

Review 8 Barron Drive Bracebridge, Ontario P1L 0H3

Appendix A - 2025 Tatham Engineering

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File 224503-05

January 20, 2025

Fred Schmeltz Operation and Facilities Manager Municipality of Powassan 250 Clark St. Powassan, Ontario P0H 1Z0 fschmeltz@powassan.net

Re: Trout Creek Community Centre, 181 Main St. W, Trout Creek Detailed Structural Investigation

Dear Fred:

Based on the recommendations of our 2024 Building Assessment (refer to 2024 Powassan Building Assessments - Trout Creek Community Centre by Tatham Engineering dated June 20, 2024), we have conducted a follow-up detailed structural investigation and localized analysis at the Trout Creek Community Centre.

Based on the recommendations of our 2024 Assessment, the detailed investigation focused on the following items:

- 1. Condition of interior wood columns around the rink area and retrofit bolted bearing plates (observation number 3.1.1 in 2024 report).
- 2. Condition of exterior wood columns around the rink area (observation number 3.1.1 in 2024 report).
- 3. Code compliance of previously installed structural modifications. (observation number 3.1.2 in 2024 report).

We visited the Trout Creek Community Centre on September 10, 2024 to collect detailed measurements of the structure supporting the roof at the rink area, and coordinated excavation (completed by Town staff) to conduct a visual review of the below-grade conditions at a representative interior and exterior columns on September 19, 2024. We also collected visual documentation (i.e. photographs) at areas of concern for direct comparison with the two previous assessment reports (by TSH Engineers, Architect, Planners in 2007 and by Tulloch Engineering in 2020) as this background not made available to us until after our site visit during the 2024 assessment.

The observations and comments provided are limited to the portions of the structure that were visible and accessible at the time of our investigations (i.e. footings that were excavated). Reasonable efforts were made to select columns that were accessible yet indicative of the conditions of the remaining columns.



FINDINGS

In the 2024 assessment, our visual observations indicated possible deterioration or insufficient support for the roof over the rink area. Visual indicators included cracking of the slab-on-grade, differential settlement surrounding the wood columns, visible sag in the roofline (also indicated in 2007 and 2020 reports), and the presence of retrofit bolted bearing plates at each of the interior columns.

We coordinated excavation around a representative interior column (at the northwest exit from the rink building) and a representative exterior column (near the southeast exit from the rink building) to determine the below-grade conditions of the structure. We retained a Geotechnical Engineer (Soil Engineers Ltd.) to attend the site during the excavation to provide insight on the soil conditions at the building foundations. The geotechnical report is appended here for reference.

We accessed a representative area of the roof framing by removing a small area of the reflective ceiling barrier at the south end of the rink and confirmed on site the roof framing over the arena consists of wood-plated roof trusses spanning approximately 80'-0" between the interior wood beams on either side of the ice surface, and wood joists spanning the remaining approximately 10'-0" between the interior and exterior beams.

As our observations at various stages of the assessment have included indications of excess moisture and a mould/mildew smell in the building, we also recommended the Town conduct a mould investigation to ensure the space is safe for public use. We understand the Town coordinated the testing by Thomas Contracting and the results indicated the airborne mould spores were not elevated to a concerning level and the source of the odour may be dead and rotting animal(s). The mould testing summary/report is appended here for reference.

We assume the original structure was designed and constructed in accordance with the Ontario Building Code or according to general practices at that time (circa 1970s) and therefore have not completed analysis of the structure as a whole, however we completed localized structural analysis of the following:

- Interior and exterior wood columns at the arena.
- Pad footing sizes for interior and exterior columns at the arena.
- Floor framing support at the enclosed exit ramp at the west side of the lobby.
- Roof joist and beam framing at the northwest entrance canopy.
- Roof joist and beam framing at the west arena exit canopy.

Our analysis was based on the following considerations:

 Ground Snow Load of 80 psf from time of original construction in accordance with the data for Trout Creek in the 1975 Ontario Building Code.

- Ground Snow Load of 2.7 kPa (56 psf) from the current (2024) Ontario Building Code.
- Community Centres are designated as High Importance facilities by the Ontario Building Code as they are likely to be used as shelters in an emergency situation.

The findings summarized below include visual observations during the subgrade investigation and results of localized analysis.

Interior Wood Columns

During the above-noted investigations, our findings at the interior wood columns surrounding the rink were as follows:

- The wood columns are in direct contact with soil beneath the concrete slab-on-grade floor and have suffered significant localized decay as a result. Settlement of these columns due to decay is evident (refer to Photograph 1).
- The wood columns are encased in concrete piers which extend to a 3'-0" x 3'-0" concrete pad footing terminating approximately 6'-0" below the top of slab elevation (refer to Photograph 2).
- A full-depth foundation wall on strip footings extends below the concrete curb surrounding the rink, however it is not connected to the piers at each column (refer to Photograph 2).
- The subgrade at the underside of the footings is capable of supporting a maximum bearing pressure of 150 kPa (SLS) (refer to geotechnical report, attached).
- The retrofit, bolted steel plates at each column provide some support to supplement the capacity lost to decay (refer to Photographs 3 and 4), however they are not sufficient to support the full roof snow loading as prescribed by the Ontario Building Code.
- Settlement of the columns is not uniform, and in localized areas where the settlement is most prominent, the overhead wood structure (beams, angle bracing, horizontal bracing) has been displaced and is at risk of failing (refer to Photograph 5).

Exterior Wood Columns

During the above-noted investigations, our findings at the exterior wood columns within the wall assembly surrounding the rink were as follows:

- Wall columns are exposed to exterior grade/moisture at the outside face of the building and have suffered varying levels of decay as a result (refer to Photograph 6).
- In the worst areas of decay, a section of the original columns has been replaced with pressure-treated blocking (no record of this work is available) (refer to Photograph 7).

Previous Structural Modifications

Given the current condition of the building and the proposed monitoring program for control of snow loading below, we analysed the exterior structural additions (access ramp and roof canopies on the west side of the arena) under a series of conditions. These include analysis under 1975 OBC loading; under current (2024) OBC loading; with and without snow drifting considerations; and with and without high importance category considerations. Analysis under these conditions was based on the assumption the Town could perform temporary snow (drift) removal on these areas as required and could divert emergency shelter away from this building as required. Based on this series of analyses, our findings were as follows:

- The access ramp does not meet the required geometry for accessibility in accordance with the Ontario Building Code (OBC).
- The access ramp framing is not adequate to support the loading prescribed by the OBC.
- The roof canopy framing at the northwest lobby entrance is not adequate to support the design snow loading in accordance with the OBC (note, the joist framing is sufficient based on the limited factors described above, however the supporting beams do not meet the required load capacity).
- The roof canopy framing at the west arena entrance is not adequate to support the design snow loading in accordance with the OBC (note, the joist framing is sufficient based on the limiting factors described above, however the supporting beams do not meet the required load capacity).

RECOMMENDATIONS

General

We made several recommendations in an interim memo (224503-5 dated October 11, 2024) which have since been carried out on an emergency basis to protect life-safety within the arena structure until the end of the 2024-25 season. These include the mould investigation noted above, as well as remedial work for temporary structural support and implementation of a monitoring program as described below.

Remedial Work

To reduce loading to the severely deteriorated interior columns and undersized retrofit brackets, we recommended installation of a series of temporary posts around the interior perimeter of the arena in accordance with attached drawings S.1 and S.2. This work was completed in December 2024 in accordance with our design and is sufficient, in combination with ongoing monitoring as noted below, to support the interior beams at the perimeter of the rink for the duration of the 2024-25 season.

The exterior canopies are to be removed or blocked off from public access on a permanent basis or until remedial work can be completed at the beams, at which time these areas shall be subject to the same maintenance and monitoring requirements as the arena roof.

Maintenance and Monitoring

In addition to the remedial work at the interior of the building, we've recommended a monitoring and maintenance program to proactively identify any additional movement or settlement at the affected framing, to monitor roof loading and to mitigate risk. The monitoring program has been established as follows:

- A total of five of the new interior shoring posts around the arena have been marked for plumb/level checks (refer to Photograph 8). These locations are to be checked daily by Town staff using a 2' or 4' level as a first-indicator of any movement. If an out-of-plumb reading is noted at any post, Tatham is to be contacted for review.
- Monitoring lines have been established at a representative sample (six) of the existing interior columns (refer to Photographs 9 and 10). These setups at the top of the columns are designed to indicate differential movement between the column and the beam structure above. These are also to be checked on a daily walkthrough by Town staff for any movement. If movement away from the baseline is observed, Tatham is to be contacted for review.
- The OBC design ground snow load for Trout Creek is representative of approximately 3'-0" of average snow. Drifted or compacted snow can weigh significantly more than average, and the building is not in a condition to withstand higher snow load. Therefore, following any snowfall of 12" or more (at ground level), the arena is to be closed to the public until a structural review can be completed by Tatham.
- At the exterior of the arena building, snow shall be kept clear of the building siding at ground level to prevent further moisture exposure and deterioration at the exterior columns.
- Tatham shall complete structural reviews monthly to monitor for indications of movement, settlement, or further deterioration.
- Snow removal may be required following major snow events if the facility is to be re-opened to the public, at the discretion of Tatham following site review.
- The facility shall not be used as an emergency shelter during inclement weather in its current condition.

The remedial measures implemented to protect life safety are sufficient to support the arena roof structure to the end of the 2024-25 winter (snow-loading) season, and through the non-winter months in 2025, provided no progression of concerns are identified through the monitoring program. This remediation is not intended to be a long-term solution and is not sufficient to consider the building in compliance with the Ontario Building Code. To maintain the structure in a safe state of repair for the long term would involve removal of all concrete surrounding the rink to access all interior and perimeter columns for concrete repair at the supporting piers, and replacement of all wood columns. This is in addition to the recommendations or our previous assessment which include other short-term requirements for the structure, building envelope, and mechanical and electrical systems. These repairs are cost prohibitive. In our opinion, replacement of the facility is a more economical option in the long term.

CONCLUSIONS

The structure has reached the end of its useful life. This type of structure (below-grade wood framing, uninsulated) has a shorter expected lifespan than current construction practices. The decay has been occurring since before a regular assessment program was implemented in 2007 and will continue to worsen, increasing both maintenance costs and risk to building users. The Town should commence planning for a replacement structure and/or use of alternative facilities and the building should be closed to the public at the end of the 2024/25 ice season or following any planned use in the summer of 2025.

We trust the information presented is satisfactory for your purposes at this time. Should you have any questions or require additional information, please do not hesitate to contact us at your convenience.

Yours truly, Tatham Engineering Limited



Madeleine Smith, B.Eng., M.A.Sc, P.Eng. Senior Engineer, Project Manager CG/MPS:ha

copy: Mark Martin Brayden Robinson Municipality of Powassan Municipality of Powassan mmartin@powassan.net brobinson@powassan.net

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Photograph 1: Deterioration below slab - interior column



Photograph 2: Concrete pier adjacent foundation wall - interior



Photograph 3: Retrofit bolted steel plates - interior column



Photograph 4: Retrofit bolted steel plate bearing - interior column



Photograph 5: Settlement effects at overhead structure



Photograph 6: Deterioration at original column - exterior



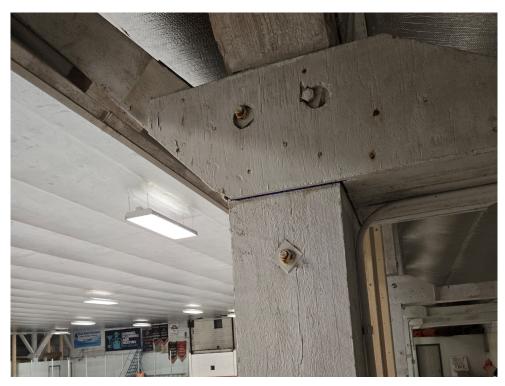
Photograph 7: Blocking at deteriorated column - exterior



Photograph 8: Marked post and level check at representative monitoring location



Photograph 9: Representative monitoring between column and adjacent structure



Photograph 10: Basic monitoring line at representative column location

Appendix A: Drawings & External Reports From: Grant Johnson <asbestos@vianet.ca>
Sent: October 23, 2024 12:53 PM
To: Fred Schmeltz <fschmeltz@powassan.net>
Subject: Re: Quotation No. 2024078 - Trout Creek Community Centre

Hi Fred,

Received the lab results (attached) for the mould air testing we conducted at the Trout Creek Community Centre.

Results reveal that there is no elevated levels of airborne mould spores within the 2 tested areas (Area #1 and Area # 2) of the Centre.

As per our conversation onsite, it is our opinion that the noticeable odor is emanating from the fan room off the lobby area.

This odor is similar to a dead and rotting animal(s) and is stronger when the fan unit is running.

Our recommendations is to clean/disinfect all duct work (including intake duct) as well as the fan unit itself and the fan room in question.

Thanks,

Grant Johnson Manager Environmental Services Thomas Contracting (705) 499-8006

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info@moldbacteria.com www.moldbacteria.com

Laboratory Analytical Results

CONTACT NAME	: Grant Johnson	TYPE OF SAMPLES:	Air: Allergenco	PROJECT NAME:	Trout Creek Community Centre Mould Testing
COMPANY:	Thomas Contracting	NO. OF SAMPLES:	3	PROJECT NO:	TC-201660
ADDRESS:	212 A Birchgrove DR. East Callander, ON P0H 1H0	DATE COLLECTED: DATE RECEIVED: DATE ANALYSED:	2024/10/18 2024/10/22 2024/10/22	LAB REFERENCE: ANALYSED BY:	MBL20381ANA Jackson Kung'u, PhD.
PHONE:	705 499-8006	DATE REPORTED:	2024/10/23	REVIEWED BY:	Georget Shamoon, PhD.

Method of Analysis: Based on ASTM D7391 - 09 Standard Test Method for Categorization and Quantification of Airborne Fungal Structures

Analysis is performed according to the SOP-MBL-M-3- Analysis of Fungi in Air Samples by Direct Microscopic Examination (DME). The slide impacted with air sample is placed on a drop of lactophenol cotton blue on a clean microscope slide and subsequently scanned at X 100 or X 200 magnification to give the analyst an overview of sample deposition and the diversity of the spores present on the slide. The slide is then analysed at X400 or X600 magnification by counting and identifying spores in at least 20% of the sample deposition area. Spores occurring in chains are counted individually. Raw counts are converted to spores/m³ of air. Spores lacking distinguishing characteristics are reported as "Unidentified spores". Where the analyst is able to identify the group to which the spores belong but not the mould they belong to, the spores may be recorded as "Unidentified Basidiospores or Unidentified Ascospores". Spores of *Aspergillus* and *Penicillium* (and others such as *Acremonium*, *Paecilomyces*) are difficult to distinguish and are reported as *Aspergillus/Penicillium*.

A scale of 0 to 5+ is used to rate abundance of non-fungal material (debris), with 5+ indicating the largest amount. Large amounts of debris may obscure small spores. Therefore, counts from samples with 5+ non-fungal material may be treated as undercounts. Except for blanks, samples with no detected spores are recorded as "less than the method detection limit" (MDL). Results are not corrected for blanks.

Summary Results/Interpretation or Comments (where applicable):

Please see results on page 2.



1020 Brevik Place, Unit 1A Mississauga, ON L4W 4N7 905-290-9101



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Laboratory Analytical Results

					PROJECT NO:TC-201660TYPE OF SAMPLES:Air: Allerger											MBL20381ANA Jackson Kung'u, PhD.					
Client's Sample No: 6163791			6163442			(6163694														
Lab Sample ID:	MBL20381ANA-1		MBL20381ANA-2			MBL20381ANA-3															
Sample Description Area #1		#1	Area #2			Area #3															
Other Sample ID No.	6163791			6163442			6163694														
Total Air Volume (L)	150		150		150																
Sample Area Analysed (%)	25		25		25																
Fungal spores identified	raw ct.	%	ct./m ³	raw ct.	%	ct./m ³	raw ct.	%	ct./m ³	raw ct.	%	ct./m ³	raw ct.	%	ct./m ³	raw ct.	%	ct./m ³	raw ct.	%	ct./m ³
Alternaria sp.							2	1	53												
Ascospores (undifferentiated)				1	3	26	7	2	184												
Aspergillus/Penicillium sp.	18	43	473	9	26	237	10	3	263												
Basidiospores (undifferentiated)	6	14	158	13	37	342	91	25	2393												
Chaetomium sp.																					
Cladosporium sp.	11	26	289	10	29	263	192	53	5050												
Coprinus sp.	1	2	26				2	1	53												
Curvularia sp.																					
Drechslera/Bipolaris group																					
Epicoccum sp.	4	10	105	2	6	53	42	12	1105												
Fusarium sp.																					
Ganoderma sp.							1	0	26												
Helicospores																					
Pithomyces sp.																					
Rusts/Smuts/Myxomycetes	2	5	53				3	1	79												
Stachybotrys sp.																					
Ulocladium sp.																					
Other unidentified spores							11	3	289												
Pollen																					
Fungal fragments Counts																					
Debris Rating (0-5+)	2+			2+			3+														
Spores/sample	166			138			1424														
TOTAL SPORES/M ³			1,105			921			9,495												
MDL (SPORES/M ³)			26			26			26												

Notes: 1. Samples analysed at X600 magnification 5. The result(s) relate only to the sample(s) tested.

6. This test report shall not be reproduced except in full, without written approval of Mold & Bacteria Consulting Laboratories (MBL) Inc.





www.moldbacteria.com

(ISO/IEC 17025:2017 Accredited Laboratory...)

References

1. ASTM Designation: D 7391-09. Standard Test Method for Categorization and Quantification of Airborne Fungal Structures in an Inertial Impaction Sample by Optical Microscopy.

2. Illustrated Genera of Imperfect Fungi. Barnet H.L and B. Hunter Barry. Burgess Publishing Company. Edition 3. 1972. ISBN 8087-0266-1

3. Sampling and Identifying Allergenic Pollens and Molds. An Illustrated Identification Manual for Air Samples. Edited by E. Grant Smith. Blewstone Press. San Antonio, Texas. 2000. ISBN 0-930961-02-1

4. The Air Spora. A Manual for Catching and Identifying Airborne Biological Particles. Edited by Maureen E. Lacey and J. S West. 2006. ISBN-13 978-0-378-30252



Soil Engineers Ltd.

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November 5, 2024

Reference No. 2409-C087

Tatham Engineering 8 Barron Drive Bracebridge, Ontario P1L 0H3

Attention: Ms. Madeleine Smith, P.Eng.

Re: **Founding Level Inspection Trout Creek Community Centre** 181 Main St. W **Trout Creek**, Ontario

Dear Ms,

As requested, we visited the site on September 19, 2024 to inspect a test pit dug adjacent to an interior pier footing for an assessment of the subsurface conditions and to determine the engineering properties of the disclosed soils. Our findings are presented herein.

The field work consisted of a test pit dug by an excavator to the underside of footing elevation approximately 1.8 +/- m below the finished floor elevation.

The inspected founding level subgrade consists of sound natural soil comprised of dense silty sand.

As a guide a Maximum Allowable Soil Bearing Pressure of 150 kPa (SLS) 250 kPa (ULS) can be used for the building renovations.

We trust this report is explicit: however, should any queries arise, please do not hesitate to contact us.

Yours very truly, SOIL ENGINEERS LTD.

Mika Fager, Geo. Tech. Branch Manager – Muskoka | Partner

This letter/report/certification was prepared by Soil Engineers Ltd. for the account of the captioned clients and may be relied upon by regulatory agencies. The material in it reflects the writer's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this letter/report/certification, or any reliance on or decisions to be made based upon it, are the responsibility of such third parties. Soil Engineers Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this letter/report/certification.

GENERAL NOTES

- THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTS PREPARED BY ALL 1. WOOD AND ENGINEERED LUMBER COMPONENTS SHALL BE DESIGNED, FABRICATED, AND INSTALLED IN 1. CONSULTANTS PRIOR TO CONSTRUCTION. REPORT DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.
- 2. ALL DIMENSIONS ARE IN FEET AND INCHES EXCEPT AS NOTED.
- THE CONTRACTOR SHALL REVIEW ALL DRAWINGS AND CONTRACT DOCUMENTS PRIOR TO AND DURING 3. CONSTRUCTION TO ENSURE THAT THE ASSUMPTIONS MADE IN THE DRAWINGS REFLECT THE REQUIREMENTS OF CONSTRUCTION AND FIELD CONDITIONS ENCOUNTERED. WHERE DISCREPANCIES ARISE OR THE CONTRACTOR FINDS 4. AN ERROR OR OMISSION RELATING TO THE CONTRACT, THE CONTRACTOR SHALL PROMPTLY REPORT IT TO THE ENGINEER AND SHALL NOT PROCEED WITH THE ACTIVITY AFFECTED UNTIL RECEIVING DIRECTION FROM THE ENGINEER.
- THE DRAWINGS SHOW THE COMPLETED STRUCTURE. THE CONTRACTOR IS RESPONSIBLE FOR SAFETY ON THE JOB 4. SITE AND FOR DESIGN. INSTALLATION AND SUPERVISION OF ALL TEMPORARY BRACING AND FALSEWORK TO SUIT THE CONSTRUCTION METHODS AND TO SUPPORT THE SUPERIMPOSED CONSTRUCTION LOADS. DESIGN AND FIELD REVIEW OF ALL TEMPORARY WORKS TO BE CARRIED OUT BY A PROFESSIONAL ENGINEER RETAINED BY THE CONTRACTOR, LICENSED AND INSURED IN THE PROVINCE OF ONTARIO.
- ALL WORK AND MATERIALS SHALL CONFORM TO REQUIREMENTS SET OUT IN THE 2012 ONTARIO BUILDING CODE.
- ALL CODES AND STANDARDS REFERENCED SHALL BE THE LATEST EDITION REFERENCED BY THE 2012 ONTARIO 6. BUILDING CODE (DIV. B, 1.3.1.2).
- 7. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT OF ONTARIO.
- ALL DESIGN LOADS NOTED ON DRAWINGS ARE SPECIFIED LOADS (UNFACTORED) TO BE USED FOR ULS 8. (FACTORED) DESIGN, UNLESS OTHERWISE NOTED:

A) ROOF DEAD LOAD = 20 psf

CLIMATIC DATA (TROUT CREEK): SNOW: Ss

Sr

- = 56 psf = 8.4 psf
- 9. DO NOT CUT OR DRILL ANY OPENINGS IN STRUCTURAL MEMBERS WITHOUT WRITTEN PERMISSION FROM THE STRUCTURAL CONSULTANT UNLESS SPECIFICALLY NOTED ON THE STRUCTURAL DRAWINGS.

WOOD FRAMING

- ACCORDANCE WITH CAN/CSA-086 AND THE ONTARIO BUILDING CODE (OBC) PART 9.
- 2 ALL LUMBER SHALL BE NO. 1/2 GRADE SPF IN ACCORDANCE WITH CSA 086, UNLESS NOTED OTHERWISE.
- DO NOT CUT, DRILL OR NOTCH TIMBER MEMBERS WITHOUT ENGINEER'S APPROVAL. 3.
- ROUGH CARPENTRY SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF OBC PART 9, UNLESS NOTED OTHERWISE.
- ALL LUMBER FASTENING SHALL BE IN ACCORDANCE WITH OBC PART 9 OR MANUFACTURER'S SPECIFICATIONS. 5 UNLESS NOTED OTHERWISE. ALL NAILS, SPIKES, AND STAPLES SHALL BE IN ACCORDANCE WITH OBC 2012, 9.23.3.
- 6. ALL BOLTS AND ACCOMPANYING HARDWARE SHALL BE IN ACCORDANCE WITH ASTM A307 - GRADE A, UNLESS NOTED OTHERWISE.
- SPECIFIED CONNECTORS SHALL BE MANUFACTURED BY SIMPSON STRONG-TIE. SUBSTITUTIONS SHALL BE 7. SUBMITTED FOR ENGINEERS APPROVAL PRIOR TO CONSTRUCTION.
- 8. ALL PROPRIETARY CONNECTORS AND FIXINGS ARE TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
- 9. NON-TREATED WOOD IN CONTACT WITH CONCRETE OR STONE SHALL BE PROTECTED BY SILL GASKET OR 6 MIL POLY.
- 10. PRE-DRILL ALL LAG BOLT HOLES PRIOR TO INSTALLING BOLTS.
- 11. BUILT-UP POSTS SHALL BE NAILED TOGETHER @ 6" o/c, STAGGERED, EACH SIDE, UNLESS NOTED OTHERWISE.

