BRY-CO
ENGINEERING LTD.

December 19, 2018

Project No: 18-67

LORING & DISTRICT LOCAL SERVICE BOARD
P.O. Box 156
Port Loring, ON, P0H 1Y0

Attention: Mr. Larry Bain and Service Board Members

Reference: Argyle Community Centre

Location: 10812 Hwy 522, Arnstein, ON

Subject: Final Report Roof Structure Evaluation

Mr. Bain and Service Board Members,

This report is provided as supplemental follow-up to our preliminary report dated November 30th, 2018.

As requested by Mr. Bain, our William J. Bryant, P.Eng. and Elisha Sloan-Keats, P.Eng. attended to the Argyle Community Centre on November 29, 2018 to carry out a visual review of the roof structure of the building. Mr. Larry Bain and Mr. Gilbert Moore were also present on site during the review.

THE BUILDING:

The one storey building is situated on the north side of highway 522. (See Picture 1). We were informed that it was originally a 'T'-shaped school building with the top of the 'T' on the east side (running north-south). A major renovation was done by local community members approximately 25 years ago, when additions were added to the northwest and southwest corners resulting in the current square footprint. The renovations also included the installation of a main north south plywood box beam girder, an east west plywood box beam, and a new hip roof that was built over the entire structure. (See Pictures 2 & 3).

SUPPLIED INFORMATION:

We were informed that the community centre had been closed to the public due to structural concerns expressed in a report from another engineering company that had been hired by a mechanical systems contractor. We were provided a copy of the report after our inspection.

We were informed that no changes to the structure had been observed by the community members who had been maintaining the building.

A temporary shoring post was installed according to the recommendations included in our preliminary report.

SITE INVESTIGATION:

Our site investigation included the examination of accessible exterior and interior areas of the structure including the attic.

The 4' tall plywood box beams appeared to be of sound construction including 2"x6" SPF#1-2 studs at 16" o.c., two layers of 1/2" plywood on each side, and threaded rod fastened from top to bottom plate at approximately 3' intervals. No signs of distress or distortion were observed.

There were no visible signs of recent movement at the joint between the secondary and primary box beams although the plywood had not been cut straight on the bottom edges. We were not able to determine how these two members had been fastened to each other.

At first glance, the underside of the main beam did appear to have some sagging. Upon closer investigation, it appeared that it was the poorly installed finishes rather than the shape of the beam that was askew. (See Picture 4).

The roof rafters appeared to be of sound construction and we noted no significant visual evidence of structural distress during our review. Specifically, we did not observe any longitudinal cracks in the rafters. We did note that the underside of the ceiling joists sagged slightly. This was not outside the natural sag that wood often exhibits over time when spanning from bearing point to bearing point. There was also no evidence that the original ceiling tiles had been displaced from their original positions indicating that the sagging would have already been in place several years ago when the ceiling tiles had been installed. It is our opinion that the sagging has not continued even though the upper roof rafters are provided with intermediate support bearing on the original roof rafters.

RECOMMENDATIONS:

The installation of a temporary shoring post or beam hanger should be installed before reopening the building to the public.

In order to remove the temporary shoring post, which obstructs the main gathering space, a beam hanger could be installed as per the attached drawings SK-1 to SK-3. This will ensure that the east west plywood box beam is properly structurally fastened to the north south plywood box beam girder. The temporary shoring post should only be removed after the beam hanger is installed.

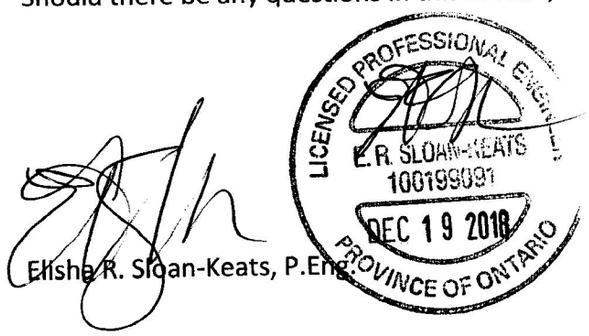
Regular semi-annual inspections of the condition of the roof rafters, box beams, ceiling tiles and finishes should be added to the building's preventive maintenance plan. Any changes to the condition of these elements should be investigated further by a structural engineer.

CONCLUSION:

The major concerns outlined in the previous engineering report were the structural capacity of the two plywood box beams and the condition of the original roof joists that are now ceiling joists. Plywood box beams are not an uncommon method of beam construction with adequate shear and moment capacities for this type of application. Our opinion is that the building, with the temporary shoring post or new beam hanger installed, is structurally sound. This opinion is based on the history of the building and the visual evidence of the lack of structural distress indicators.

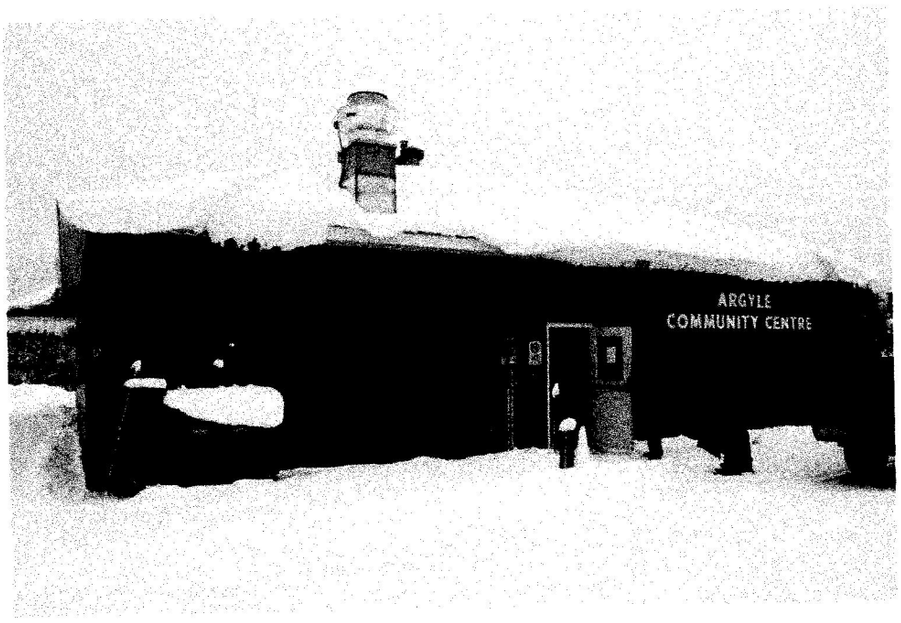
Our opinions are based on the information made available to us and on our visual investigation. The visual investigation performed could not include the inaccessible area of the unit's structure or its foundation system. We request that, should any new information pertaining to this matter become available, we be advised immediately in order that this new information can be evaluated in conjunction with the above commentary in the event that our present opinion may be affected.

Should there be any questions in this matter, we will remain available.



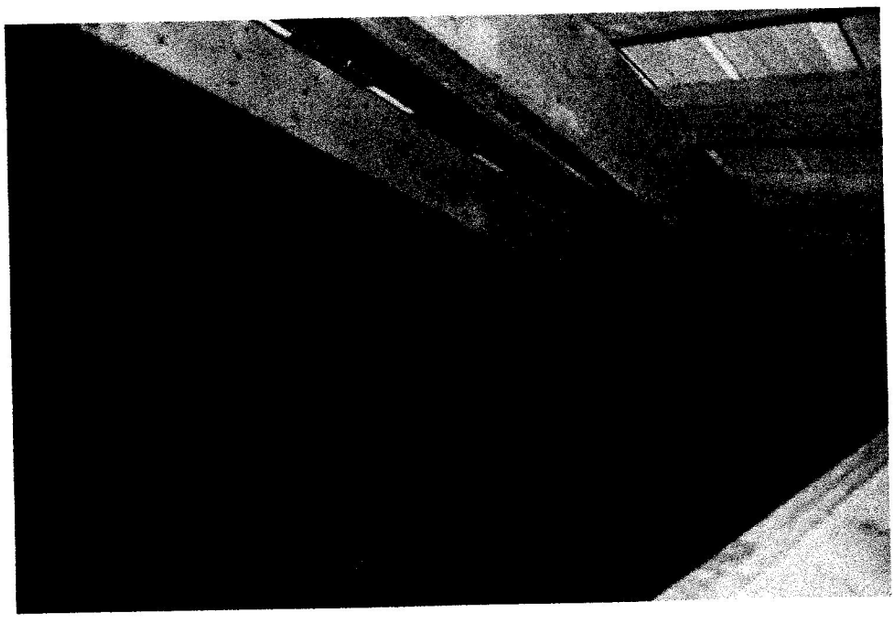
Elisha R. Sloan-Keats, P.Eng.

Attachment: Picture Catalogue

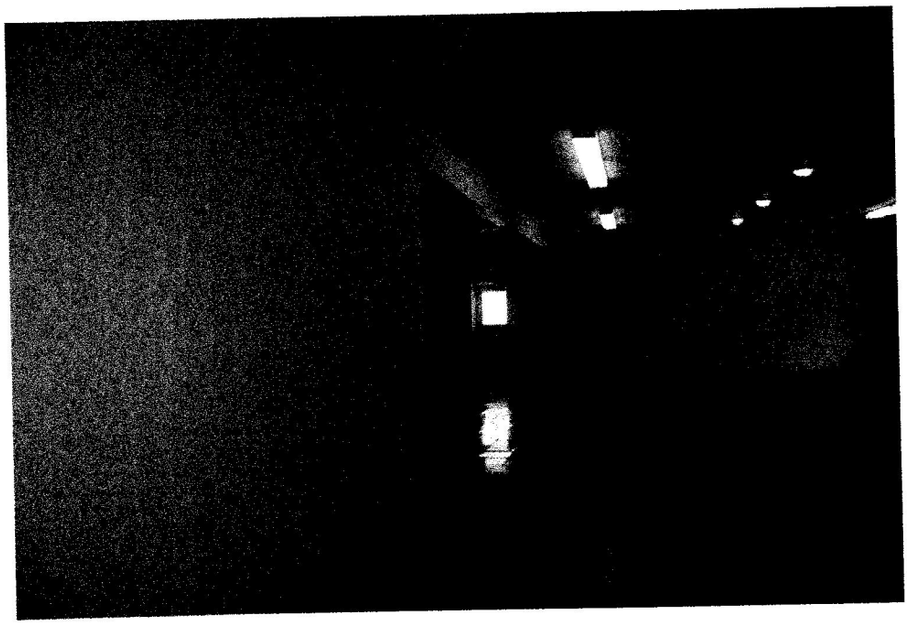


1	South Elevation, Facing Highway 522

2	East West Plywood Box Beam (Left) and Main North South Plywood Box Beam Girder (Right)

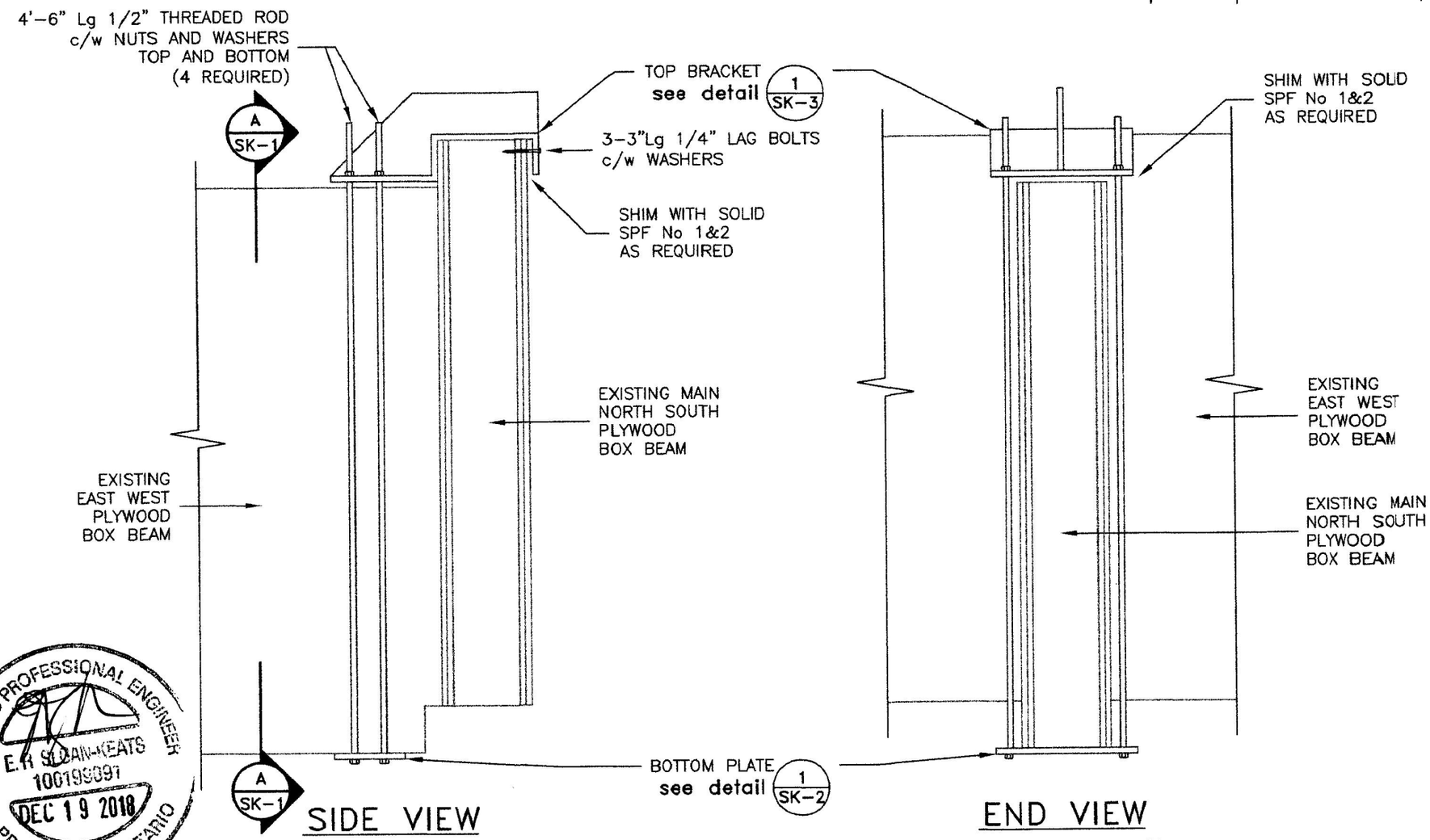


3	Rafters and Knee Walls



4	Finished Underside of Main North South Beam

DATE	REVISION	No.



LICENSED PROFESSIONAL ENGINEER
E.R SLOAN-KEATS
100193097
DEC 19 2018
PROVINCE OF ONTARIO

BEAM HANGER (INSTALLED)

Scale: 1"=1'-0"

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POWASSAN, ONTARIO

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ARGYLE COMMUNITY CENTRE
10812 Hwy 522, Arnstein, ON

DWG. No.	PROJ. No.	DWG. BY	DATE
SK-1	18-67	E.S.K.	NOV/18
SCALE	FILE No.	CHK. BY	PLOT DATE
AS NOTED	18-67ALL	W.J.B.	DEC19/18

DATE	REVISION	No.

NOTES:

1) VERIFY ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORKS AND REPORT ANY DISCREPANCIES TO THE ENGINEER.

2) FABRICATION TO COMPLY WITH REQUIREMENTS OF CSA STANDARD CAN3-S16.1-LATEST EDITION. THE STEEL FABRICATOR IS TO BE CERTIFIED UNDER W47.1-LATEST EDITION. WELDING IS TO CONFORM TO CSA W59-LATEST EDITION.

3) HOT ROLLED STRUCTURAL SECTIONS - GRADE 350W MINIMUM, TO CAN/CSA-G40.20/G40.21-LATEST EDITION.

4) WELDING MATERIALS - WELDING RODS ARE TO BE E49XX OR AN EQUIVALENT OR BETTER.

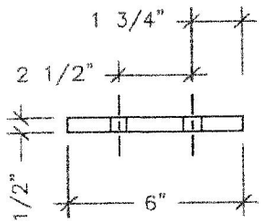
5) FIT JOINTS AND INTERSECTING MEMBERS ACCURATELY. MAKE WORK IN TRUE PLANES WITH ADEQUATE FASTENING

6) SURFACES OF EXISTING MATERIAL THAT ARE TO RECEIVE WELDS ARE TO BE CLEANED THOROUGHLY OF ALL FOREIGN MATTER, INCLUDING PAINT FILM, IN THE AREA AT LEAST 2 INCHES ON ALL SIDES IMMEDIATELY ADJACENT TO THE WELD.

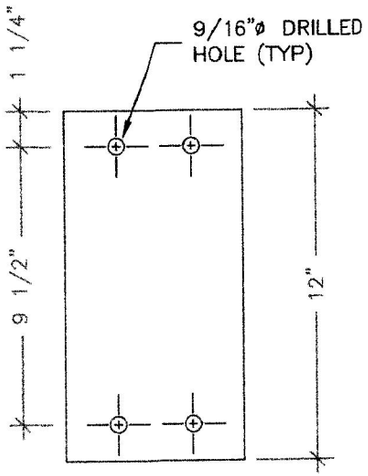
7) CLEAN ALL STEEL WORK IN PREPARATION OF STEEL FOR PAINTING, TO CAN/CSA S16.1-LATEST EDITION.

8) PRIMER TO BE APPLIED TO ALL SURFACES AFTER WELD IS COMPLETED.

9)) PRIMER PAINT TO BE OIL ALKYD TYPE CONFORMING TO C.G.S.B.1-GP-40. PAINT TO CONFORM TO CISC/CPMA 1-73A ZINC RICH CORROSION RESISTANT AND RED IN COLOUR TO MATCH EXISTING COLOUR. WORK PAINT WELL INTO ALL JOINTS, CREVICES, INTERSTICES AND OPEN SPACES.



SIDE VIEW

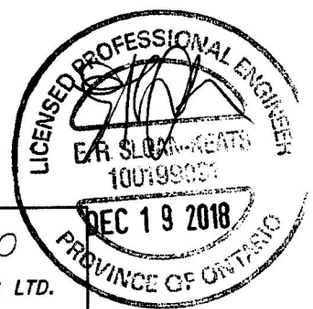


TOP VIEW

BOTTOM PLATE DETAIL (1 / SK-2)

BEAM HANGER DETAILS

Scale: 1 1/8"=1'-0"



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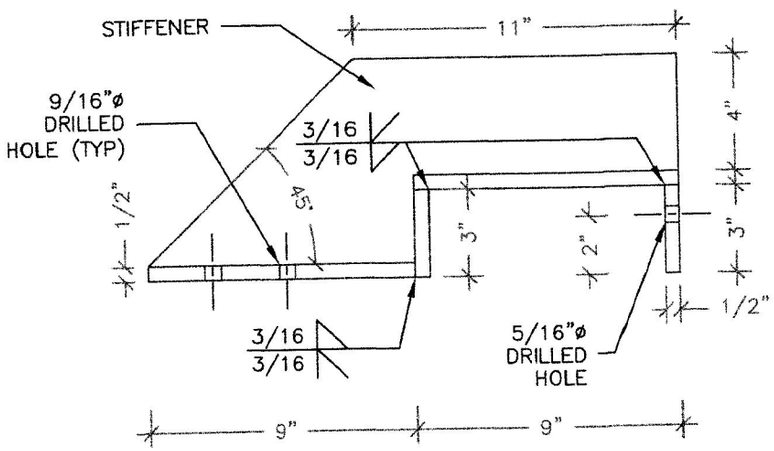
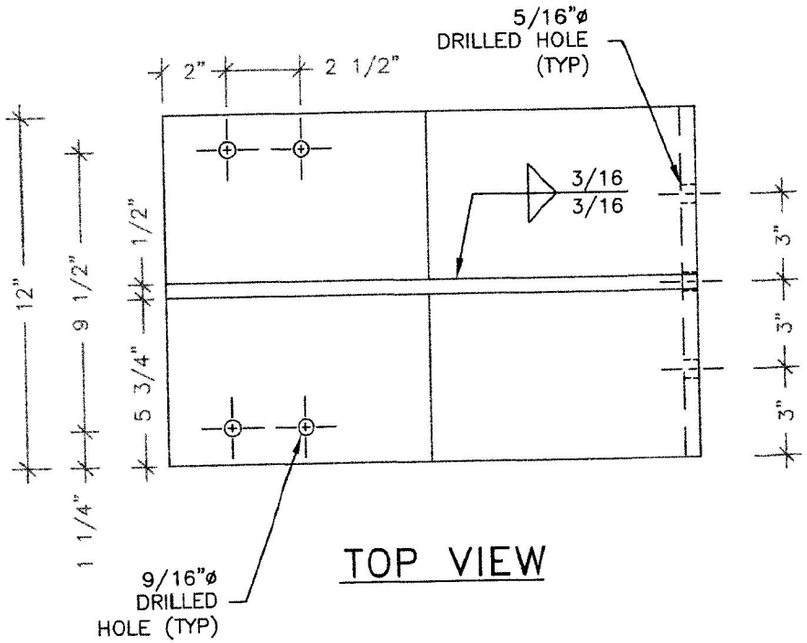


SIDE VIEW



TOP VIEW

TOP BRACKET DETAIL (1 / SK-3)

LICENSED PROFESSIONAL ENGINEER
E.R. SLOAN-KEETS
10019999
DEC 19 2018
PROVINCE OF ONTARIO

BEAM HANGER DETAILS

Scale: 1 1/8"=1'-0"

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