

PITTSFIELD VILLAGE COMDOMINIUMS

Structural Alterations to Roofs and Attics to support solar panel installations 2220 Pittsfield Blvd, Ann Arbor MI 48103

DRAWING INDEX

indicates included sheets ■

- T-1.0 ■ DRAWING INDEX & SITE PLAN
- A-1.0 ■ EXISTING BASEMENT AND FIRST FLOOR PLANS
- A-1.1 ■ EXISTING STRUCTURAL CROSS SECTIONS
- S-1.0 ■ PROPOSED BASEMENT & FIRST FLOOR STRUCTURE
- S-2.0 ■ PROPOSED STRUCTURAL CROSS SECTIONS
- S-3.0 ■ PROPOSED STRUCTURAL DETAILS

ASSOCIATION CHARGE TO CONSULTANTS

Some owners have proposed to install roof mounted solar panels. The Association has instructed the Consultants to provide a detailed analysis of the structural conditions affecting the roof and to provide a uniform method of evaluating whether solar panels can be installed without additional structural modifications and what structural work needs to be accomplished if the roof needs to be reinforced. The drawings are intended to guide homeowners, their builders and the Association management to make the necessary structural modifications when solar panels are to be installed.

The Association provided the Consultants with the original Charles Nobel Architectural drawings which were photographed and used to draw portions of the existing structure. Several changes made in the field during construction are now noted on our drawings.

One vacant unit (3425 Edgewood) was inspected in a previous report from April of 2011. Additional unit attics at 2322 thru 2332 were reviewed for this report and a structural analysis of the roof / ceiling system was conducted.

SUMMARY OF EXISTING ROOF STRUCTURAL SYSTEM

1. (Section B1-B1) The living room ceiling and roof assembly consists of 2"x 6" rafters 24" on center tied together with 2" x 6" ceiling joists approximately 1/3 the distance up the rafters. This provides a generous 9' 4" ceiling height in the living room but has introduced severe structural problems by overstressing the rafters.

The ceiling has deflected noticeably downward, (approximately 3/4") in the units inspected. Management has indicated that this is typical throughout the complex. This condition also results in the outward tilt of the exterior walls. Our structural analysis has shown the rafters are severely overstressed where the ceiling collar ties are attached.

A review of the original drawings shows a necessary attic structural beam was not installed in this unit and possibly not in the remainder of the units. The drawings address this problem and how to correct further sagging and rafter overstressing. If Solar panels are to be added to this section of the roof these repairs must be made.

2. (Section A1-A1) The dining alcove and kitchen ceiling / roof assembly consists of 2"x 6" rafters 24" on center tied together with 2"x 6" ceiling joists. The joists are approximately 1/3 up the rafters on the dining alcove side and at a lower 8' 0" height on the kitchen ceiling side. The ceiling joists are partially supported by a bearing wall running between the kitchen and dining alcove. This hybrid system imposes lower structural stresses on the rafters but structural problems still are created.

SUMMARY OF EXISTING ROOF STRUCTURAL SYSTEM (CONT)

Simpler structural improvements in this part of the attic should be installed to prevent possible rafter failure and additional outward deflection of the building walls. See structural drawings on page S2.0 for this work. If Solar panels are to be added to this portion of the roof these repairs must be made. See sheet S2.0.

3. (Section C1-C1) The bedroom ceiling and roof assembly consists of roof trusses made by overlapping web diagonal members and plywood gusset plates installed on one side of the truss. All connections were hand nailed. Structural analysis of this truss shows insufficient fastening at all truss web member joints. If additional permanent loads, ie. solar panels, are to be installed on this portion of the roof additional structural strengthening is required. See sheet S2.0 for one solution.

SUMMARY OF POSSIBLE REPAIRS

The attic above the kitchen and dining alcove (SECTION A1-A1) is easiest to reinforce. Here, vertical king posts could be installed above the kitchen bearing wall.

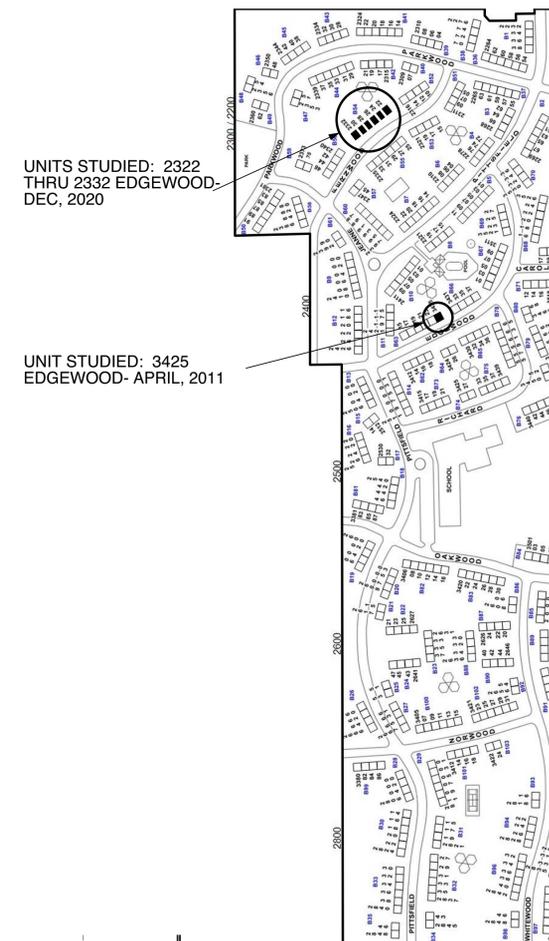
1. The area over the living room is more complex as a beam must be installed by removing a portion of the louvered attic ventilation system and installing a 16 foot long beam under the existing ridge board. Supporting the heavy loads at each end of the beam is harder to accomplish as the walls below the beam's location have openings which makes the transfer of loads to the foundation more difficult. Section 3 on page S2.0 shows how this can be accomplished.

2. The attic above the bedrooms and bath where trusses were installed was analyzed (Section C1-C1). While the individual truss members may be adequate in size, the gusset plates at web connections were not adequately sized or properly nailed. The compression and tensile forces acting on the gussets could fail under code anticipated heavy roof snow loads.

It may be possible to access the attic and install additional gusset plates on the truss web connections and to provide additional nailing. Since access is very poor it would probably be easier to strip the lower edge of the roof shingles and sheathing a couple feet up and install new LVLs (Laminated Veneer Lumber) joists the full width of the attic. These new joists would then be screwed to each existing truss. The drawings show the size and configuration of such joists. This could most easily be accomplished during reroofing. See Building Section 1 Sheet S2.0.



PHOTO ABOVE
One end of a typical four or six unit building. The prominent chimneys divide units. A typical unit consists of a one story living room and kitchen element over a crawl space and one or two bedrooms over a raised basement containing a laundry and mechanical area.

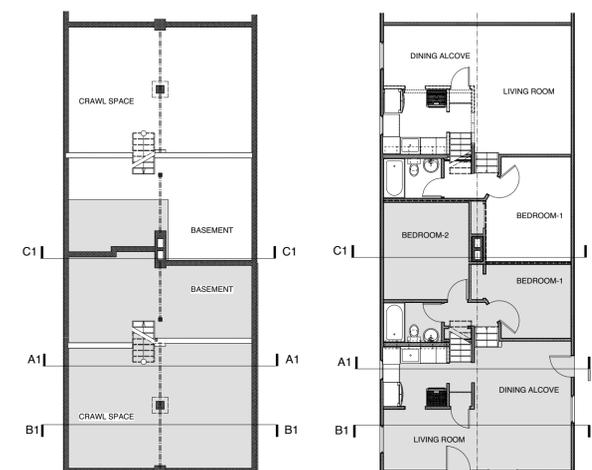


UNITS STUDIED: 2322
THRU 2332 EDGEWOOD-
DEC, 2020

UNIT STUDIED: 3425
EDGEWOOD- APRIL, 2011

MAP OF PITTSFIELD VILLAGE

No Scale, Map from
Pittsfield Village
Condominiums Web Site



KEY PLAN OF HALF BUILDING

No Scale, shaded area indicates unit under study

DRAFT REPORT: 01 13 21

DRAWING INDEX & SITE PLAN

SHEET TITLE:

REVIEW SET: 01.17.21

T-1.0

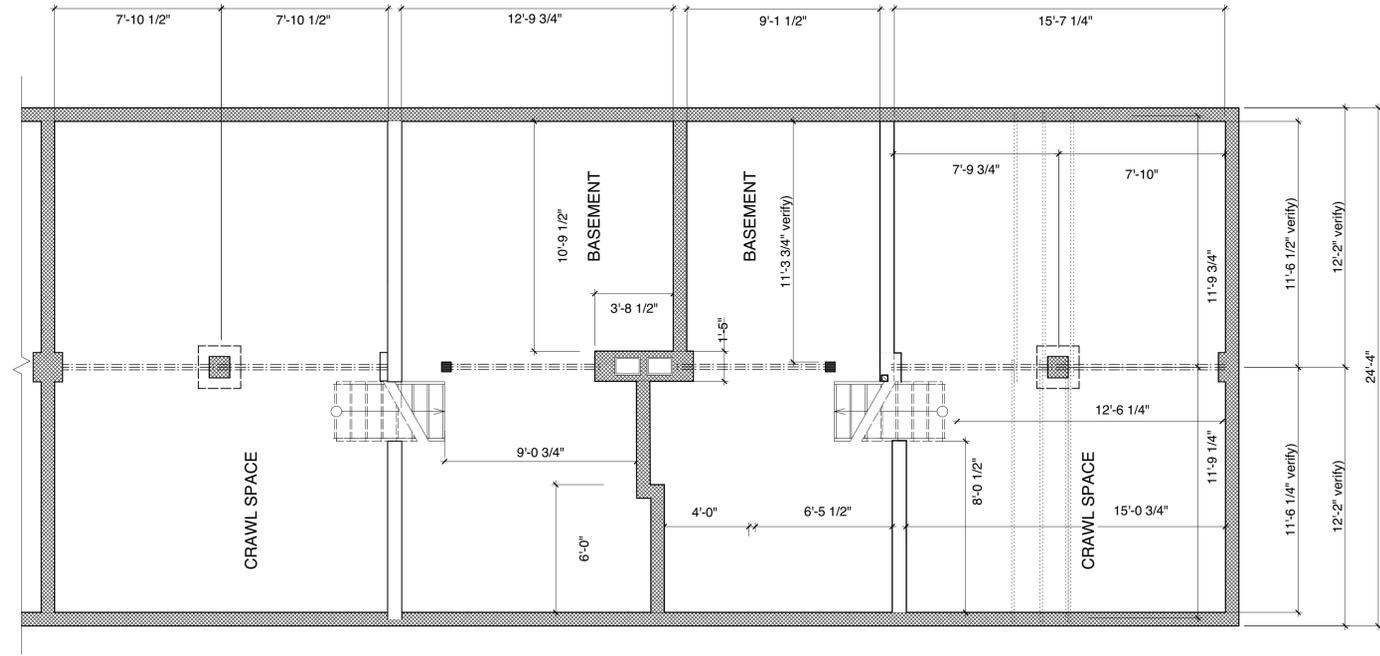
PITTSFIELD VILLAGE COMDOMINIUMS
Structural Alterations to roofs and attics

RAA : 20-018

RUETER ASSOCIATES

A R C H I T E C T S
515 Fifth Street, Ann Arbor, Michigan 48103
phone: (734) 769-0070, fax: (734) 769-0167

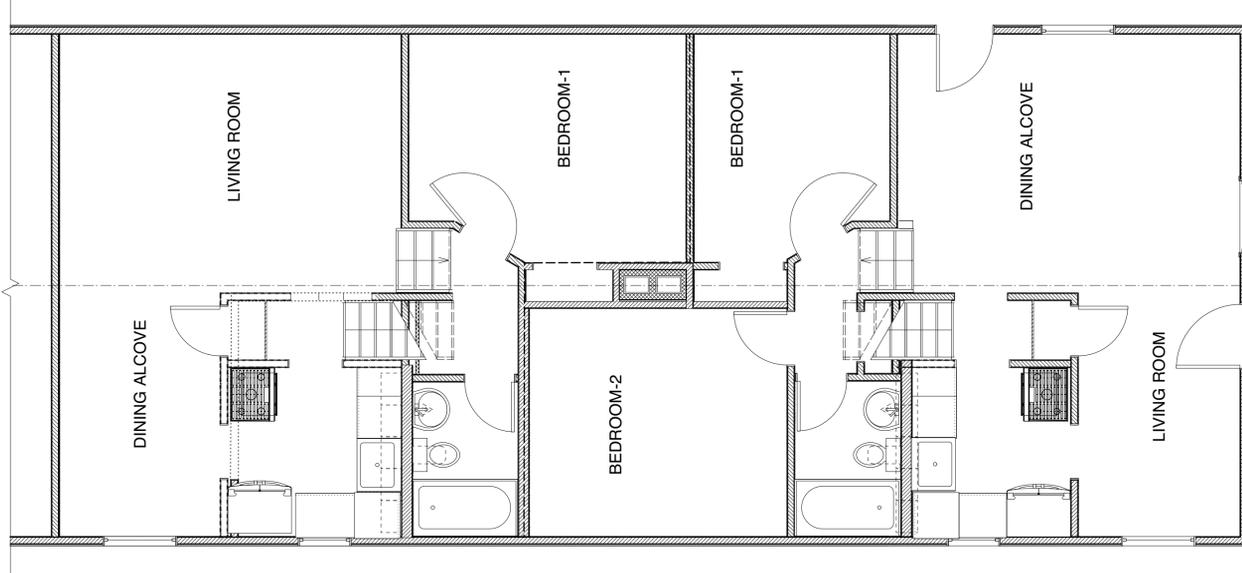
2220 Pittsfield Blvd, Ann Arbor, Michigan, 48104
RAA : 20-018



PARTIAL BASEMENT PLAN (EXISTING)
 Scale: 1/4" = 1'-0" on 24" x 36"
 3/32" = 1'-0" on 24" x 36"

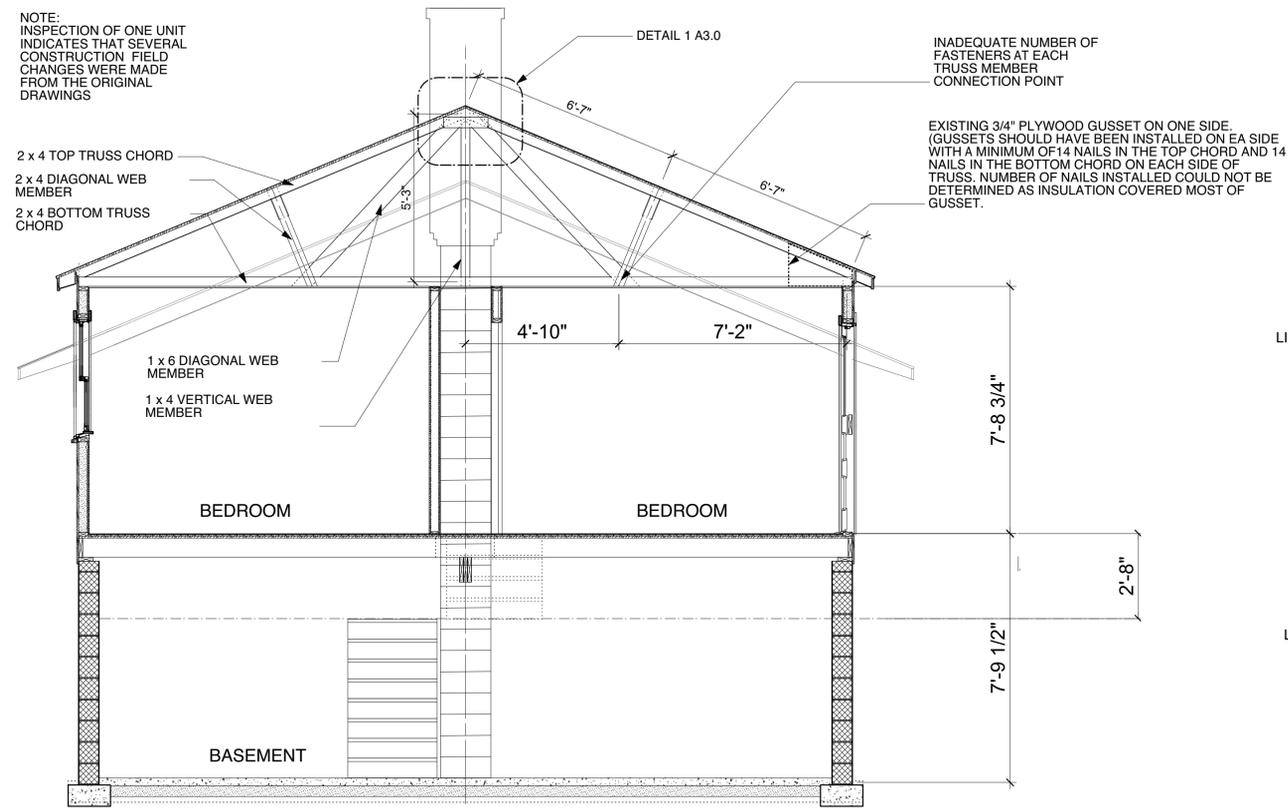
NOTE:
 ALL DIMENSIONS IN THIS
 DRAWING ARE BASED UPON
 ORIGINAL DRAWINGS AND
 HAVE NOT BEEN FIELD
 VERIFIED

NOTE:
 INSPECTION OF SEVERAL
 UNITS INDICATES THAT
 CONSTRUCTION FIELD
 CHANGES WERE MADE FROM
 THE ORIGINAL DRAWINGS



PARTIAL FIRST FLOOR PLAN AND BEDROOM LEVEL (EXISTING)
 Scale: 3/16" = 1'-0" on 24" x 36"
 3/32" = 1'-0" on 24" x 36"

NOTE: INSPECTION OF ONE UNIT INDICATES THAT SEVERAL CONSTRUCTION FIELD CHANGES WERE MADE FROM THE ORIGINAL DRAWINGS

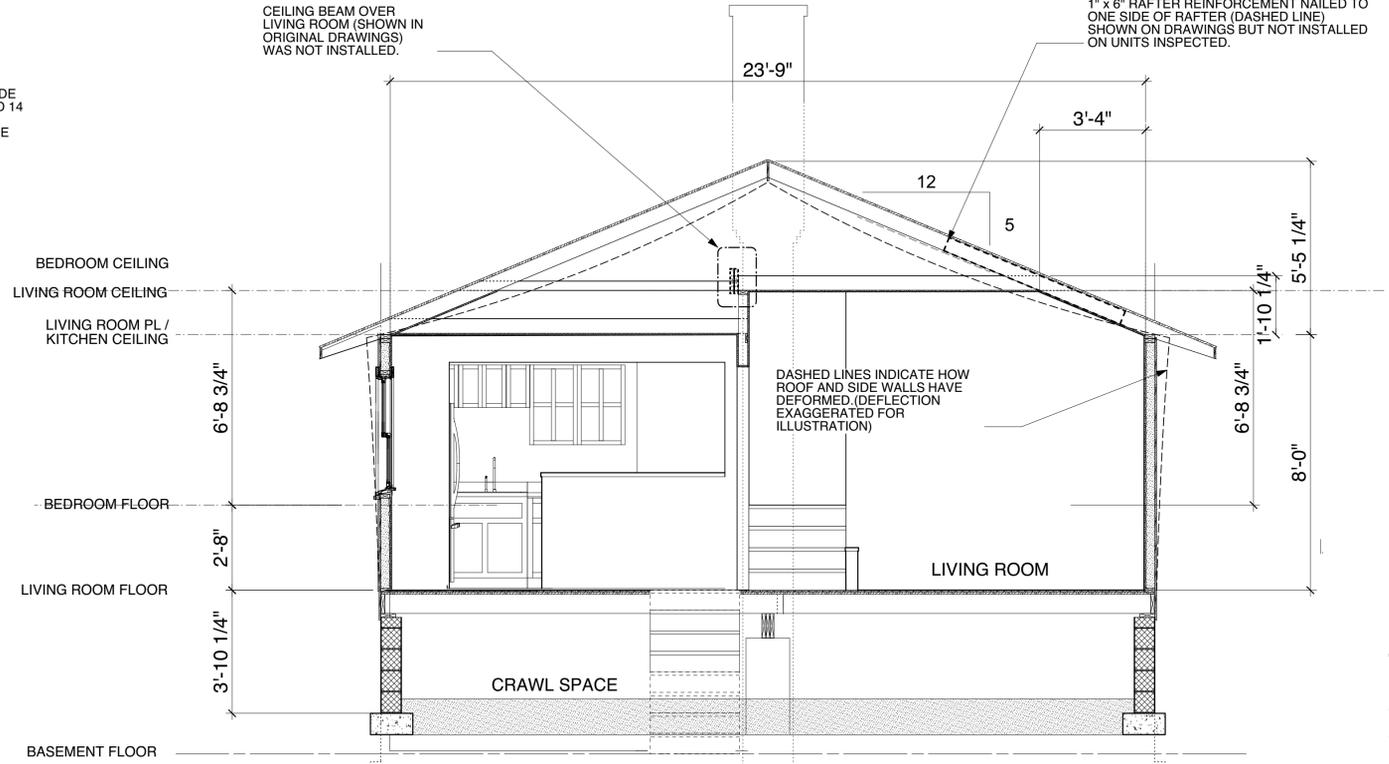


1 EXISTING BUILDING SECTION AT C1-C1
 Scale: 3/8" = 1'-0" on 24" x 36"
 3/16" = 1'-0" on 12" x 36"

INADEQUATE NUMBER OF FASTENERS AT EACH TRUSS MEMBER CONNECTION POINT

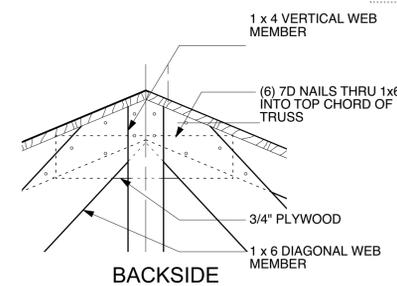
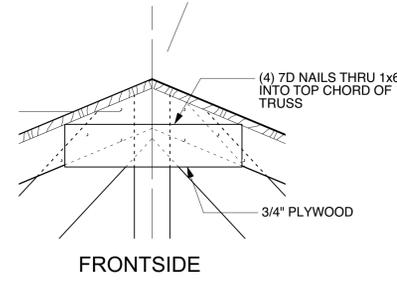
EXISTING 3/4" PLYWOOD GUSSET ON ONE SIDE. (GUSSETS SHOULD HAVE BEEN INSTALLED ON EA SIDE WITH A MINIMUM OF 14 NAILS IN THE TOP CHORD AND 14 NAILS IN THE BOTTOM CHORD ON EACH SIDE OF TRUSS. NUMBER OF NAILS INSTALLED COULD NOT BE DETERMINED AS INSULATION COVERED MOST OF GUSSET.)

CEILING BEAM OVER LIVING ROOM (SHOWN IN ORIGINAL DRAWINGS) WAS NOT INSTALLED.



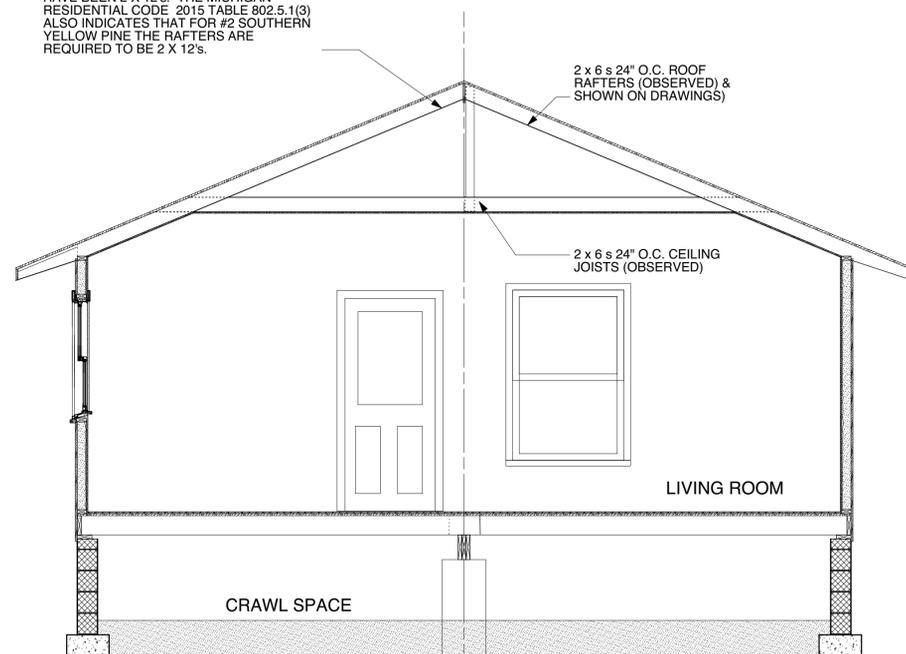
4 EXISTING BUILDING SECTION AT B1-B1
 Scale: 3/8" = 1'-0" on 24" x 36"
 3/16" = 1'-0" on 12" x 36"

NOTE: ALL DIMENSIONS IN THIS DRAWING ARE BASED UPON ORIGINAL DRAWINGS AND HAVE NOT BEEN FIELD VERIFIED

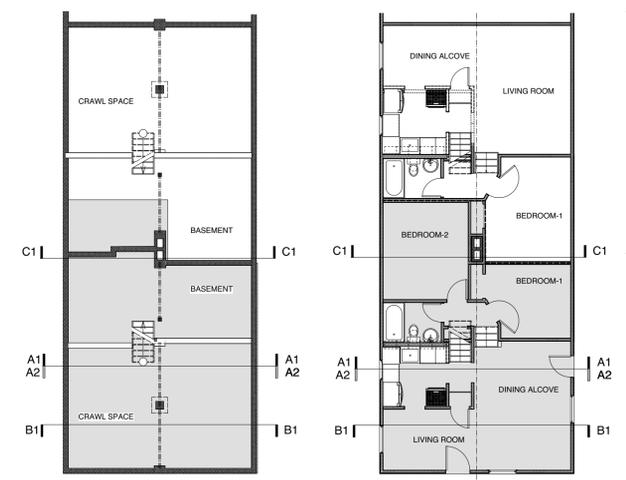


DETAIL 1 A3.0
 Scale: 3" = 1'-0" on 24" x 36"
 1-1/2" = 1'-0" on 12" x 36"

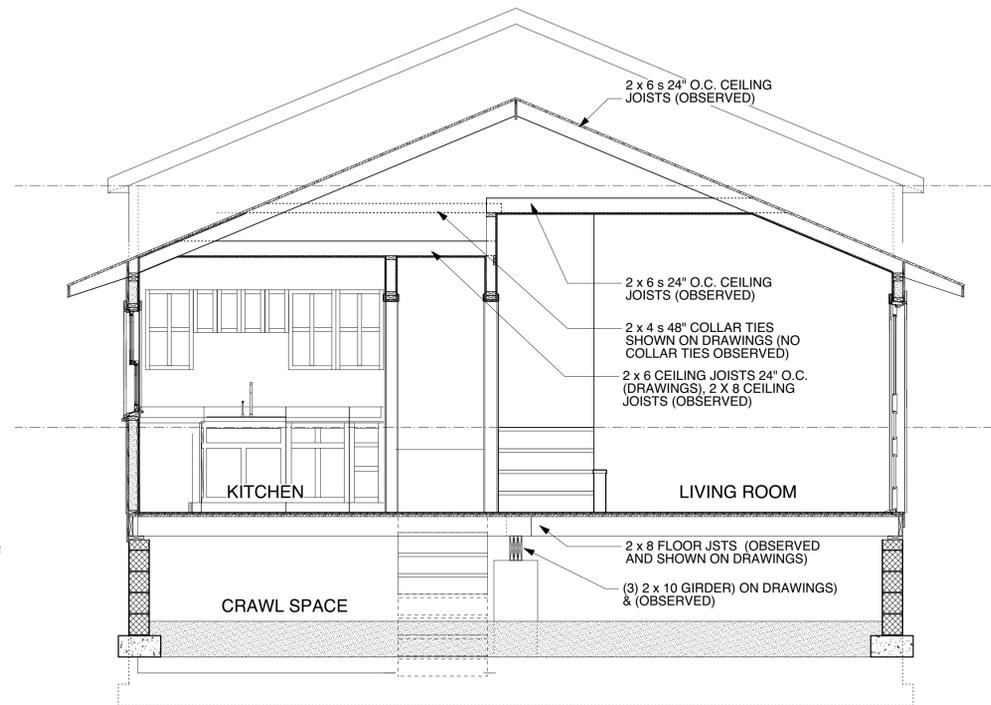
STRUCTURAL ANALYSIS SHOWS THAT FOR COLLAR TIES TO BE PLACED AT THE HEIGHT INDICATED THE RAFTERS SHOULD HAVE BEEN 2 X 12's. THE MICHIGAN RESIDENTIAL CODE 2015 TABLE 802.5.1(3) ALSO INDICATES THAT FOR #2 SOUTHERN YELLOW PINE THE RAFTERS ARE REQUIRED TO BE 2 X 12's.



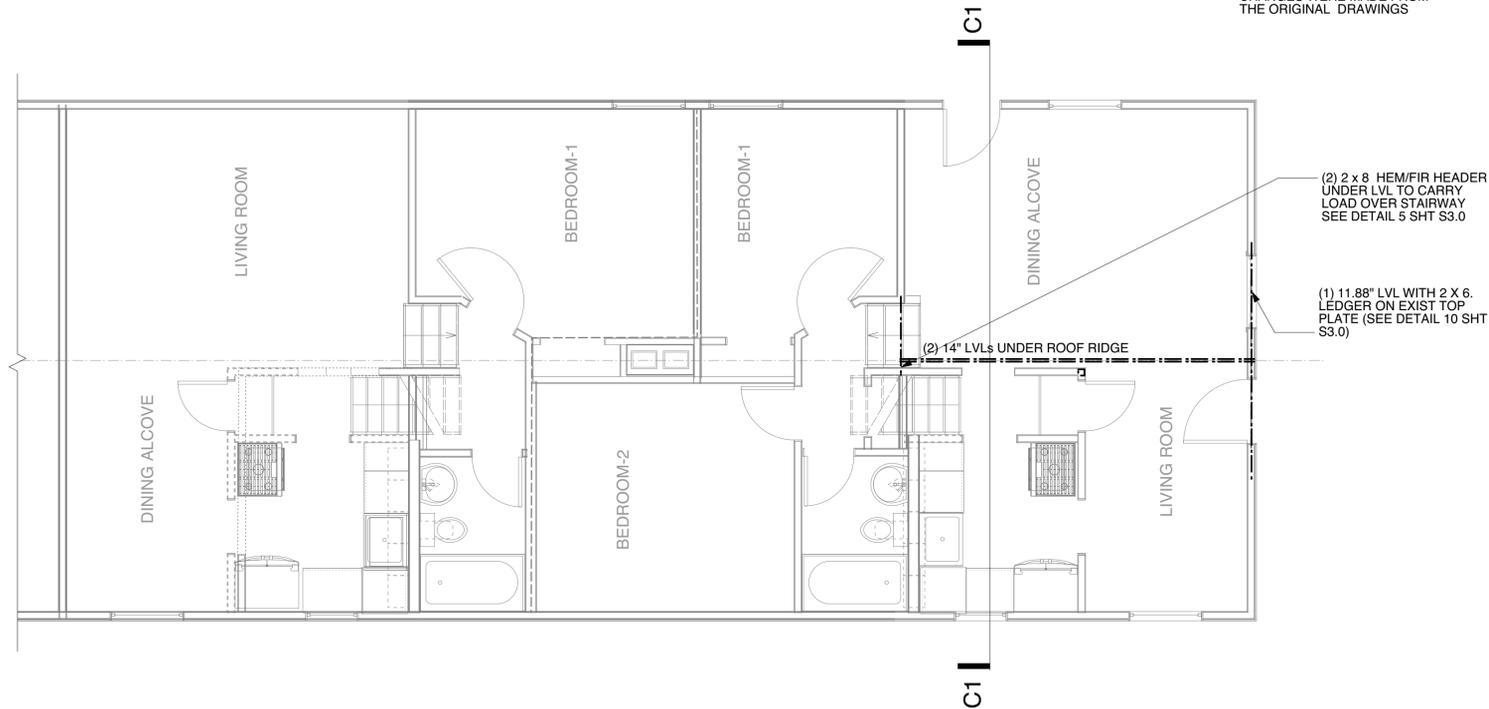
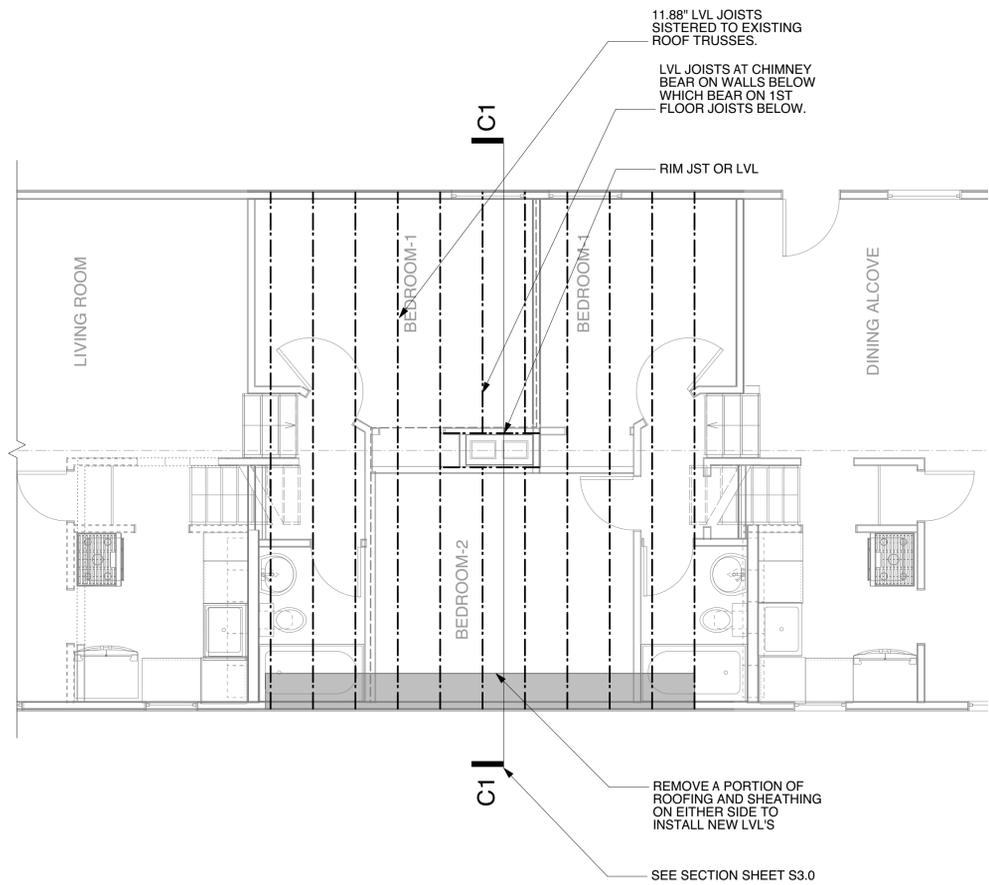
3 EXISTING BUILDING SECTION AT B1-B1
 Scale: 3/8" = 1'-0" on 24" x 36"
 3/16" = 1'-0" on 12" x 36"



1 REFERENCE PLANS FOR END UNIT
 Scale: 1/8" = 1'-0" on 24" x 36"
 1/16" = 1'-0" on 12" x 18"



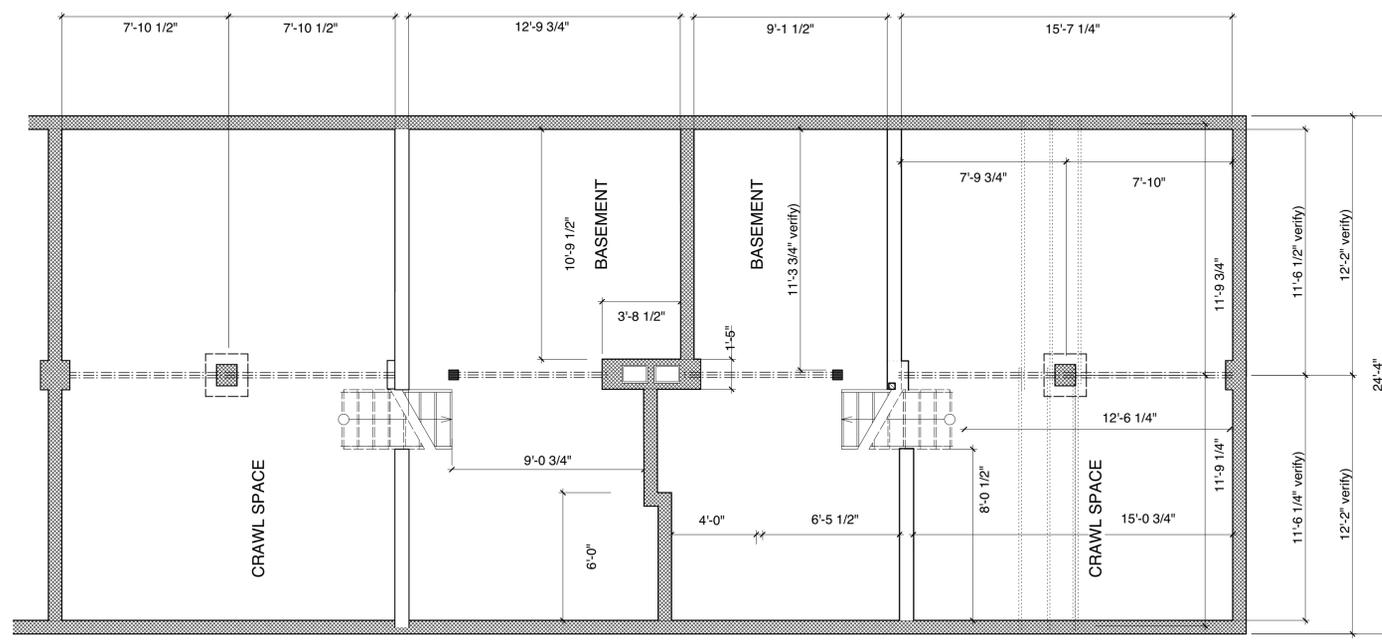
2 EXISTING BUILDING SECTION AT A1-A1
 Scale: 3/8" = 1'-0" on 24" x 36"
 3/16" = 1'-0" on 12" x 36"



PARTIAL FIRST FLOOR PLAN PROPOSED
 Scale: 3/16" = 1'-0" on 24" x 36"
 3/32" = 1'-0" on 24" x 36"

NOTE:
 ALL DIMENSIONS IN THIS
 DRAWING ARE BASED UPON
 ORIGINAL DRAWINGS AND
 HAVE NOT BEEN FIELD
 VERIFIED

NOTE:
 INSPECTION OF ONE UNIT
 INDICATES THAT SEVERAL
 CONSTRUCTION FIELD
 CHANGES WERE MADE FROM
 THE ORIGINAL DRAWINGS



PARTIAL BASEMENT PLAN
 Scale: 1/4" = 1'-0" on 24" x 36"
 3/32" = 1'-0" on 24" x 36"

DRAFT REPORT: 01 13 21

LOWER AND UPPER FLOOR PLANS

PITTSFIELD VILLAGE COMDOMINIUMS
 Structural Alterations to roofs and attics

RAA : 20-018

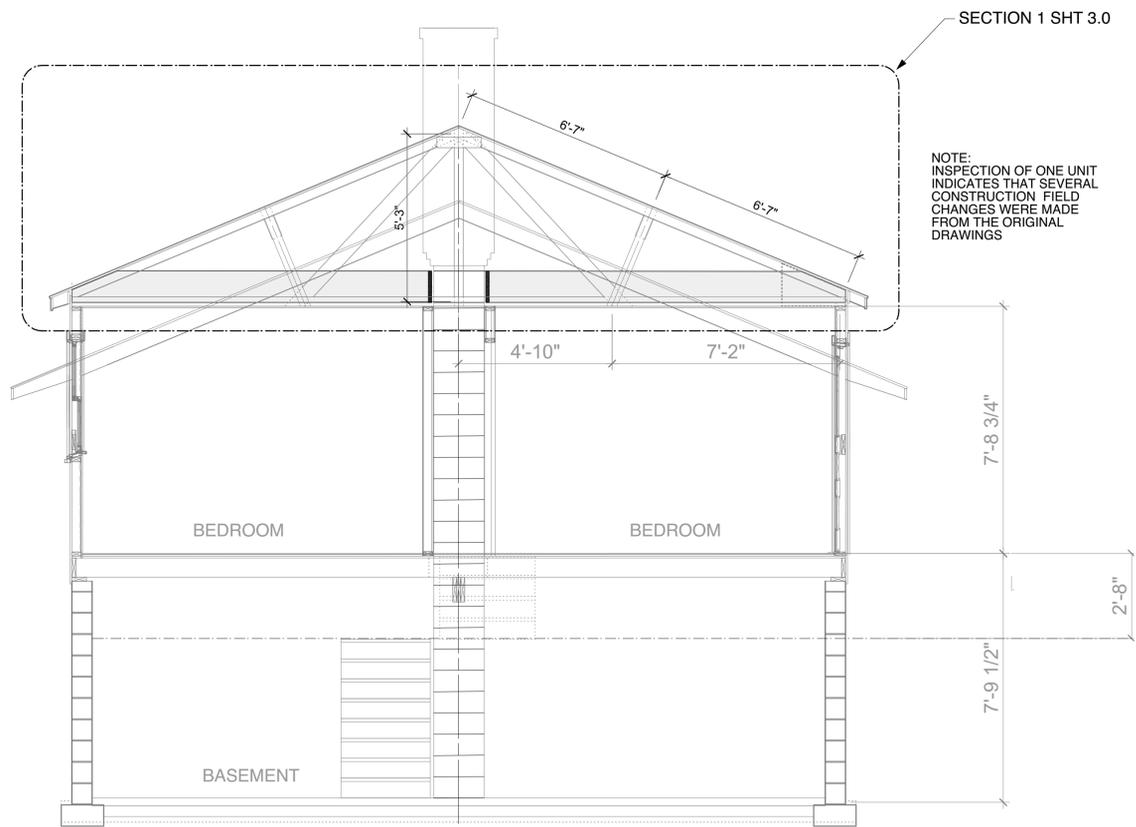
RUETER ASSOCIATES

REVIEW SET: 01.17.21

2220 Pittsfield Blvd, Ann Arbor, Michigan, 48104

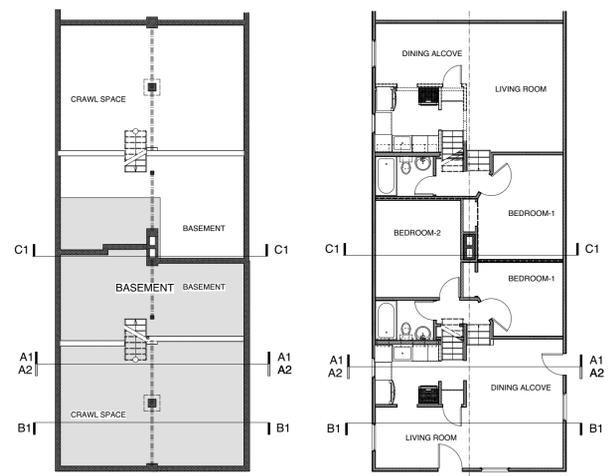
A R C H I T E C T S
 515 Fifth Street, Ann Arbor, Michigan 48103
 phone: (734) 769-0070, fax: (734) 769-0167

A1.0



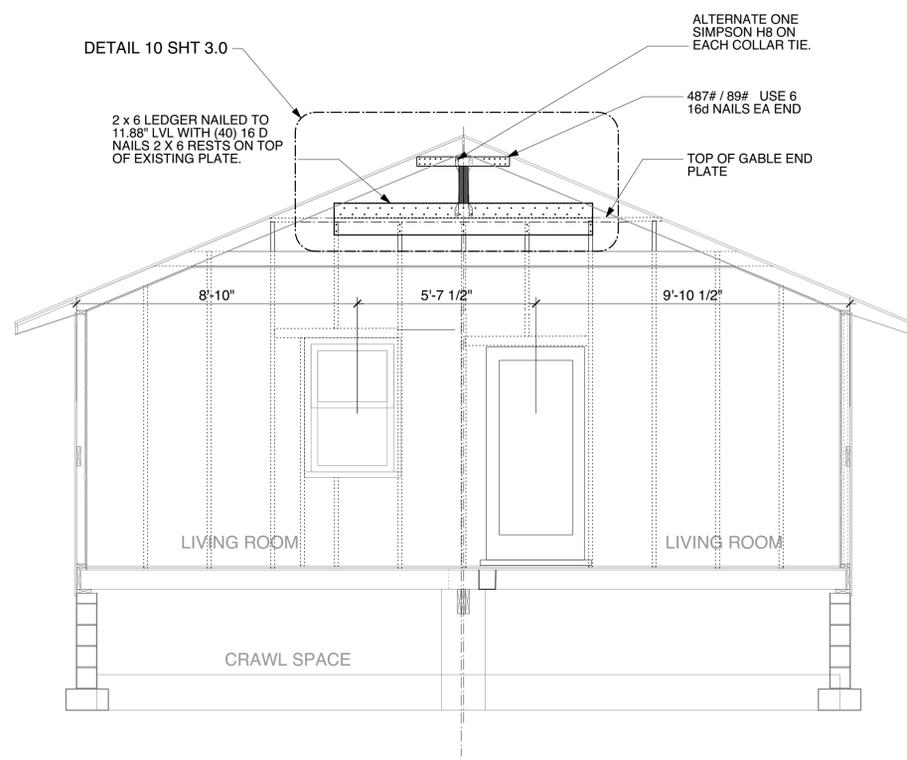
1 BUILDING SECTION AT C1-C1

Scale: 3/8" = 1'-0" on 24" x 36"
3/16" = 1'-0" on 12" x 36"



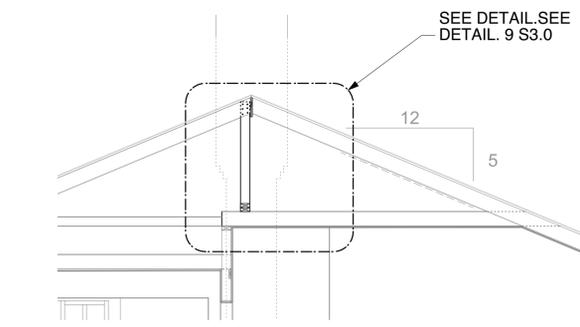
REFERENCE PLANS

Scale: 3/32" = 1'-0" on 24" x 36"
3/64" = 1'-0" on 12" x 18"



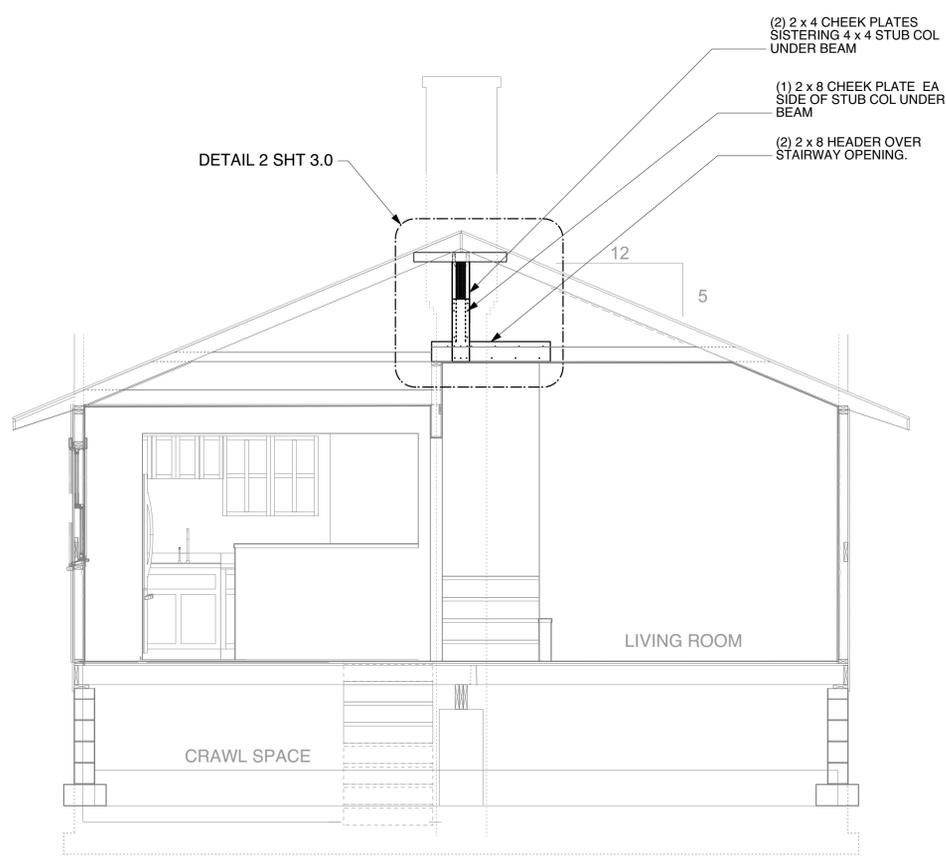
2 NEW BUILDING SECTION AT B1-B1

Scale: 3/8" = 1'-0" on 24" x 36"
3/16" = 1'-0" on 12" x 36"



3 BUILDING SECTION AT A1-A1

Scale: 3/8" = 1'-0" on 24" x 36"
3/16" = 1'-0" on 12" x 36"



4 BUILDING SECTION AT A1-A1

Scale: 3/8" = 1'-0" on 24" x 36"
3/16" = 1'-0" on 12" x 36"

DRAFT REPORT: 01 13 21

NEW STRUCTURAL CROSS SECTIONS

SHEET TITLE:

REVIEW SET:

01.17.21

PITTSFIELD VILLAGE COMDOMINIUMS
Structural Alterations to roofs and attics

RAA : 20-018

2220 Pittsfield Blvd, Ann Arbor, Michigan, 48104

RAA : 20-018

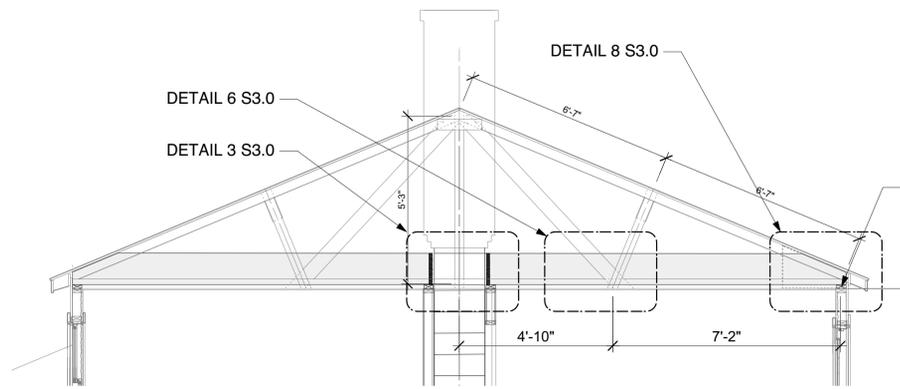
RUETER ASSOCIATES

ARCHITECTS

515 Fifth Street, Ann Arbor, Michigan, 48103

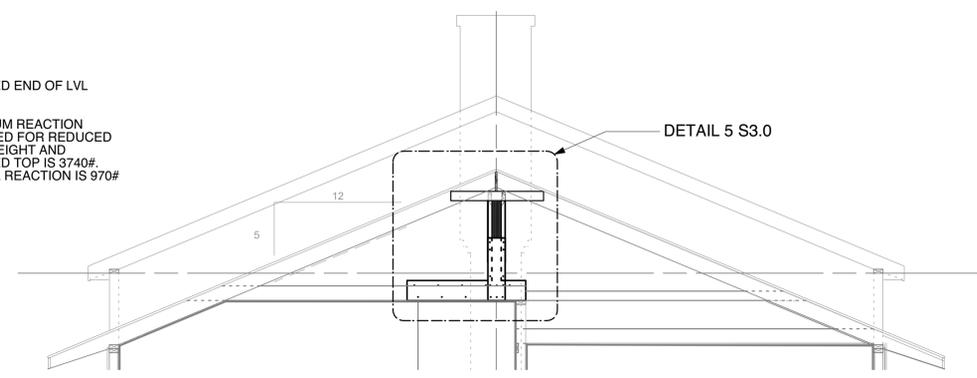
phone: (734) 769-0070, fax: (734) 769-0167

S-2.0



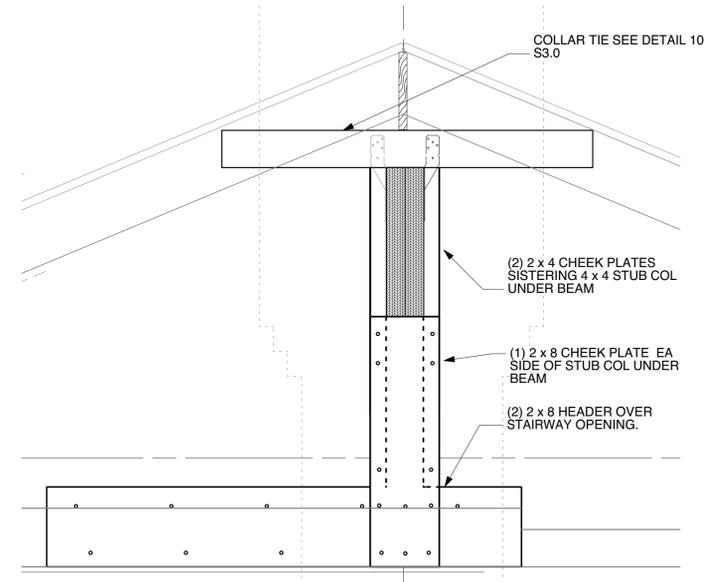
1 BUILDING SECTION AT C1-C1

Scale: 1" = 1'-0" on 24" x 36"
1/2" = 1'-0" on 12" x 36"



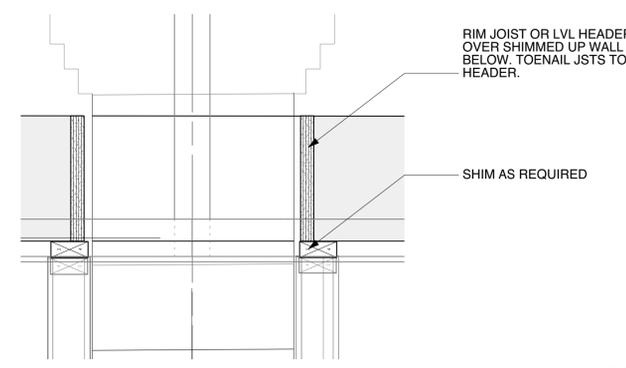
2 BUILDING SECTION A1-A1

Scale: 1" = 1'-0" on 24" x 36"
1/2" = 1'-0" on 12" x 36"



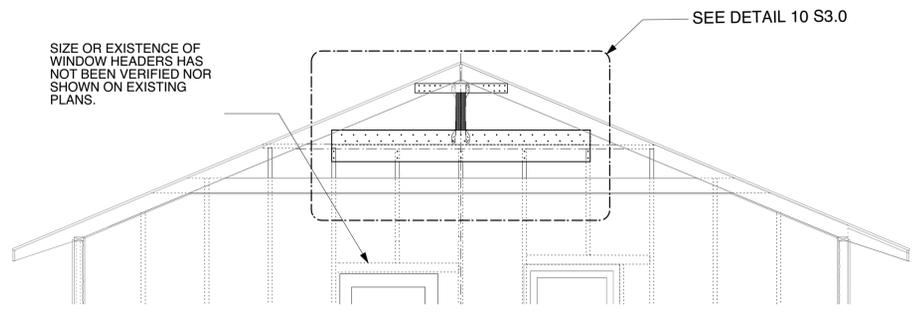
5 DETAIL OF BEAM BEARING AT STAIRWAY

Scale: 1-1/2" = 1'-0" on 24" x 36"
3/4" = 1'-0" on 12" x 36"



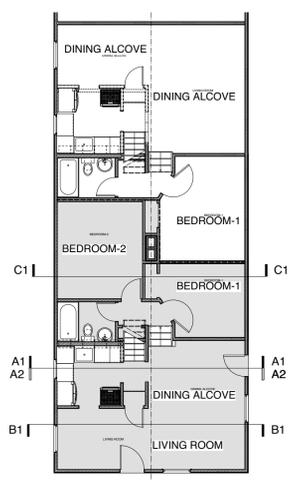
3 DETAIL AT HEADER

Scale: 1-1/2" = 1'-0" on 24" x 36"
3/4" = 1'-0" on 12" x 36"



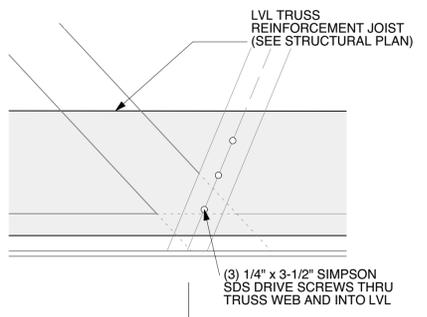
4 BUILDING SECTION B1-B1

Scale: 1" = 1'-0" on 24" x 36"
1/2" = 1'-0" on 12" x 36"



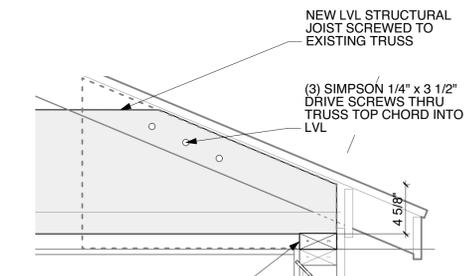
1 REFERENCE PLAN

No Scale



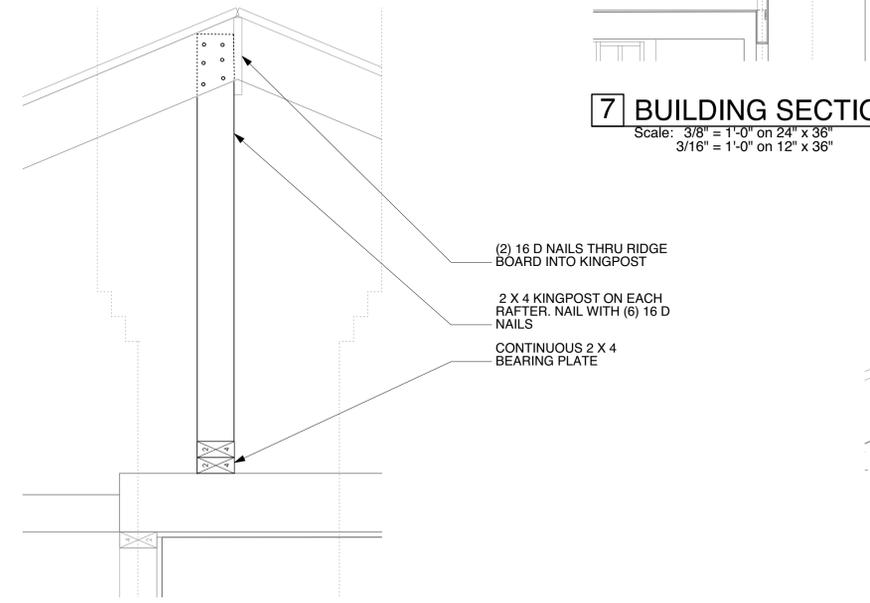
6 DETAIL AT TRUSS BOTTOM CHORD

Scale: 1-1/2" = 1'-0" on 24" x 36"
3/4" = 1'-0" on 12" x 36"



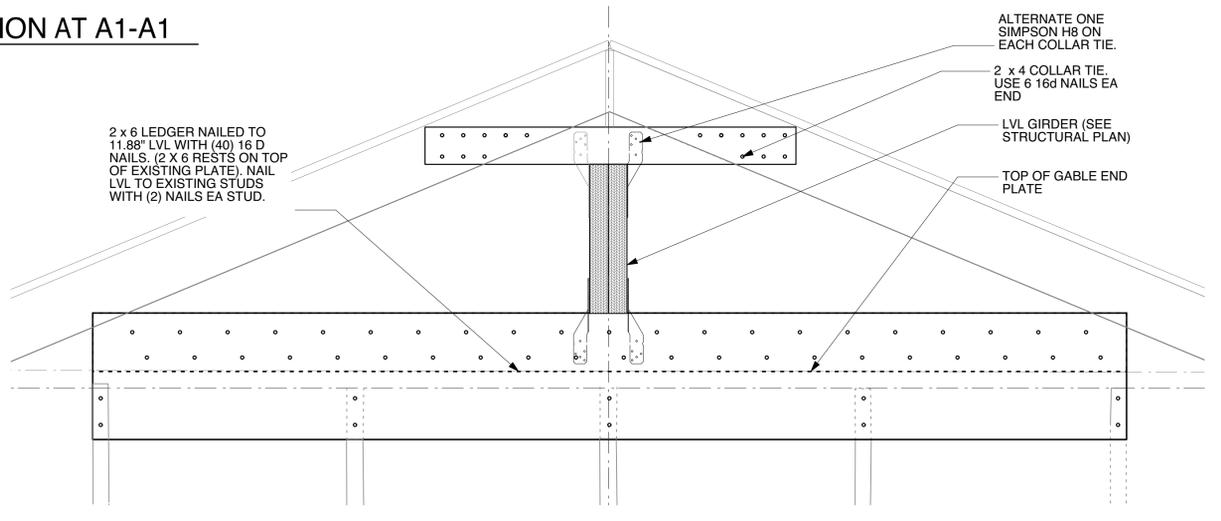
8 DETAIL AT TRUSS HEEL

Scale: 1-1/2" = 1'-0" on 24" x 36"
3/4" = 1'-0" on 12" x 36"



7 BUILDING SECTION AT A1-A1

Scale: 3/8" = 1'-0" on 24" x 36"
3/16" = 1'-0" on 12" x 36"



10 DETAIL AT BEAM BEARING ON OUTSIDE WALL

Scale: 1-1/2" = 1'-0" on 24" x 36"
3/4" = 1'-0" on 12" x 36"

9 BUILDING SECTION AT A1-A1

Scale: 3/8" = 1'-0" on 24" x 36"
3/16" = 1'-0" on 12" x 36"