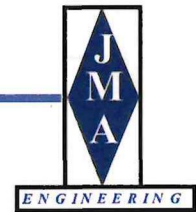


J.M. ALBAIN ENGINEERING, LLC

14 Lincoln Road, Waterford, CT 06385

Phone & Fax: 860-439-1111 Mobile: 860-705-1631

Email: jma724@snet.net



February 5, 2011

Mr. Mark Shenking
Chief of Fire Station
Oswegatchie Fire Station
441 Boston Post Road
Waterford, CT 06385

RE: Update on Structural Shoring for Damaged Roof Section
Ref. Drawings:
JM Albain Engineering, Dwgs S-1 to S-6 dated 10/25/10
Dwgs. S-6, S-7 rev. 1, (DCN #1) dated 01/26/11
Project # JMA10-327-06

Dear Mark,

I visited the site on February 4 for an inspection of the on-going work, and to meet with the foreman for Noble Construction, John, and go over some issues that have came up during the implementation of the shoring. Herein is a summary of our meeting (see new DCN #2, drawings # DC2-1, and DC2-2, dated 2/05/11):

1. All the shoring in the Apparatus Room has been constructed in accordance with our specification and drawings referenced above.
2. Columns P7, P8, & P9 in the Dispatcher Room and surround areas will be supported on existing foundations, eliminating the need to carry them down one more level.
3. The temporary beams supporting the exterior edges of the roof, at both above the Hall Room and Kitchen (second floor, see Sections A, B, & C (Dwgs S-2, S-3 and S-4) will be installed at a lower elevation, with a short double stud (one king and one jack) above it, to make room for the potential installation of the future new ceiling joist.
4. The new temporary roof supporting beams over the first floor Day Room and Kitchen will need to be increased to triple LVL's from double LVL's since we will need to cantilever those beams at each end of the room to avoid additional expensive work on the exiting features in the these rooms.
5. Most of the ceiling has been removed, and the condition of the roof framing exposed so far is considered dismal, especially in the area where the two roofs intersect, and at the flat section of the adjacent roof. We discussed the need for current work to be done very careful in this area to avoid the possibility of any potential partial



collapse that may cause injury to the workers. Once the temporary shoring is installed, this whole area will need to be surveyed completely to determine the actual framing condition for the future repair.

6. We looked at the roof area right above the Kitchen at the second floor, and some column relocation may be required, as we are trying to minimize the work around the ceiling over the Kitchen.

The new changes proposed on this report are done for the purpose to minimize the amount of disruption on existing features, and to ease the installation of the future roof reinforcement framing. As more area becomes accessible we expect additional adjustment to the design drawings.

If you have any questions or desire further information regarding this update report, please contact me at your convenience.

Respectfully submitted,

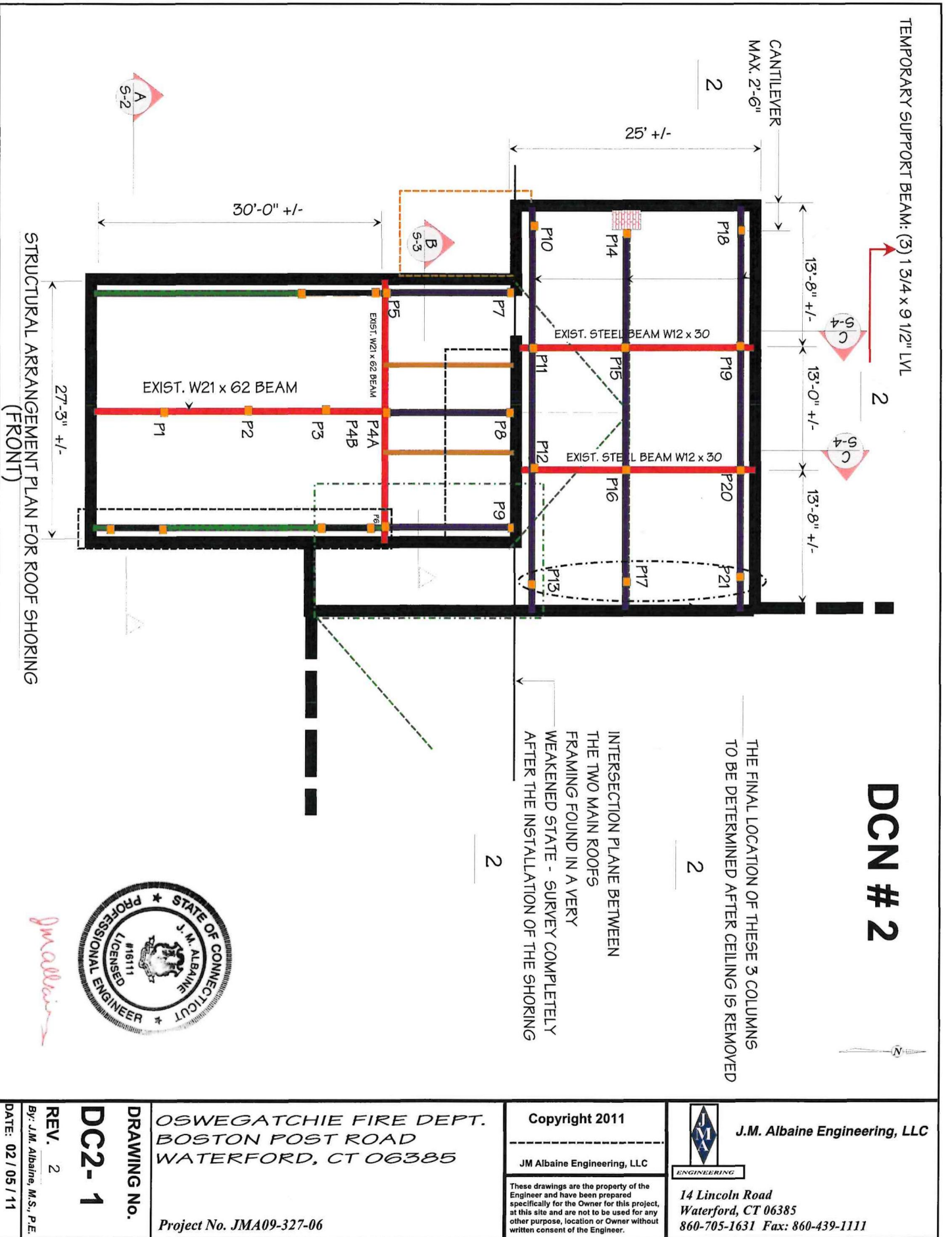
Jose-Miguel Albaine, M.S., P.E.
Structural Engineer



cc. Robert Avena
Frank Hoagland
Steve Cardelle
Rocco Bracciaelli
Ed Noble

TEMPORARY SUPPORT BEAM: (3) 1 3/4 x 9 1/2" LVL

DCN # 2



J.M. Albaine

DRAWING No. **DC2-1**
 REV. 2
 By: J.M. Albaine, M.S., P.E.
 DATE: 02 / 05 / 11

OSWEGATCHIE FIRE DEPT.
 BOSTON POST ROAD
 WATERFORD, CT 06385

Project No. JMA09-327-06

Copyright 2011

JM Albaine Engineering, LLC

These drawings are the property of the Engineer and have been prepared specifically for the Owner for this project, at this site and are not to be used for any other purpose, location or Owner without written consent of the Engineer.

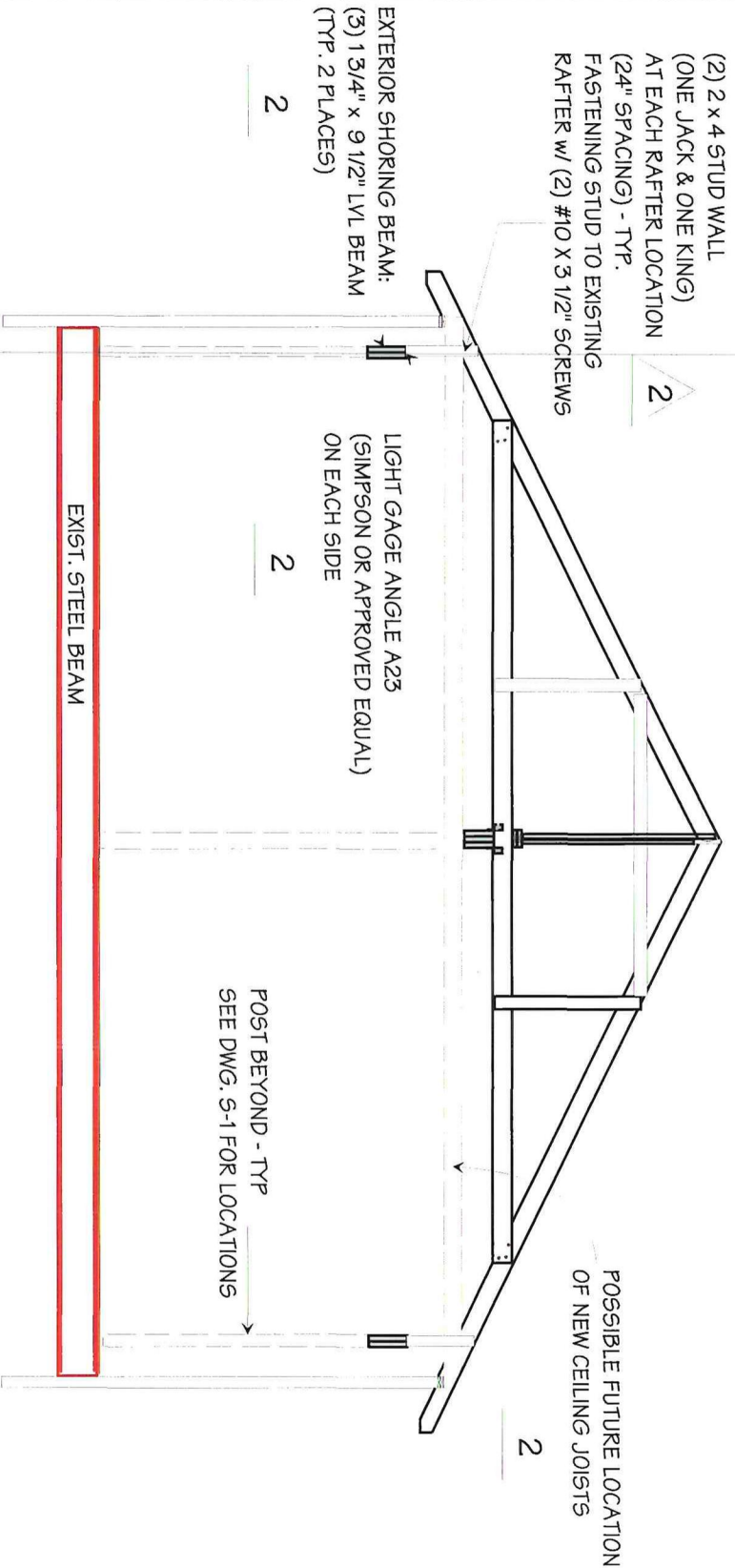


J.M. Albaine Engineering, LLC

14 Lincoln Road
 Waterford, CT 06385

860-705-1631 Fax: 860-439-1111

DCN # 2



THIS SECTION IS APPLICABLE FOR SECTIONS A, B, & C

NOTE:

FOR SECTIONS A & B (DWGS. S-2 & S-3), THE EXTERIOR BEAMS
ARE: (2) 1 3/4 x 9 1/2 LVL

FOR SECTION C (DWG. S-4) ALL THE BEAMS ARE (3) 1 3/4 x 9 1/2" LVL



JM Albaine

REV. 2
By: J.M. Albaine, M.S., P.E.
DATE: 02 / 05 / 11

DRAWING No.
DC2-2

OSWEGATCHIE FIRE DEPT.
BOSTON POST ROAD
WATERFORD, CT 06385

Project No. JMA09-327-06

Copyright 2011

JM Albaine Engineering, LLC

These drawings are the property of the
Engineer and have been prepared
specifically for the Owner for this project,
at this site and are not to be used for any
other purpose, location or Owner without
written consent of the Engineer.

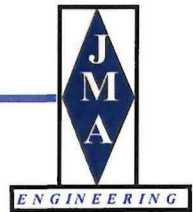


J.M. Albaine Engineering, LLC

14 Lincoln Road
Waterford, CT 06385
860-705-1631 Fax: 860-439-1111

J.M. ALBAINE ENGINEERING, LLC
14 Lincoln Road, Waterford, CT 06385

Phone & Fax: 860-439-1111 Mobile: 860-705-1631
Email: jma724@snet.net



March 6, 2011

Mr. Mark Shenking
Chief of Fire Station
Oswegatchie Fire Station
441 Boston Post Road
Waterford, CT 06385

RE: Structural Shoring for Damaged Roof Section
Ref. Drawings:
JM Albaine Engineering, Dwgs S-1 to S-6 dated 10/25/10
As-built Dwgs. S-1 to S-8, dated March 5, 2011 Rev. 2
Project # JMA10-327-06

Dear Mark,

On February 26 and March 5, 2011, I conducted the final inspection of the installed shoring frame work. I have attached the revised As-built drawings (S1 to S-8) showing the final shoring installation.

We also observed that the exterior North wall has a bow (outward displacement at the top of wall) of approximately 3", with the East and West exhibiting bow in the order of 2" or more. Here are a couple of options deemed to provide a practical repair in term of construction, economics, and long term performance.

OPTION "A"

Reinforce existing roof in place as shown on Dwg. S-5. This option will not remove the current deflection (sag) on the ridge, but it will provide a strong roof capable of resisting the current building code load requirement. The "roof sag" will not be noticeable from the inside as the new inside ceiling finish will be plumb and straight.

Note that this is a conceptual design and that more analysis is required to develop the final design reinforcement to fit the existing condition.

OPTION "B"

Remove the entire roof frame from both affected buildings, and provide temporary support in the areas where adjacent roof abut the affected roof.

Under this option two paths may be followed:



1. Rebuilt a new roof framework using conventional "stick framing" and/or engineering lumber where required, and adjusting the configuration to conform to the bowed exterior supporting walls.
2. Installed a new system of prefabricated metal connected wood trusses, in which case we'll recommend that all the exterior walls be replaced with new 2 x 6 walls.

In all cases, we recommend that the upper exterior wall be either reinforced (Option A & Option B, case 1), or completely replaced (Option B, case 2), since the structural integrity of these walls have been seriously compromised by the large thrust (lateral) forces from the roof framing vertical downward displacement.

For the two lower bearing exterior walls (East & West walls) housing the Apparatus Room, we recommend that there walls be repaired and reinforced as well, since the sill plates at the floor level shows advanced degree of deterioration.

Please note that the installed temporary shoring served the function of stabilizing the roof to prevent a sudden roof collapse. The shoring are designed to provide a safe working area/platform during the projected work to repair or replace the roof; this framework has been designed for temporary application as other elements such as the exterior walls are subject to local or global failure (such as from high wind pressure or suction induced by hurricane forces).

We will work with Noble Construction to develop an estimate of the construction cost for the options described in this report. We strongly recommend that work proceeds expediently since the installed shoring are only designed for temporary application.

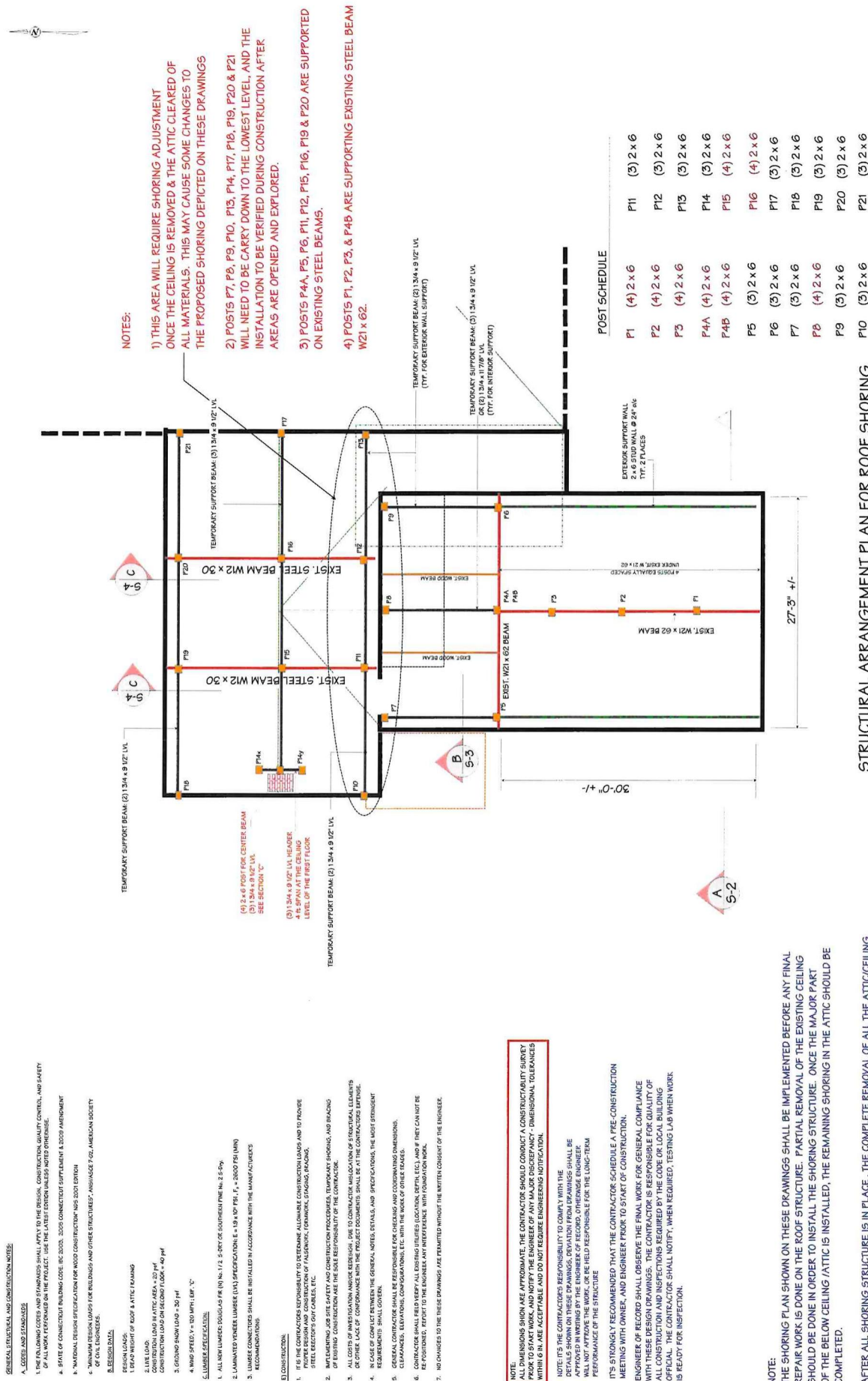
If you have any questions or desire further information regarding this report, please contact me at your convenience.

Respectfully submitted,

Jose-Miguel Albaine, M.S., P.E.
Structural Engineer



cc. Robert Avena
Frank Hoagland
Steve Cardelle
Rocco Braciaelli
Ed Noble



STRUCTURAL ARRANGEMENT PLAN FOR ROOF SHORING
(FRONT)

NOTE: ALL DIMENSIONS SHOWN ARE APPROXIMATE

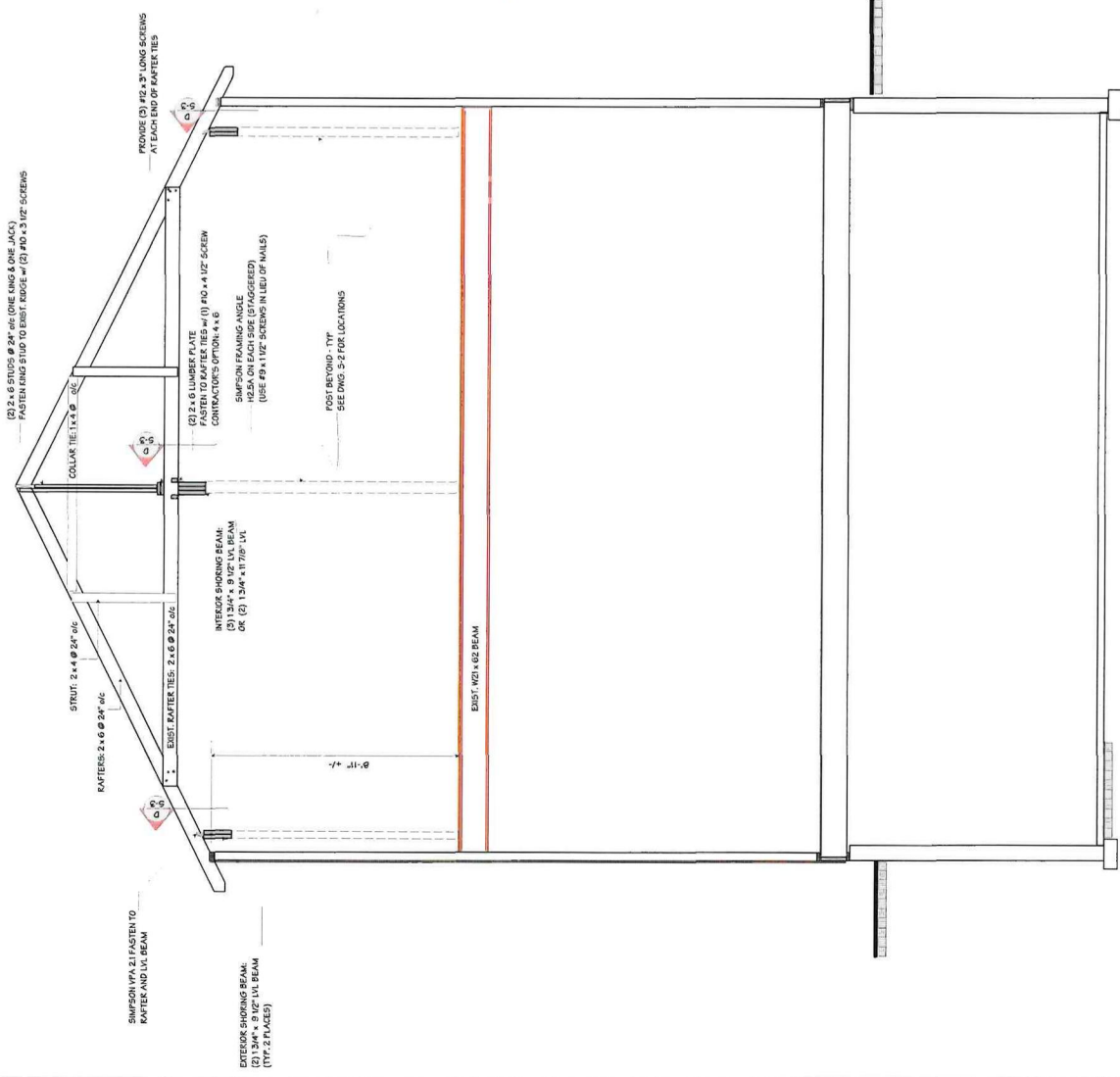
NOTE: THE SHORING PLAN SHOWN ON THESE DRAWINGS SHALL BE IMPLEMENTED BEFORE ANY FINAL REPAIR WORK IS DONE ON THE ROOF STRUCTURE. PARTIAL REMOVAL OF THE EXISTING CEILING SHOULD BE DONE IN ORDER TO INSTALL THE SHORING STRUCTURE. ONCE THE MAJOR PART OF THE BELOW CEILING /ATTIC IS INSTALLED, THE REMAINING SHORING IN THE ATTIC SHOULD BE COMPLETED.

AFTER ALL SHORING STRUCTURE IS IN PLACE , THE COMPLETE REMOVAL OF ALL THE ATTIC/CEILING, INSULATION, AND OTHER ITEMS NOT REQUIRED FOR THE BUILDING FUTURE PERFORMANCE SHOULD BE CAREFULLY REMOVED IN ORDER TO COMPLETE A FULL ASSESSMENT OF THE FINAL REPAIR /REINFORCEMENT FOR THE EXISTING ROOF STRUCTURE.

90-126-01VINC '9N 12250



SEE DWG. 5-8 FOR REVISION
IN THIS AREA



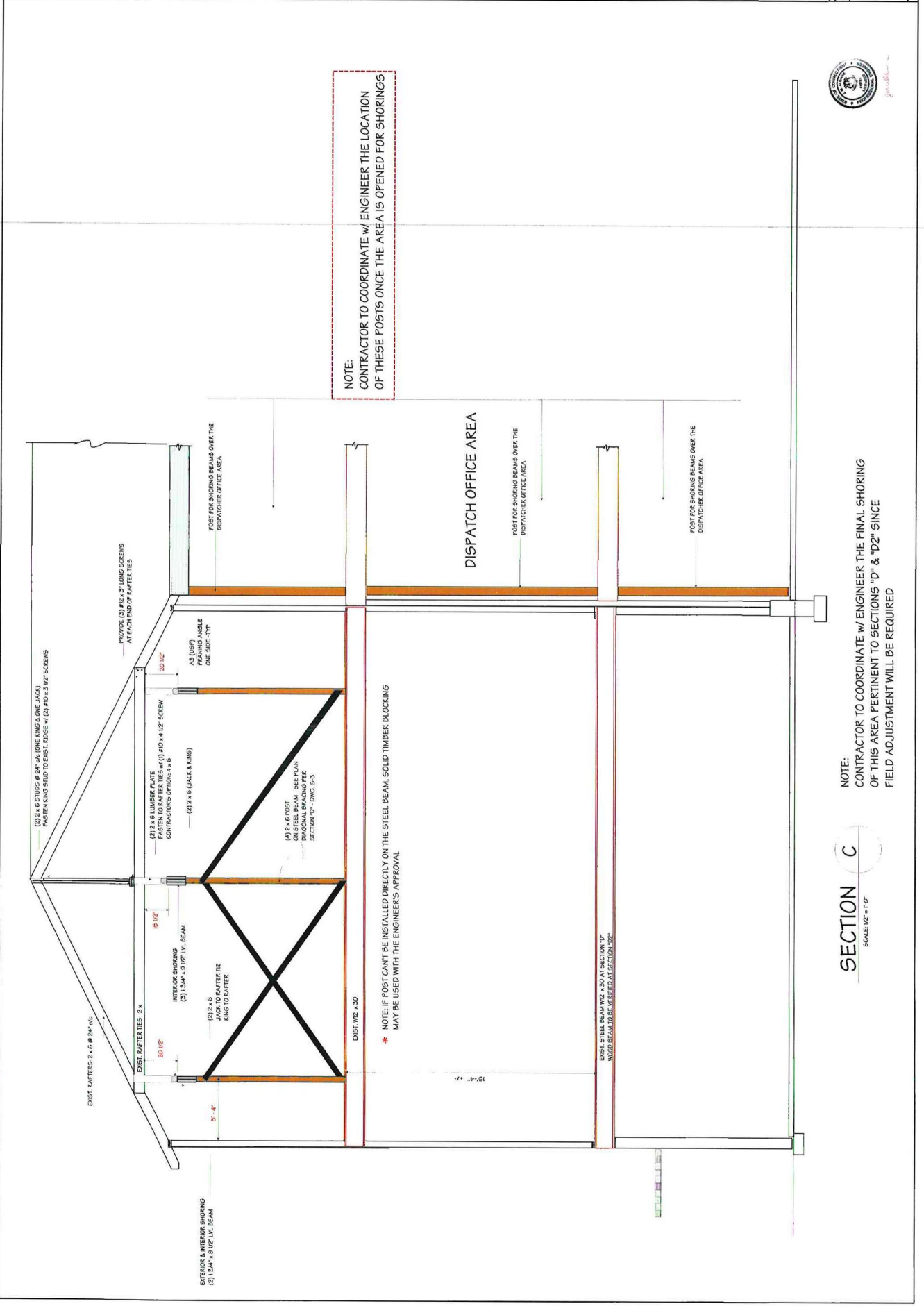
SECTION D
SCALE: 1/2" = 1'-0"

ELEVATION VIEW OF SHORING AT SECOND FLOOR

* NOTE: IF POST CAN'T BE INSTALLED DIRECTLY ON THE STEEL BEAM, SOLID TIMBER BLOCKING MAY BE USED WITH THE ENGINEER'S APPROVAL

SECTION B
SCALE: 1/2" = 1'-0"



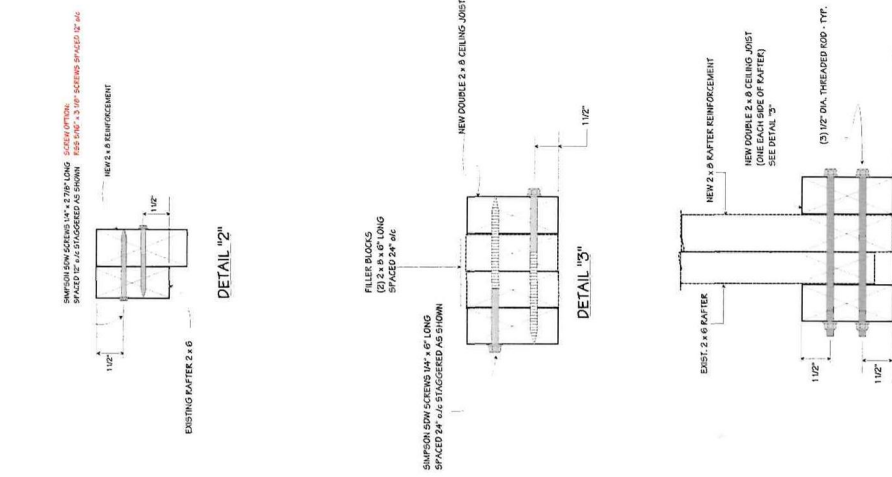


SECTION C

SCALE: 1/2" = 1'-0"



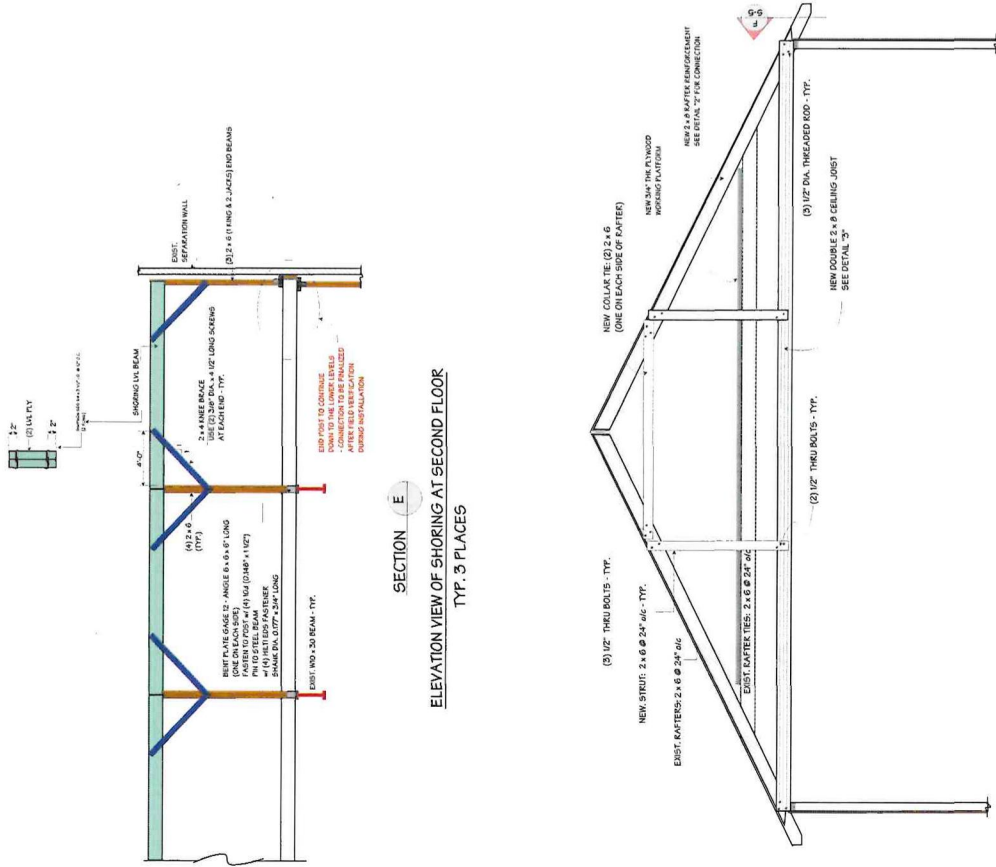
SECTION F



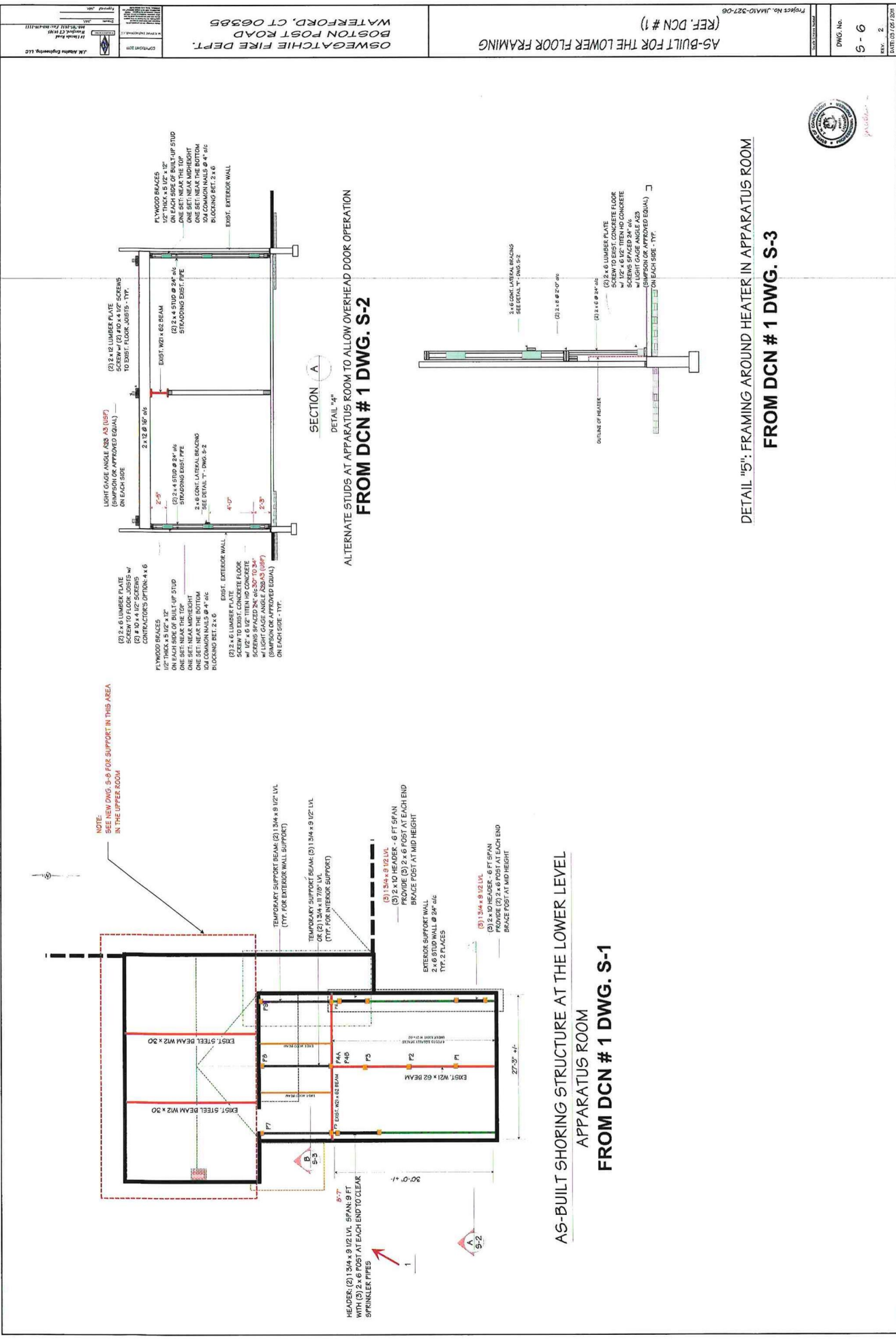
SECTION E

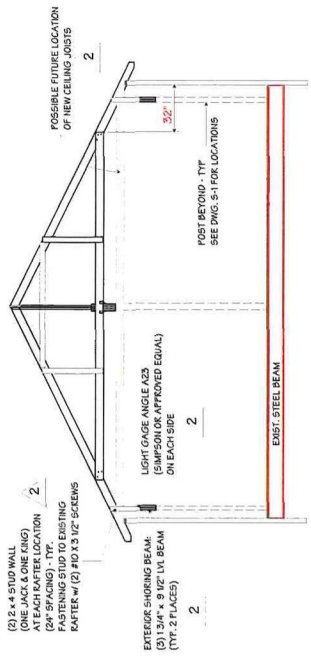
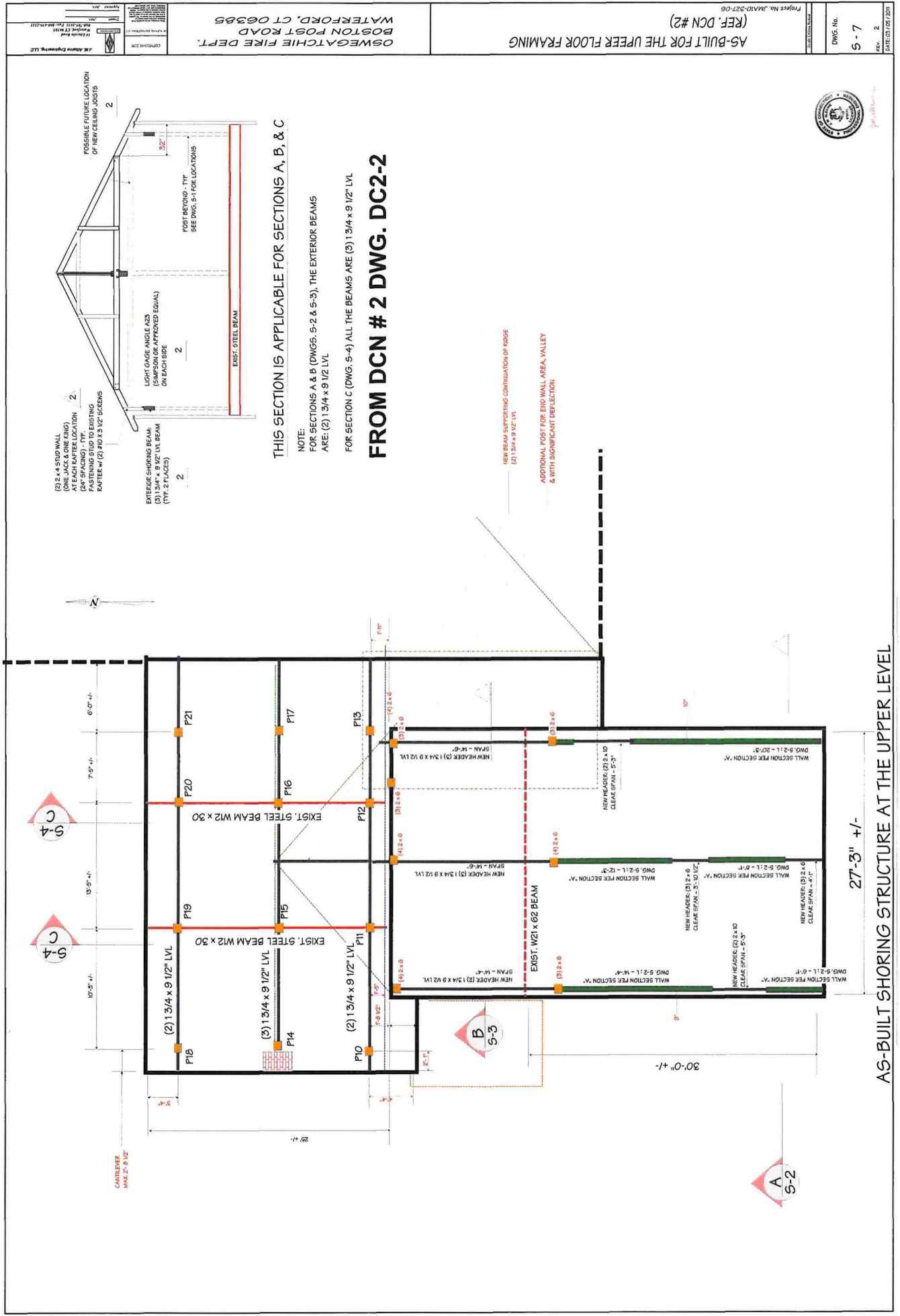
ELEVATION VIEW OF SHORING AT SECOND FLOOR

TYP. 3 PLACES



CONCEPTUAL DESIGN FOR ROOF REINFORCEMENT
(FOR PRELIMINARY CONSTRUCTION ESTIMATE COST)





THIS SECTION IS APPLICABLE FOR SECTIONS A, B, & C

NOTE:
 FOR SECTIONS A & B (DWGS. S-2 & S-3), THE EXTERIOR BEAMS ARE: (2) 1 3/4 x 9 1/2\"/>

FOR SECTION C (DWG. S-4) ALL THE BEAMS ARE (3) 1 3/4 x 9 1/2\"/>

FROM DCN # 2 DWG. DC2-2

NEW BEAM SUPPORTING CONTINUATION OF RIDGE
 (2) 1 3/4 x 9 1/2\"/>

ADDITIONAL POST FOR END WALL AREA, VALLEY & WITH SIGNIFICANT DEFLECTION



DWG. No.	S-7
REV.	2

AS-BUILT FOR THE UPPER FLOOR FRAMING
 (REF. DCN #2)

OSWEGATCHIE FIRE DEPT.
 BOSTON POST ROAD
 WATERFORD, CT 06385

Project No. JMW-227-06

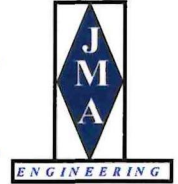
DATE: 02/2/2021

Scale: 1/8\"/>

J.M. ALBAINE ENGINEERING, LLC

14 Lincoln Road, Waterford, CT 06385 Email: jma724@snet.net

www.JMAlbaineEng.com



Oswegatchie Fire Station
441 Boston Post Road, Waterford CT

Temporary Framing Inspection
REPORT #1 --- October 31, 2022

Att. Michael Howley
Director of Fire Services
Public Safety Building
204 Boston Post Road
Waterford, CT 06385

Subject: Oswegatchie Fire Station
Inspection /Assessment: Building Structural Safety
Project # JMA22-327-062

The following report objective is to provide an update of the current structural condition of the overall building shoring as designed and constructed per our recommendations. I met with Rocco Bracciale at the premises for an inspection / walk through conducted on October 1st, 2022.

Reference Documents

- 1) Report / Letter dated March 6th, 2011 by JM Albaine Engineering - Project # JMA10-327-06.
- 2) Report / Letter dated February 5, 2011 by JM Albaine Engineering - Project # JMA10-327-06
- 3) Design /As-Built Drawings By JM Albaine Engineering S-1 to S-7, Revision 2, dated March 05, 2011.

Executive Summary:

The installed temporary shoring on the original building under scope, built in 1928, is in good condition and no significant sign of distress or deficiency was observed nor detected that may indicate a concern regarding the safety of the building in the current condition as supported by the shoring. The shoring is holding up the damaged main roof over the Apparatus Room, Day Room, Hall Room, and Kitchen, all located in the older building, the subject of the shoring.

Moreover, the intersecting roof framing between the 1928 structure and the flat roof from the 1985 structure is a critical area where lots of damage on the roof rafters have been observed due to the flat roof bearing on the older 1928 roof.

However, it is also our opinion that the temporary shoring is not a substitute for the overall building stability as stated in Reference 1 above and quoted below:

"Please note that the installed temporary shoring served the function of stabilizing the roof to prevent a sudden roof collapse. The shoring are designed to provide a safe working area/platform during the projected work to repair or replace the roof; this framework has been designed for temporary application as other elements such as the exterior walls are subject to local or global failure (such as from high wind pressure or suction induced by hurricane forces)."

It is factual that since the installation of the shoring, the building has been subject to two major hurricane forces, Irene in August 2011 and Sandy in October 2012. These hurricanes had wind velocity of 66 mph & 80 mph respectively, and the building withstood these forces with no major consequences.

The deficient roof framing is being supported by the shoring, however it is subject to deterioration if water intrusion is present which will further weaken such framing. It is imperative to keep the existing roof framing in a dry condition.

Furthermore, the current Connecticut Building Code (2022) requires building to be designed for a wind velocity of 108 mph in Waterford, which translates to building forces increment of 82% above those from Hurricane Sandy, therefore presenting a high risk of building damage and stability in the case that such storm may come through our area.

Conclusion:

The shoring installed in 2011 are providing the required support as originally intended, mainly reinforced the weakened roof framing over the Apparatus Room, Dispatcher Room, Day Room, Hall Room, and the kitchen. These shoring were installed principally because of the dismal condition of the roof framing (see Ref. #2).

The shoring was found in good conditions with negligible movement changes since they were installed, thus ensuring the safe function of those areas under potential heavy snowstorms.

However, the existing roof framing was stabilized by providing vertical supports at the peak (ridge) down to solid structure and reinforcing the existing rafter tie connections to the existing rafters (refer to Reference 3, Section "A", Dwg S-2 and Section "B" Dwg. S-3). The existing rafters (2 x 6 @ 24" on-center) were not reinforced at the time due to the nature of the work (temporary), and they remain the weakest link in the chain as water intrusion from the roof will further deterioration on such elements of the roof framing.

Regarding the building lateral stability caused by hurricane induced lateral forces and to a lesser degree seismic forces, the area of the building under consideration is vulnerable as reported previously due to the weakened state of the exterior walls specially in the Apparatus Room as previously reported.

Although the building has withstood two significant hurricane events in the last 12 years, there still exist a significant risk of building overall stability if a significant hurricane passes through the areas because of the condition of the exterior bearing wall (shear walls) and the existing roof rafters that were not reinforced at the time of the installation of the shoring.

I trust this information is adequate for your needs. If you have any questions or desire further information regarding this report, please contact me at your convenience.

Respectfully submitted,



Jose-Miguel Albaine, M.S., P.E.
Consulting Design-Structural Engineer



