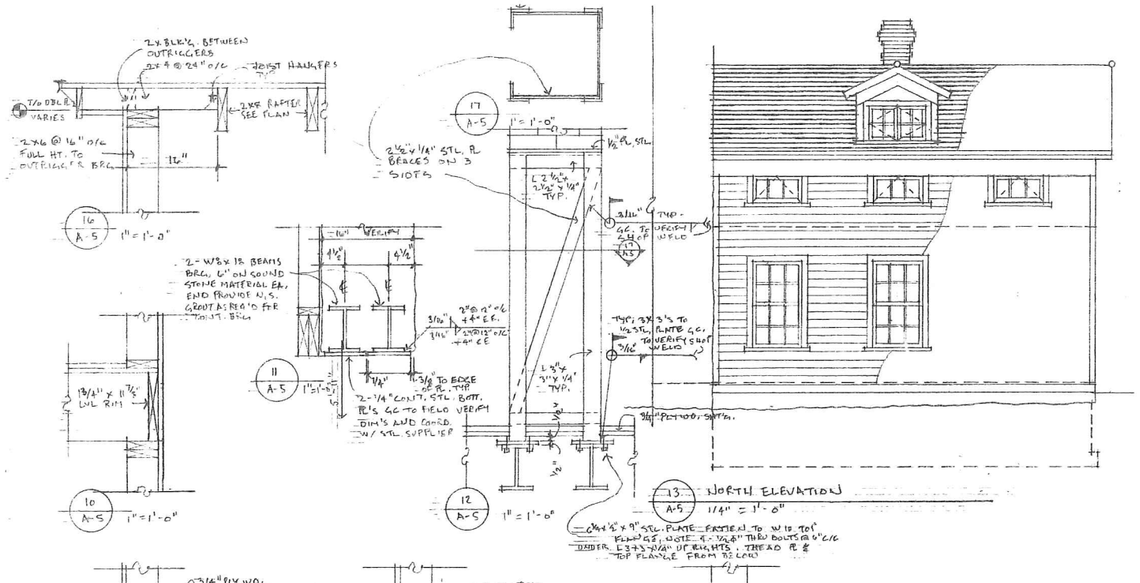
DATE • REVISIONS
3/15/2015
7/10/2015
7/23/2015
9/15/2015

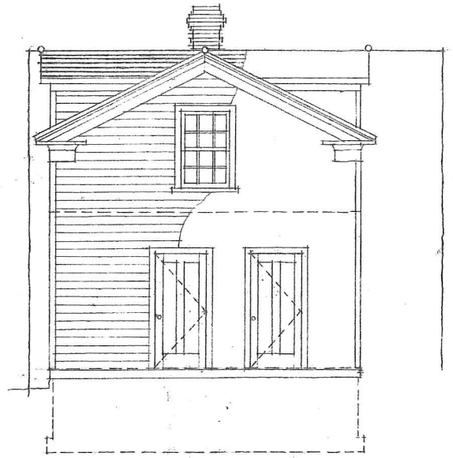
COMM NO • DRAWN • CHECKED

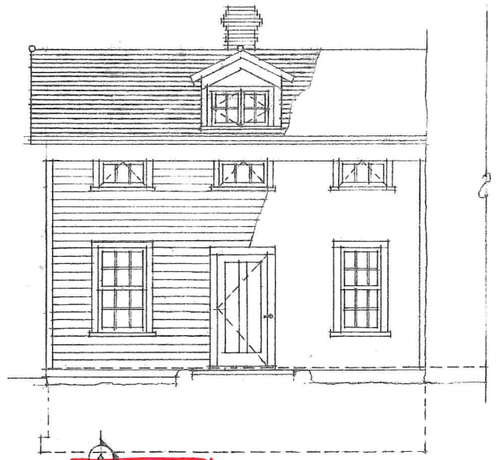
SITE PLAN

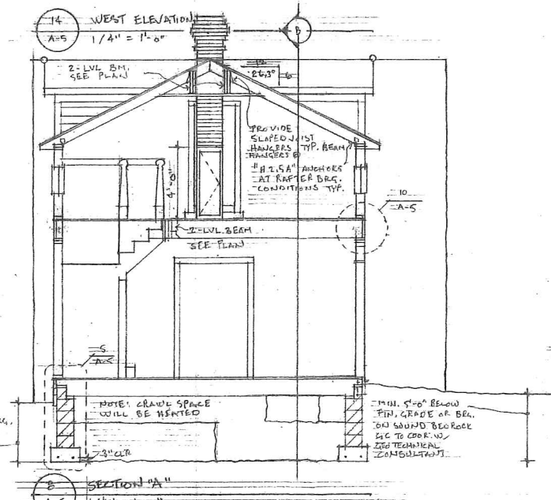
DRAWING NO.

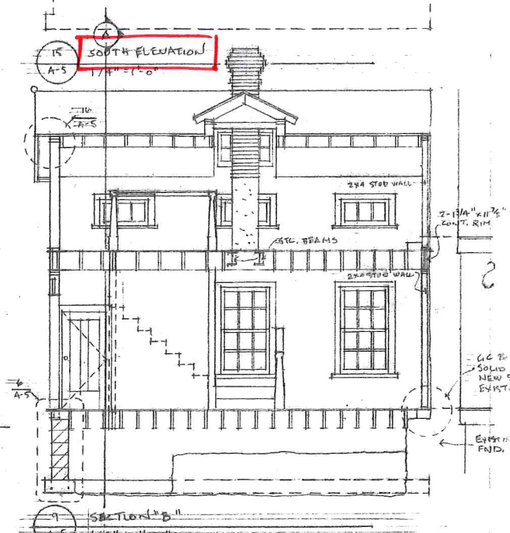
L3

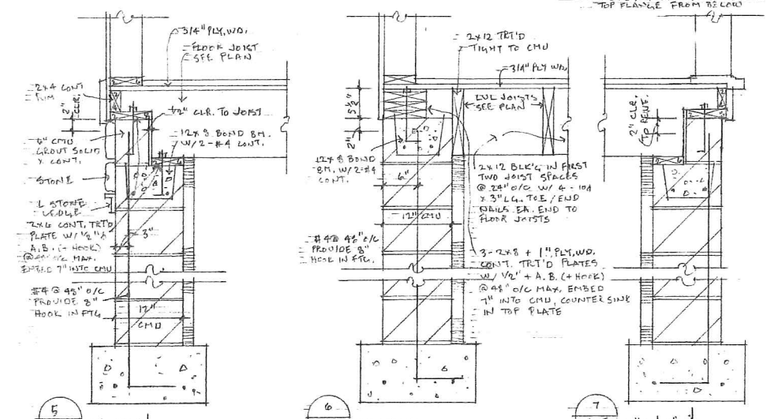


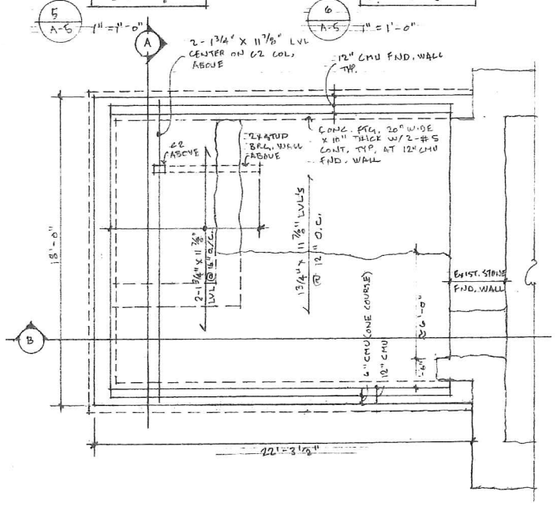


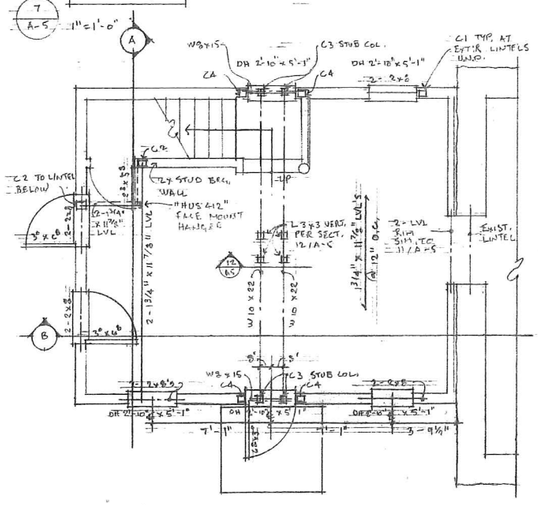


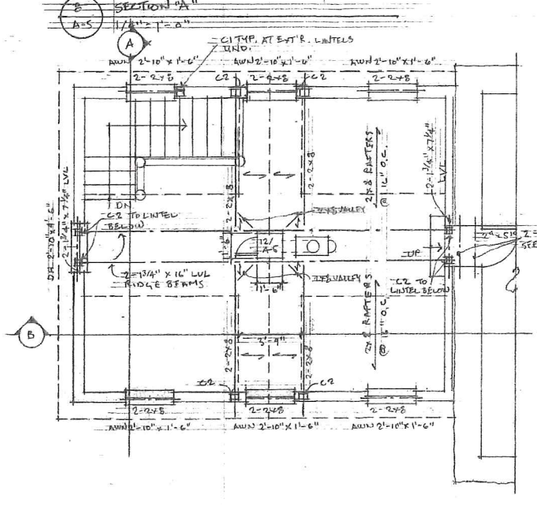


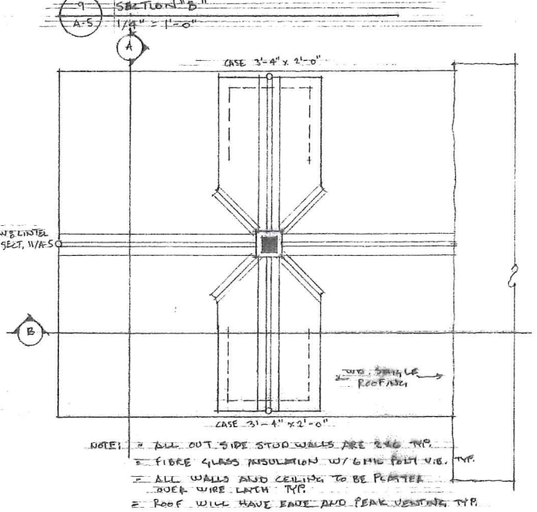












NOTE: 1. ALL OUT. SIDE STUD WALLS ARE 2x6 TYP.
2. FIBRE GLASS INSULATION W/ 6 MIL POLY V.B. TYP.
3. ALL WALLS AND CEILING TO BE PLASTER
4. DOOR WIRE LATCH TYP.
5. ROOF WILL HAVE EAVE AND PEAK VENTING TYP.

1 A-5 MAIN FLOOR FRAMING AND FOUNDATION PLAN 1/4" = 1'-0"

2 A-5 FIRST FLOOR (SECOND FLOOR FRAMING PLAN) 1/4" = 1'-0"

3 A-5 SECOND FLOOR (ROOF FRAMING PLAN) 1/4" = 1'-0"

4 A-5 ROOF PLAN 1/4" = 1'-0"

Revision 9.25.15

FRAME BUILDING - 445 SMITH AVENUE

YUST ARCHITECTURAL SERVICES
476 West 7th Street ■ Saint Paul, MN 55102 ■ (651) ~~225-9601~~ 222-3411
TOM SCHROEDER • 194 MEDICAL STREET • SAINT PAUL, MINNESOTA 55102
OFFICE - 612-735-2838
CELL # - 612-756-7220

DATE • REVISIONS
5/29/2014
6/11/2014
6/15/2015
9/15/2015
9/25/2015

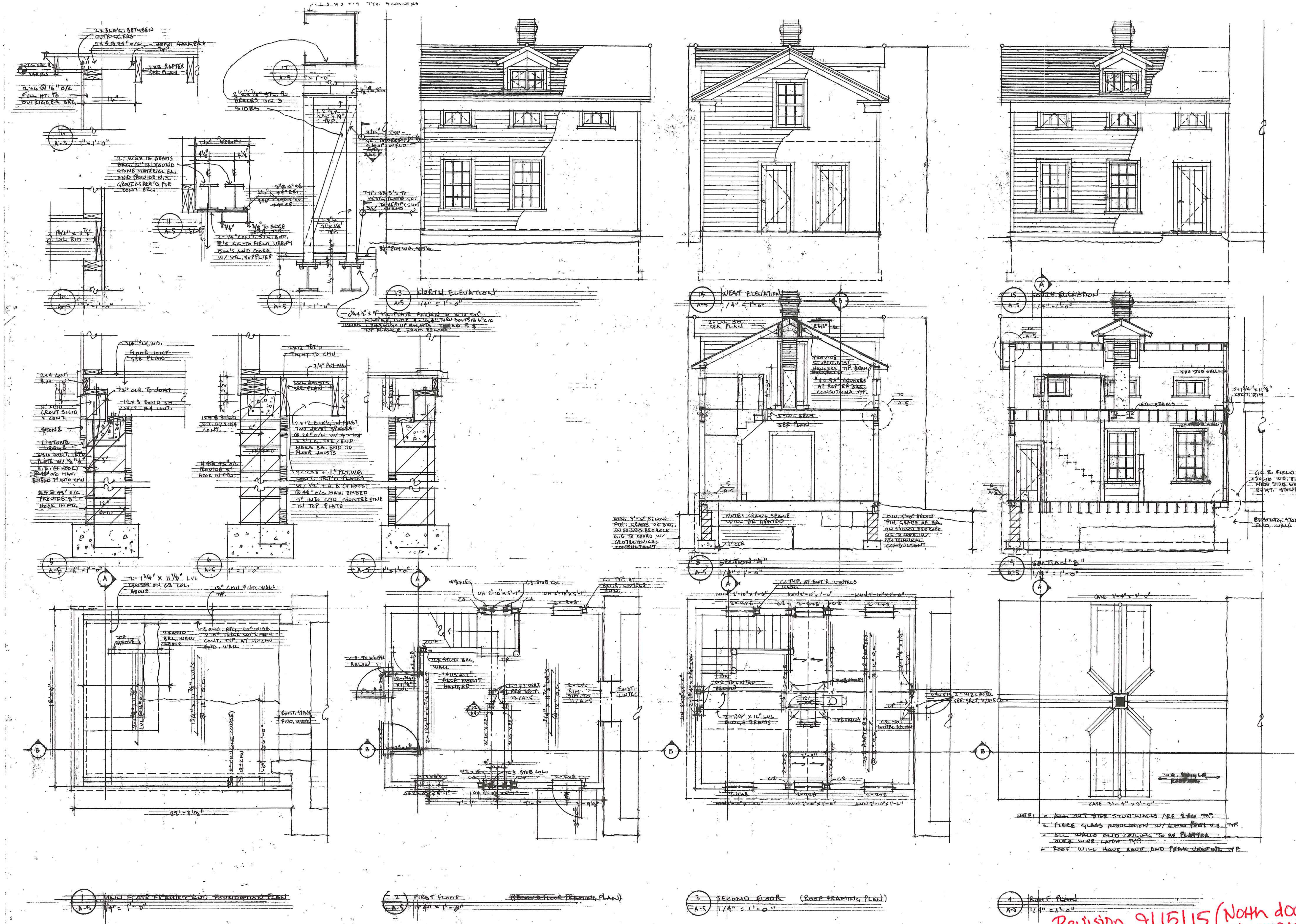
PLANS, SECTIONS, AND ELEVATIONS

COMM NO • DRAWN • CHECKED

1-2005 JWH

DRAWING NO.

A 5



FRAME BUILDING - 445 SMITH AVENUE

YUST ARCHITECTURAL SERVICES

476 West 7th Street ■ Saint Paul, MN 55102 ■ (651) 225-9601

PLANS, SECTIONS AND ELEVATIONS

COMM NO • DRAWN • CHECKED

DATE • REVISIONS

DRAWING NO.

A5

Revision 9/15/15 (North door not moved)

1 / A-2 EAST ELEVATION
1/8" = 1'-0"

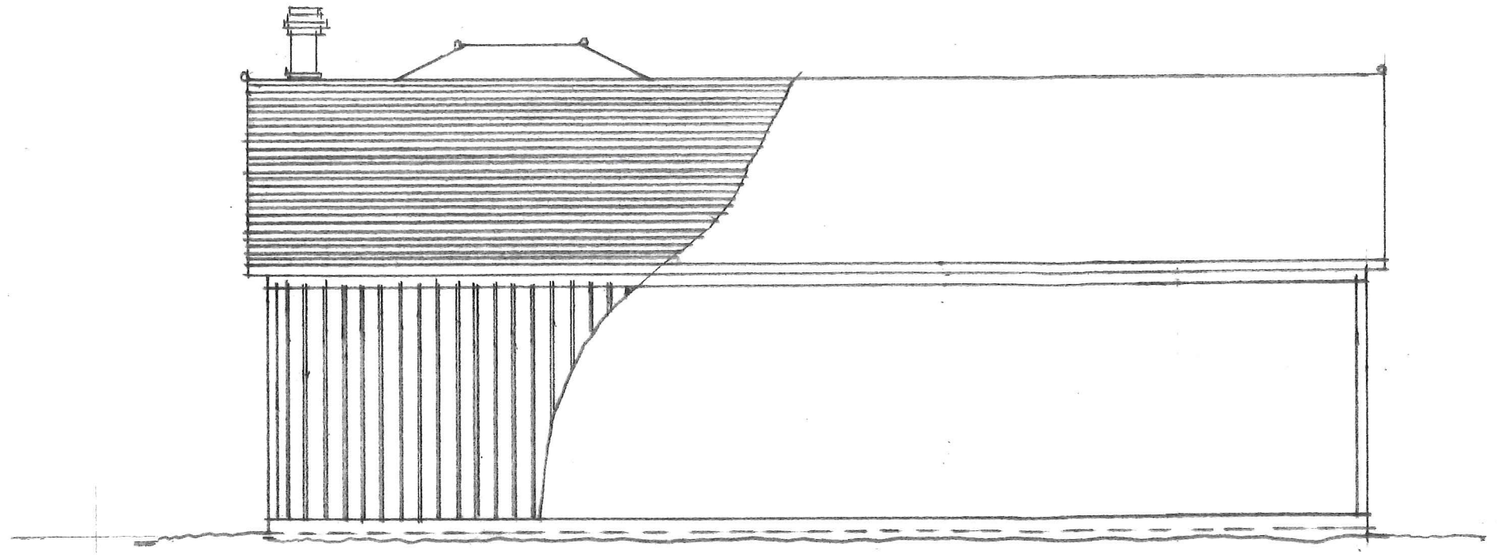
7/23/2015

2 / A-3 NORTH ELEVATION
1/8" = 1'-0"

~~7/23/2015~~

Revision 9.25.15??
Option "2"

12:8 pitch & glass vestibule



1 / A-4 WEST ELEVATION

1/8" = 1'-0"

7/23/2015

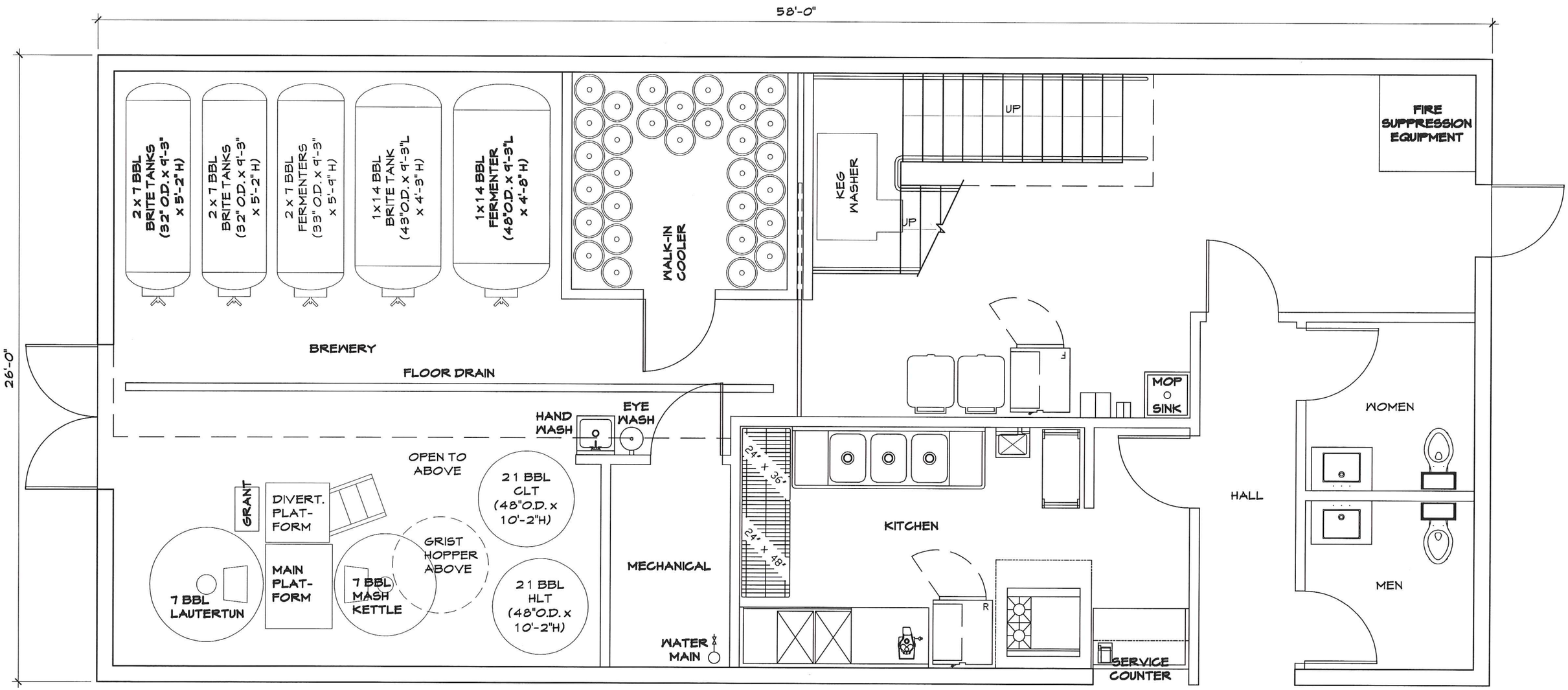
2 / A-4 SOUTH ELEVATION

1/8" = 1'-0"

~~7/23/2015~~ Revision 9.25.15

Option "2"

12:8 pitch & glass vestibule

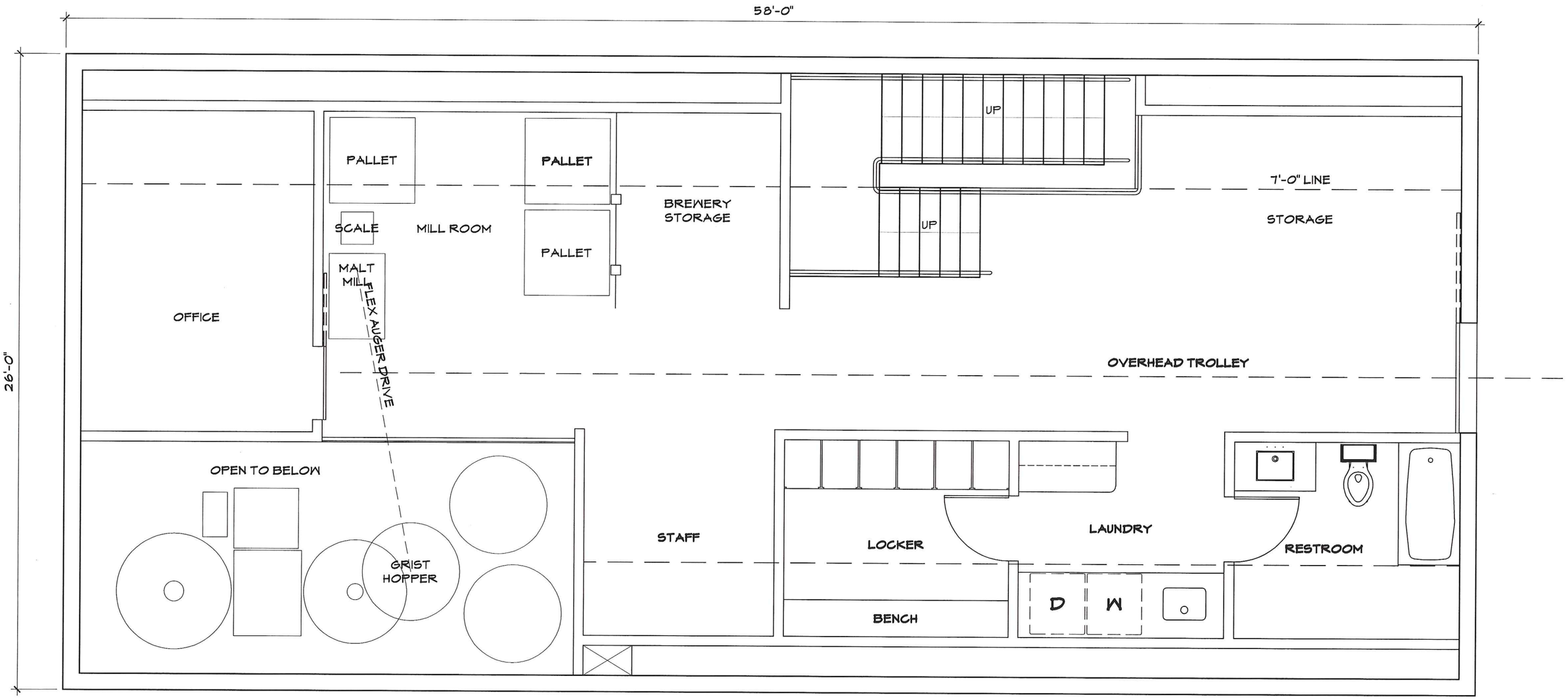


FIRST FLOOR PLAN

$\frac{1}{4}$" = 1'-0"

OPTION 2 - 8:12 ROOF

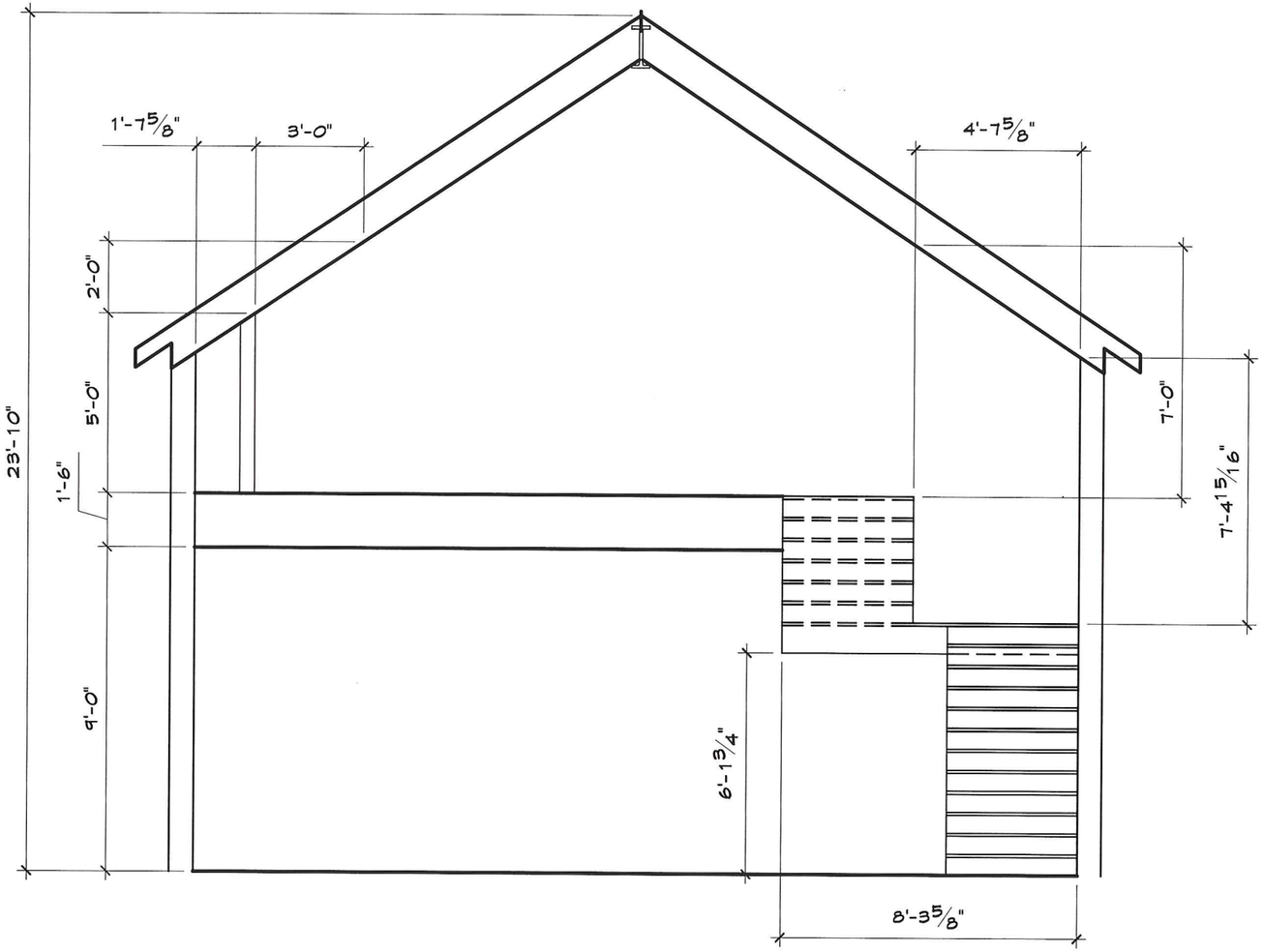
Revised 9.25.15 ?



SECOND FLOOR PLAN $\frac{1}{4}$" = 1'-0"

OPTION 2 - 8:12 ROOF

Revised 9.25.15

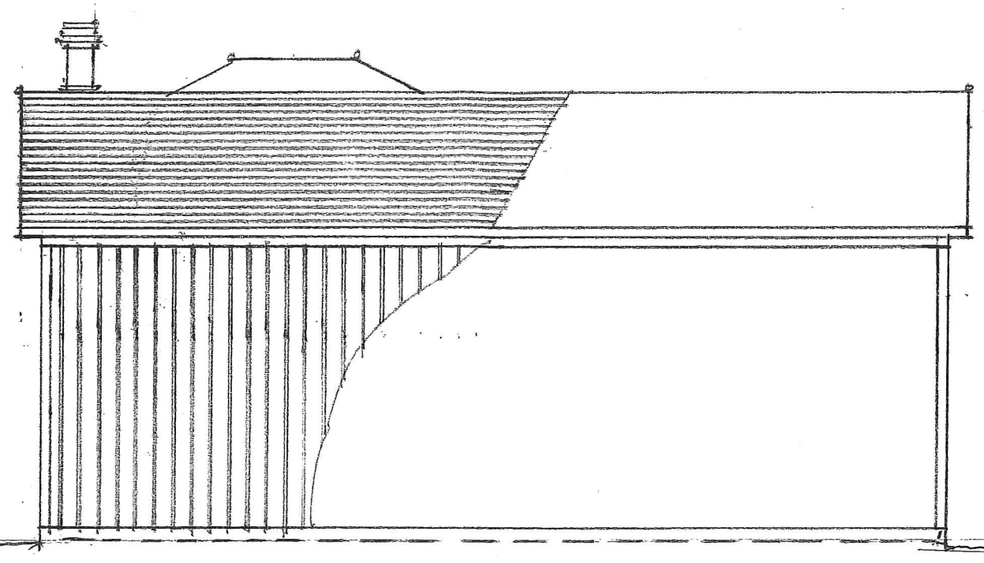


BUILDING SECTION

OPTION 2 - 8:12 ROOF

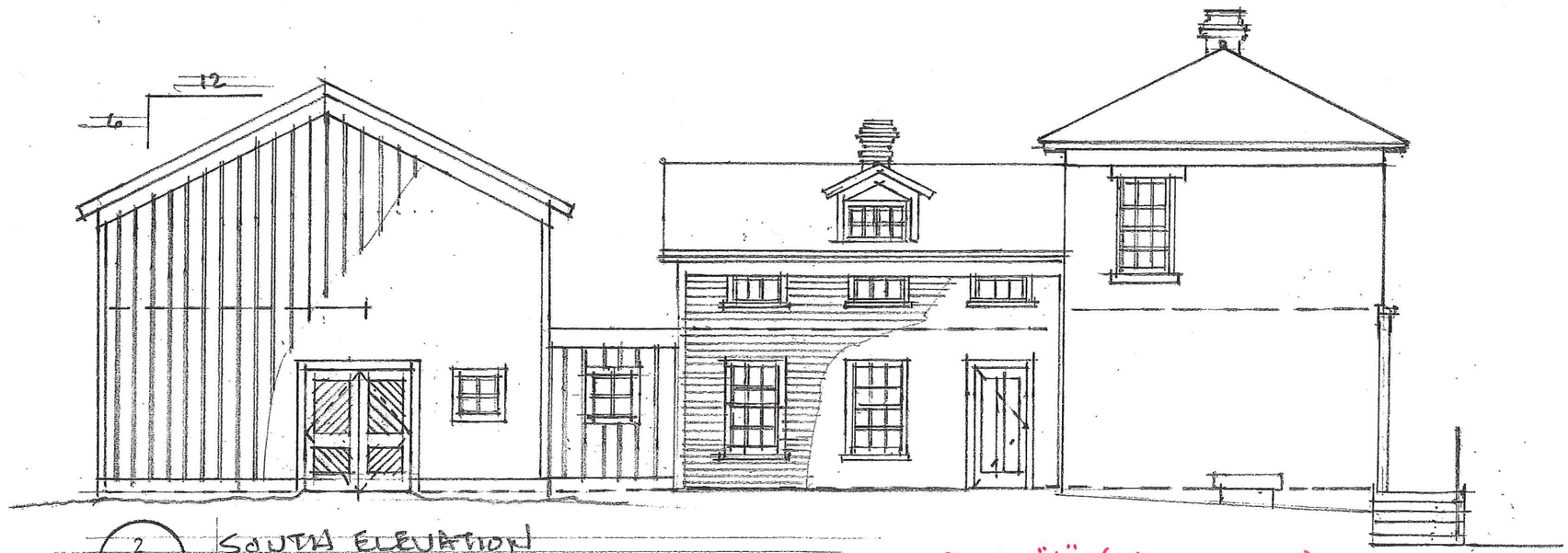
$\frac{1}{4}$" = 1'-0"

Revised 9.25.15



1 / A-2 WEST ELEVATION

1/8" = 1'-0" 7/23/2015

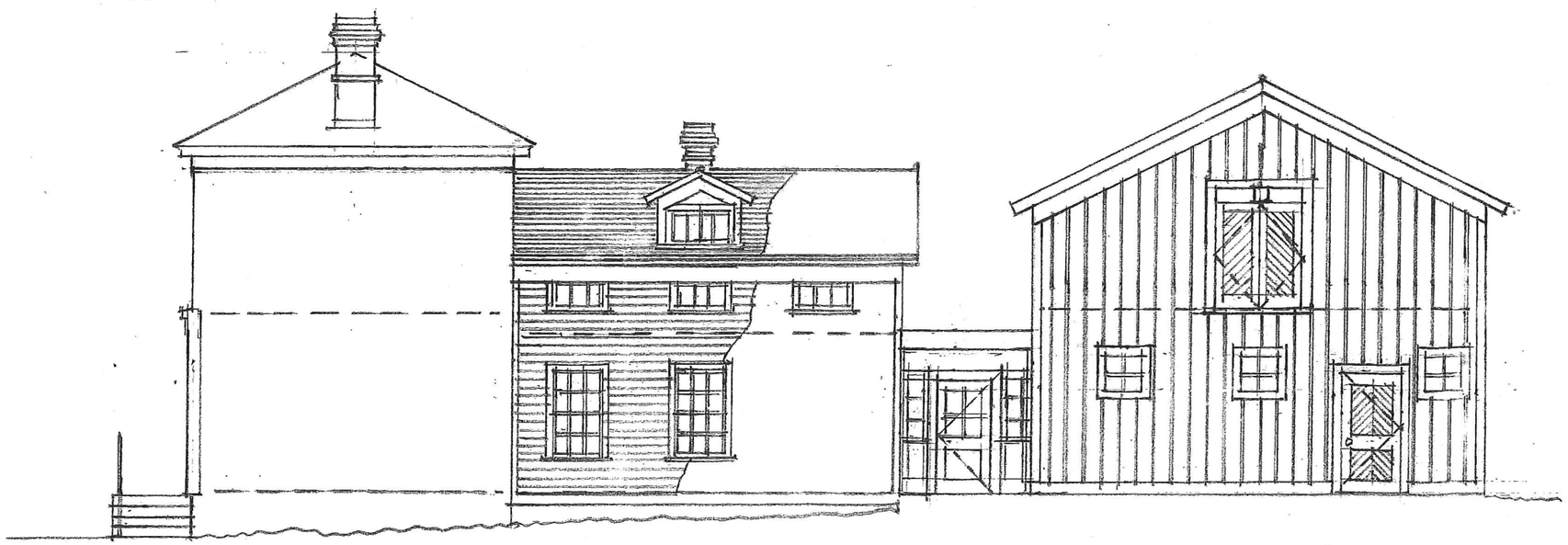


2 / A-2 SOUTH ELEVATION

1/8" = 1'-0" 7/23/2015

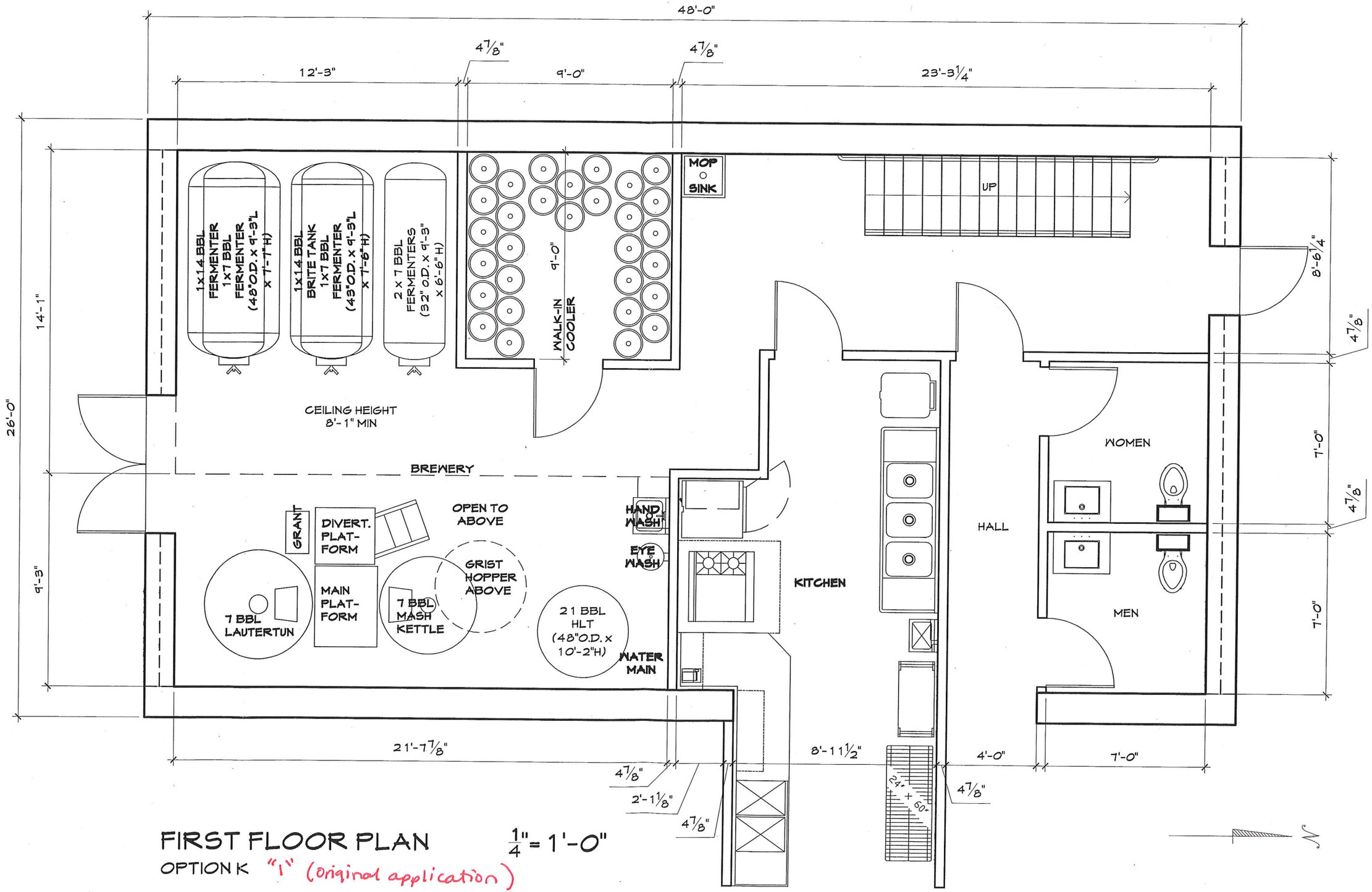
Option "1" (orig. application)

1 / A-1 EAST ELEVATION
1/8" = 1'-0" 7/23/2015



2 / A-1 NORTH ELEVATION
1/8" = 1'-0" 7/23/2015

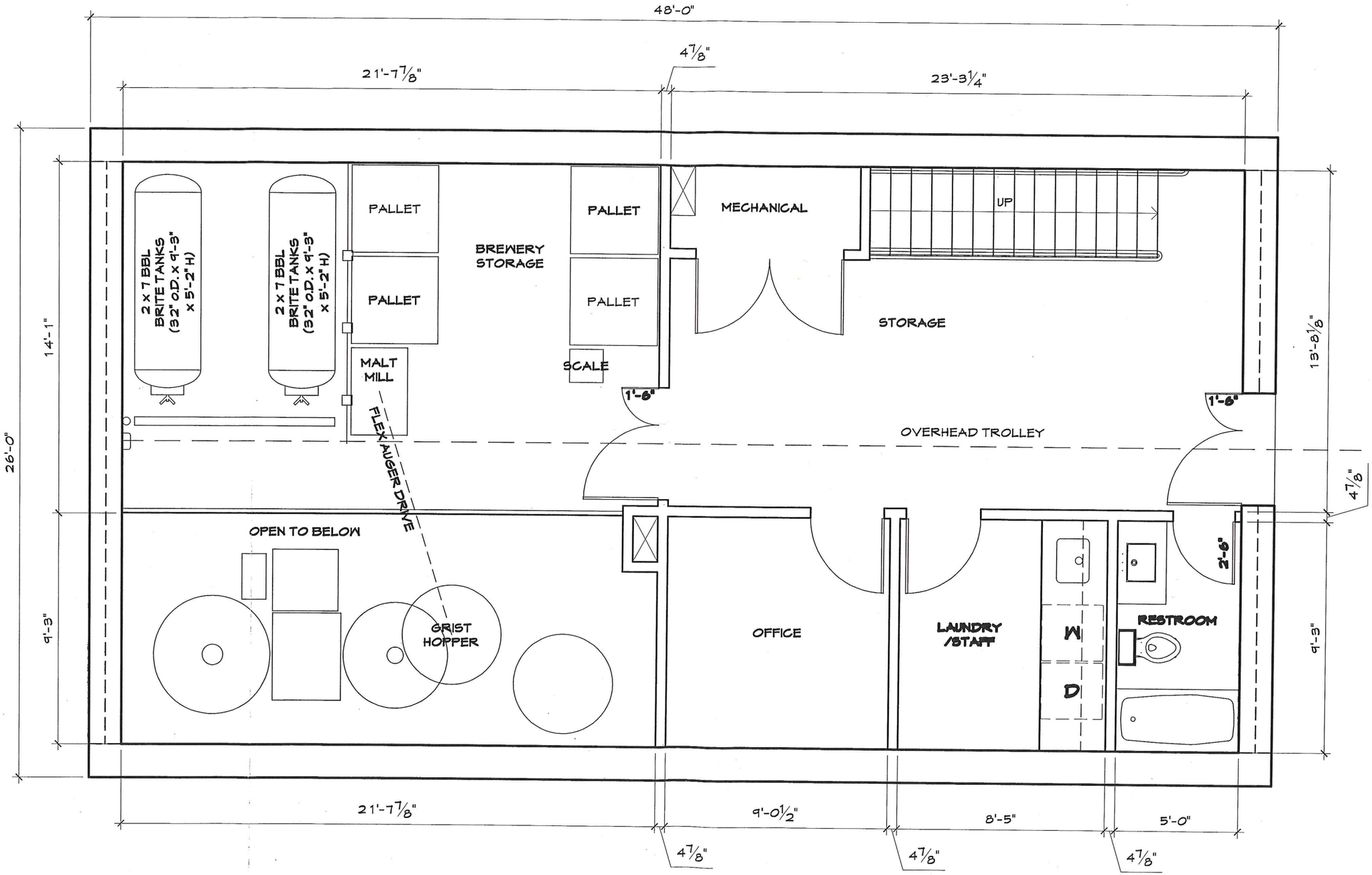
Option "1" (orig. application)



FIRST FLOOR PLAN

1/4" = 1'-0"

OPTION K "1" (original application)



SECOND FLOOR PLAN $\frac{1}{4}$" = 1'-0"

OPTION K "1" (Original application)

2 x BLK'G. BETWEEN OUTRIGGERS

2x4 @ 24" O/C

JOIST HANGERS TYP.

2x8 RAFTER SEE PLAN

2x6 @ 16" O/C FULL HT. TO OUTRIGGER BRG.

16"

VARIES

16
A-5
1" = 1'-0"

17
A-5
1" = 1'-0"

2 1/2" x 1/4" STL. PL. BRACES ON 3 SIDES

1/2" PL. STL.

L 2 1/2" x 2 1/2" x 1/4" TYP.

3/16" TYP.

G.C. TO VERIFY

SHOP WELD

17
A-5

TYP. 3x3's TO 1/2 STL. PLATE G.C. TO VERIFY

SHOP WELD

3/16"

L 3" x 3" x 1/4" TYP.

3/4" PLYWD. SHTG.

1/2"

16"

4 1/2"

4 1/2"

2 - W8x18 BEAMS BRG. 6" ON SOUND STONE MATERIAL EA. END PROVIDE N.S. GROUT AS REQ'D FOR CONT. BRG.

3" @ 12" O/C

3/16" + 4" E.E.

3/16" 3" @ 12" O/C + 4" E.E.

1/4"

3/8" TO EDGE OF PL. TYP.

2 - 1/4" CONT. STL. BOTT. PL'S G.C. TO FIELD VERIFY DIM'S AND COORD. W/ STL. SUPPLIER

11
A-5
1" = 1'-0"

RAFTER SEE PLAN

3/4" x 11 7/8" LVL RIM

JOIST HANGER TYP.

2x8 CONT. LEDGER W/ (3) NO. 9 WD. SCREWS @ 12" O/C EMBED 3/4" INTO LVL RIM

10
A-5
1" = 1'-0"

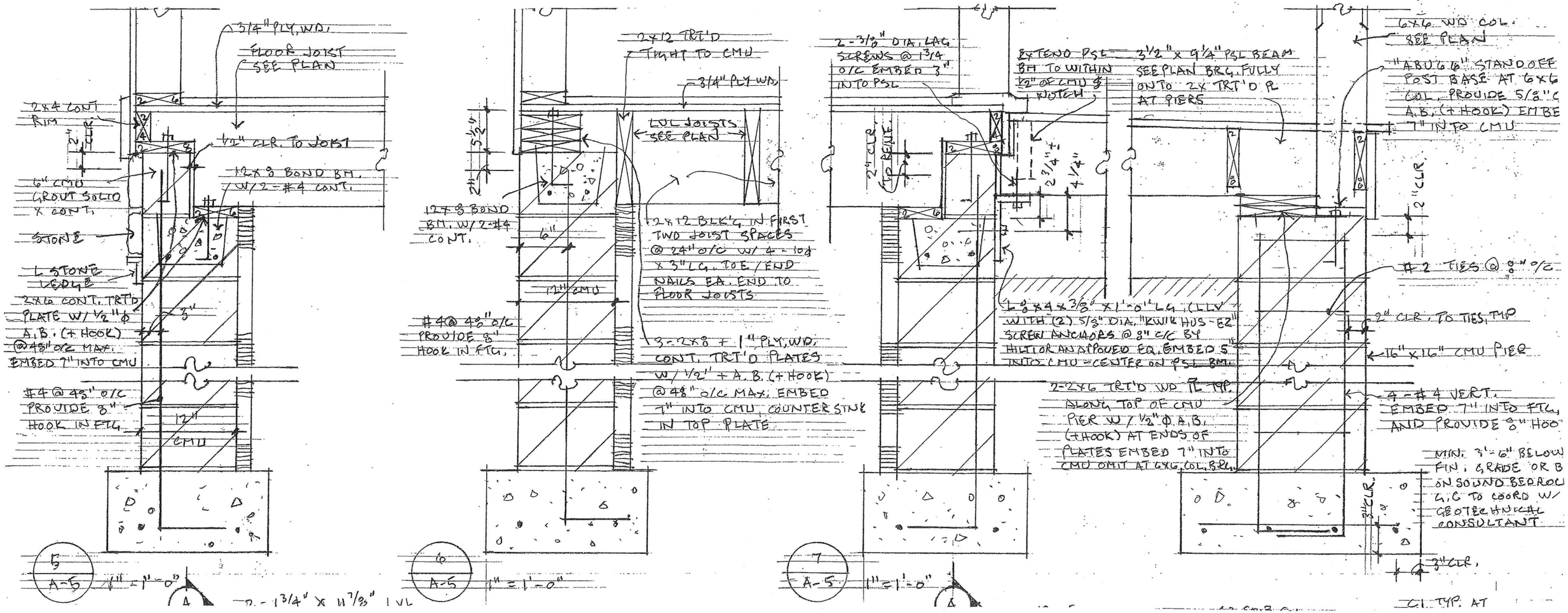
12
A-5
1" = 1'-0"

13 NORTH ELEVATION
A-5
1/4" = 1'-0"

3/4" x 1/2" x 9" STL. PLATE FASTEN TO W 10 TOP FLANGE NOTE 4 - 1/2ø THRU BOLTS @ 6" C/C UNDER L 3"x3"x1/4" UP RIGHTS. THREAD PL & TOP FLANGE FROM BELOW

Orig. application

bldg. application



14 A-5 WEST ELEVATION
1/4" = 1'-0"

15 A-5 SOUTH ELEVATION
1/4" = 1'-0"

2-LVL BM. SEE PLAN

PROVIDE SLOPED JOIST HANGERS | TYP. BEAM HANGERS @

"H2.5A" ANCHORS AT RAFTER BRG. CONDITIONS TYP.

2-LVL BEAM SEE PLAN

NOTE: CRAWL SPACE WILL BE HEATED

3" CLR

MIN. 5'-0" BELOW FIN. GRADE OR BRG. ON SOUND BEDROCK G.C TO COOR. W/ GEO TECHNICAL CONSULTANT

2x4 STUD WALL

2-1 3/4" x 11 7/8" LAM. RIM

SIL. BEAMS

2x4 STUD WALL

G.C TO FIELD VERIFY SOLID WD. B NEW STUD W EXIST. STON

EXISTING STONE END WALL

8 A-5 SECTION "A"
1/4" = 1'-0"

9 A-5 SECTION "B"
1/4" = 1'-0"

Orig. application

STRUCTURAL NOTES

APPLICABLE CODE– Minnesota State Building Code, latest adopted edition.

DESIGN LOADS

A. Roof:
1. Snow Load
Pg (ground snow load)=50 PSF
Pf (snow load on flat roof)=38.5 PSF
[42 PSF at unheated structures]
Ce (exposure factor)= 1.0, partially exposed/terrain category B
Ct (thermal factor)= 1.1
[Ct=1.2 at unheated structures]
I (importance factor)= 1.0
Snow surcharge per ASCE 7–05
2. Dead Load=20 PSF

B. Floor/Porch:
1. Live Loads (Assembly Area with Movable Seating)=100 PSF
2. Dead Loads=18 PSF

C. Lateral: Earth– Typical cohesionless soil pressure assumed
Wind– Per ASCE 7–05

D. Seismic: No effect

E. Wind: 3–second gust speed at 33 feet= 90 MPH
Exposure B
Kd (directionality factor)= 0.85
Kzt (topographic factor)= 1.0
I (importance factor)= 1.0

SOIL PREPARATION AND FOUNDATIONS

A. Materials
1. Footings to bear on properly compacted fill, native soils, or sound bedrock capable of sustaining an assumed bearing pressure of 2,000 PSF in accordance with IBC latest edition Section 1804 (Class 4 material or better). Allowable bearing pressure to be verified by an independent testing agency. If soil appears to be of questionable quality or in a loose state, contact Engineer before proceeding with the work.
2. All fill material to be granular soil or other cohesionless material approved by the soil testing agency.

B. Installation Notes
1. Prior to installing foundations, soil to be field inspected by an independent testing agency familiar with the site to assure that the compaction specifications have been satisfied. Provide Special Inspection and material tests per schedule (see attached "Special Structural Testing and Inspection" schedule). Submit all inspection reports, material test reports,etc. to the Architect.
2. All fill material to be spread in maximum 6" loose lifts and compacted with vibratory compactors to a minimum 98% of the maximum dry density as determined by ASTM D698, Standard Proctor. Moisture content at the time of compaction should be controlled to within +/– 3% of the optimum moisture content. Contractor to verify these values with the Geotechnical Consultant prior to construction.
3. Soil compaction around and above utilities passing under foundations to conform to foundation compaction criteria.
5. Provide minimum 3'–6" soil cover for foundation frost protection along perimeter of heated areas, 5'–0" in isolated areas. Contractor to verify with Geotechnical Consultant prior to construction.

CONCRETE– SITE CAST

A. Design Code: ACI 318, ACI "Manual of Standard Practice...", latest adopted edition.

B. Materials
1. Minimum concrete strength at 28 days (f'c) for footings to be 3,000 psi.
2. Concrete supplier to submit concrete mix designs to Structural Engineer for all site cast concrete.
3. Furnish 5–7% air entraining agent for all concrete exposed to freezing temperatures.
4. Deformed bars– ASTM A615, Grade 60. Reinforcing steel bars shall be marked physically with same designations as shown on the structural drawings.

C. Provide Special Inspection and material tests per schedule (see attached "Special Structural Testing and Inspection" schedule). Submit all inspection reports, material test reports, etc. to the Structural Engineer.

D. Submit shop drawings for reinforcing steel.

E. Installation notes:
1. All items to be placed in accordance with approved shop drawings.
2. Support reinforcement only with CRSI recommended bar supports (wood, brick, etc. not acceptable) or hang from top of forms. Use supports with sand plates or horizontal runners for slab–on–grade reinforcement.
3. Concrete cover per ACI 318, latest adoption.
4. Place and securely tie footing dowels in position prior to concrete placement (i.e.: do not embed dowels into wet concrete).

MASONRY

A. Design Code: Masonry Standards Joint Committee Code (MJSC), latest adopted edition.

B. Provide Special Inspection and material tests per schedule (see attached "Special Structural Testing and Inspection" schedule). Submit all inspection reports, material test reports, etc. to the Structural Engineer.

C. Submit shop drawings for reinforcing steel, mix designs for grout and mortar and written report of all required tests.

D. Materials (concrete masonry)
1. Design f'm minimum 1,500 psi (net area compressive strength of masonry). Compressive strength of concrete masonry shall be determined by IBC 2006 Section 2105.2.2.1 or 2105.2.2.2. Contractor to verify/coordinate.
2. Hollow unit concrete masonry– ASTM C 90, Grade N, heavyweight (sand & gravel) units, kiln cured by high pressure steam (autoclave) or low pressure steam with carbonation. 28 day compressive strength (net area) minimum 3,000 psi.
3. Minimum corefill–grout strength at 28 days (f'c) to be 3,000 psi.
4. Mortar– per ASTM C 270 and C 476. Minimum requirements:
a. Type "S" for all below grade masonry.
b. Type "N" for all above grade and interior masonry.
5. Reinforcing steel
a. Deformed bar– ASTM A615, Grade 60. Reinforcing steel bars shall be marked physically with same designations as shown on the structural drawings.
b. Joint reinforcement (single wythe walls)– Dur–O–Wall D/A 320 LADUR"or approved equal conforming to ASTM A82 (hot dip galvanized).
c. For all types of joint reinforcing and masonry ties: Contractor to coordinate with architectural requirements.

E. Installation Notes
1. Block supplier shall provide test reports to Engineer showing compressive strength values for masonry units.
2. Provide joint reinforcement every block course in stack bond walls, every other course in running bond walls.
3. Reinforcement lap splices shall be in accordance with Lap Splice Schedule on plan. Dowel vertical reinforcement to footings.
4. Discontinue joint reinforcement at control joints. Bond beam reinforcement to run continuous through joints.

STEEL– STRUCTURAL

A. Design Code: "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" (AISC), latest adopted edition.

B. Materials:
1. ASTM A992– All W–Shape beams and channels deeper than 5"
2. ASTM A36– Channels 5" and shallower, angles, plates, and bars
3. ASTM A53, Grade B– Pipe shapes (min. Fy = 35 ksi).
4. ASTM A500, Grade B– Tubular shapes (min. Fy = 46 ksi).
5. Connection bolts– ASTM A325.
6. Welding electrodes– ASTM A233 E–70 series.
7. Anchor bolts– ASTM F1554, Grade 36.

C. Provide Special Inspection and material tests per schedule (see attached "Special Structural Testing and Inspection" schedule). Submit all inspection reports, material test reports, etc. to the Structural Engineer.

D. Submit shop drawings.

E. Installation Notes
1. Shop and field welding to be per AWS D1.1, latest adopted edition, and performed only by certified welders.
2. Steel supplier is responsible for designing and detailing all connections not shown on drawings for working loads shown on plans.
3. Paint steel per AISC Spec. Section M3.
4. Provide corrosion resistant coating around all structural steel below grade.

LUMBER

A. Design Code: "National Design Specification for Wood Construction", latest adopted edition.

B. Materials:
1. All members designated as "LVL" to have the following minimum allowable design values: Fb=2,600 psi, Fv=285 psi, Fc (parallel to grain)=2,310 psi, Fc (perpendicular to grain, parallel to glue line)=750 psi, and E=1,900 ksi. Provide nailing/bolting connection for multiple piece beams per manufacturer's specifications. Verify top or side loading condition.
2. PSL members– Minimum allowable design values:
a. Beams: Fb=2,900 psi, Fv=290 psi (210 psi when horizontal shear is parallel to wide face of strands), Fc (parallel to grain)=2,900 psi, Fc (perpendicular to grain, parallel to wide face of strands)=650 psi, Fc (perpendicular to grain, perpendicular to wide face of strands)=480 psi, and E=2,000 ksi. Provide nailing/bolting connection for multiple piece beams per manufacturer's specifications unless noted otherwise on plan. Verify top or side loading condition.
b. Columns: Fb=2,400 psi, Fc (parallel to grain)=2,400 psi, and E=1,800 ksi.
3. Dimension Lumber
a. Joists and beams– minimum design values except as noted on the plans: Fb=850 psi, Fv=135 psi, E=1,300 ksi, Fc (parallel to grain)=1,150 psi, and Fc (perpendicular to grain)=405 psi.
b. Wall studs– minimum design values: Fb=675 psi, Fv=135 psi, E=1,200 ksi, Fc (parallel to grain)=726 psi, and Fc (perpendicular to grain)=405 psi.
c. All lumber to have maximum moisture content of 19%.
4. Plywood
a. Plywood subfloor and roof sheathing to be C–D INT–APA– minimum thickness per IBC 2006 for loads and spans shown on plans or notes.
b. Underlayment to be 1/2 inch C–C PLUGGED EXT–APA.
5. Fasteners and Connection Hardware
a. Provide fasteners per the "National Design Specification for Wood Construction", latest edition. Assume nails to be common nails meeting the requirements in ASTM F1667 unless noted otherwise.
b. All connection hardware by "Simpson Strong–Tie" or approved equal. Connectors in contact with treated lumber to be fabricated with material to resist corrosive reaction with wood treating chemicals.
c. All prefabricated metal connectors to be fully nailed per supplier's specifications.

C. Installation Notes
1. Protect all glue–laminated members from exposure to weather. Store "PSL's" or "LVL's" in a vertical position.
2. Provide bridging in accordance with Part 4, Section 4.4.1 of the National Design Specification for Wood Construction, latest adopted edition.
3. Extend all columns to foundation system. Block solid at all floors.
4. All nailing performed according to IBC 2006, Table 2304.9.1 unless otherwise noted.
5. Connect sill plate to foundation walls as shown on plan. Add 1 bolt within 12" of plate ends/joints.

D. Submit design calculations and shop drawings for wood trusses and other wood structural members (except for dimension lumber). Shop drawings must include erection plan(s) with mark numbers corresponding to engineered members. Include Combined Stress Index for all elements. All shop drawing documents to be certified by a Structural Engineer licensed in the State of Minnesota.

SHOP DRAWINGS/MISCELLANEOUS

A. Engineer will review Contractor's shop drawings with respect to the ability of the detailed work, when complete, to be a properly functioning integral element of the overall system designed by Engineer. Before submitting a shop drawing or any related material to Engineer, Contractor shall: Review each such submission for conformance with the means, methods, techniques, sequences and operations of construction, and safety precautions and programs incidental thereto, all of which are the sole responsibility of the Contractor/approve each such submission before submitting it/and so stamp each such submission before submitting it. Engineer shall assume that no shop drawing or related submittal comprises a variation unless Contractor advises Engineer otherwise via a written instrument which is acknowledged by Engineer in writing. Shop drawing(s) called for are indicated in the material specifications. Engineer shall return shop drawings with comments provided that each submission has been called for and is stamped by Contractor as indicated above. Engineer shall return without comment material not called for or which has not been approved by Contractor.

B. Placement of mechanical units supported by roof or floor structure is subject to the approval of the Engineer.

C. Verify all existing conditions and dimensions. Report all conflicts in construction documents or between construction documents and actual conditions to the Engineer before proceeding with the affected work.

D. Contractor is responsible for bracing all structural elements, without overstressing, until project is complete. This includes bracing of existing adjacent structures and soils. Stockpiling of materials on supported levels is at Contractor's own risk.

E. Install all anchors noted (expansion, epoxy, powder actuated, etc.) per Manufacturer's specifications.

F. In no case shall dimensions be scaled from plans, sections or details on the structural drawings.

SPECIAL STRUCTURAL TESTING AND INSPECTION — PERMIT NO. _____ (1)

DESCRIPTION (2)	TYPE OF INSPECTOR (3)	REPORT FREQUENCY	ASSIGNED FIRM (4)
4. CONCRETE: SPECIAL INSPECTION NOT REQ'D. FOR FOUNDATIONS (FOUND'S. DESIGNED FOR f'c=2500 PSI, f'c=3000 PSI REQ'D. IN PLACE) AND NON-STRUCTURAL SLABS ON GRADE		NOT REQUIRED	
4. REINFORCING STEEL, PRIOR TO CLOSING OF FORMS OR CONCRETE DELIVERY ON JOB SITE (ITEM 1 OF TABLE 1704.4)	SIT	PERIODIC	
3. FIELD WELDING ETC. FOR WELDS ≤ 5/16"	SIT	PERIODIC	
3.3 HIGH STRENGTH BOLTING	SIT	PERIODIC	
5. STRUCTURAL MASONRY	SIT	PER LEVEL I SPECIAL INSPECTION REQUIREMENTS (TABLE 1704.5.1)	
7. SPECIAL GRADING, EXCAVATION AND FILLING	SIT	PERIODIC	
13. SPECIAL CASES: ANCHOR CONNECTIONS TO EXIST. STONE AND NEW MASONRY/CONCRETE	SIT	PERIODIC OR IN ACCORDANCE WITH ANCHOR SUPPLIER'S SPECIFICATIONS (WHICHEVER IS MORE RESTRICTIVE)–GC TO COORD. WITH ANCHOR SUPPLIER	

(1) PERMIT NO. TO BE PROVIDED BY THE BUILDING OFFICIAL.
(2.) PER I.B.C. SECTION 1704, AS ADOPTED BY MINNESOTA STATE BUILDING CODE.
(3.) SPECIAL INSPECTOR– TECHNICAL ("SIT"– USUALLY AN EMPLOYEE OF THE TESTING AGENCY.), SPECIAL INSPECTOR– STRUCTURAL ("SIS"– USUALLY AN EMPLOYEE OF THE STRUCTURAL ENGINEER OF RECORD)
(4.) FIRM CONTRACTED TO PERFORM SERVICES (FILL IN BY OWNER OR ARCHITECT OR STRUCTURAL ENGINEER OF RECORD ACTING AS AGENT OF OWNER)
(5.) THIS SCHEDULE ONLY REFERS TO SPECIAL INSPECTION AND DOES NOT SUBSTITUTE FOR ANY ORDINARY TESTING REQUIRED BY I.B.C. OR OTHER APPLICABLE CODES.

COLUMN SCHEDULE

MARK	SIZE	REMARKS
C1	2-2x TO BM. BRG. 2-2x FULL WALL HT.	
C2	3-2x TO BM. BRG.	
C3	HSS 3x3x3/16 STUB COL.	CAP/BASE PL: SEE SECT. 2/S1
C4	HSS 3x3x1/4	CAP/BASE PL: SEE SECT. 3/S1
C5	6x6 WOOD COL.	• SEE ARCH. FOR MATERIAL (EXPOSED TO WEATHER) • SEE SECT. -/S- FOR BASE

NOTES:
1. WOOD COLUMNS SHALL RUN CONTINUOUS FROM BEAM BEARING TO WOOD PL AT FND. WALL. BLOCK SOLID AT FLOOR FRAMING.
2. 2x'S TO MATCH STUD WALL WIDTH TYP. U.N.O.

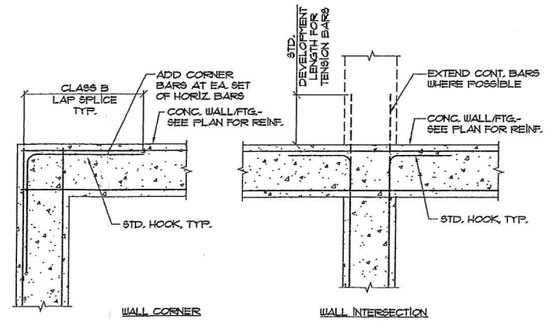
REINF. LAP SPLICE SCHEDULE (CMU)

BAR #	BAR LAP
#4	24"
#5	30"

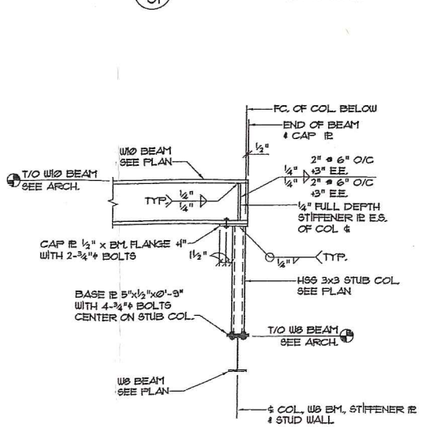
REINFORCING LAP SPLICE SCHEDULE (CONCRETE)

BAR #	f'c = 3,000 PSI	f'c = 4,000 PSI
#4	29"	25"
#5	36"	31"

LAP SPLICES TYPICAL U.N.O. ON PLAN OR IN SECTION

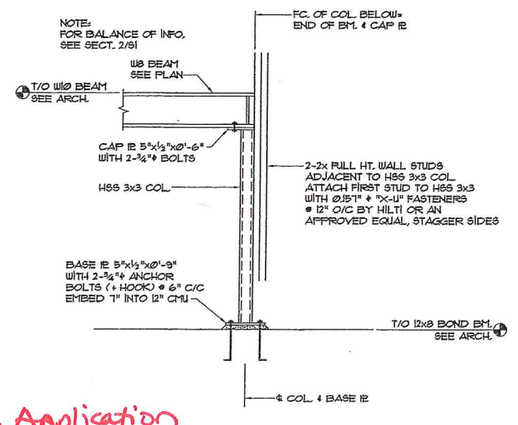


1/S1 PLAN DETAILS — NOT TO SCALE



2/S1 SECTION — NOT TO SCALE

Orig. Application



3/S1 SECTION — NOT TO SCALE

FOUNDATION PLAN NOTES (SEE PLAN 1/A-5):
1. PROVIDE LAP SPLICES FOR REINF. PER SCHEDULE ON SHEET S1 SHEET, TYPICAL U.N.O.
2. PROVIDE CORNER BARS IN WALLS AND FOOTINGS PER PLAN DETAIL 1/S1.
3. INFORMATION REGARDING EXIST. FRAMING AND FOUNDATIONS WAS OBTAINED DURING LIMITED VISUAL OBSERVATIONS. GC TO NOTIFY THE A.O.R. REGARDING ANY CONFLICTS BETWEEN THE CONSTRUCTION DOCUMENTS AND THE ACTUAL CONDITIONS FOUND IN THE FIELD PRIOR TO COMMENCING WORK IN THAT AREA.

FLOOR AND ROOF FRAMING PLAN NOTES (SEE PLANS 2/A-5 AND 3/A-5):
1. PROVIDE "HU25A" ANCHORS BY "SIMPSON" OR AN APPROVED EQUAL AT EA. RAFTER BEARING LOCATION.
2. C1, ETC. INDICATE COLUMNS. SEE SCHEDULE ON SHEET S1.
3. INFORMATION REGARDING EXIST. FRAMING AND FOUNDATIONS WAS OBTAINED DURING LIMITED VISUAL OBSERVATIONS. GC TO NOTIFY THE A.O.R. AND E.O.R. REGARDING ANY CONFLICTS BETWEEN THE CONSTRUCTION DOCUMENTS AND THE ACTUAL CONDITIONS FOUND IN THE FIELD PRIOR TO COMMENCING WORK IN THAT AREA.

ALIGN Structural, Inc.
241 Cleveland Avenue South, Suite B7
Saint Paul, Minnesota 55105
(t) 651.698.0164 (f) 651.698.0165

PROJECT TITLE:
FRAME BUILDING-445 SMITH AVENUE
SAIT PAUL, MN

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
NAME: RICHARD W. JOHNSON
SIGNATURE:
DATE: 7-14-14 REG.# 23406

Revisions

STRUCTURAL NOTES AND SCHEDULES

Project No.	14207
Drawn by	RWJ
Checked by	RWJ
Date	7-14-14

SHEET
S1