

**BC BUILDING SCIENCE & ENGINEERING LTD**

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BUILDING ENVELOPE & STRUCTURAL CONSULTANTS - WWW.BCBUILDINGSCIENCE.COM

**Strata Plan VAS 2876 (02-0604)****April 16, 2003****FIELD REVIEW****880 West 21st Avenue, Vancouver, B.C.****Page 1 of 3****817/03**

TO Strata Plan VAS 2876

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cc: Appleton Contracting Ltd. (Site)

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cc: Marathon Warranty

Art Doyle

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**Existing Roof Framing:**

17.1 The contractor has removed a portion of the box joist from select areas at the roof edge to allow us to determine the framing of the roof in order to attach the new roof overhang. At the north edge of the roof (west end - near masonry wall) the 2x8 sleepers have been installed with a 3" space between the underside of the sleepers and the top of the 2x10 roof joists. A 2x8 diagonal sleeper (similar to a hip member of a roof) was installed from the northwest corner of the roof and spanned to the southeast. (See enclosed plan on page 2) On the southwest side of the diagonal, the 2x8 sleepers spanned east-west and on the northeast side of the diagonal, the 2x8 sleepers spanned north-south. Vertical pieces of 2x4 have been nailed to the side of the 2x10 roof joists to support the diagonal sleeper. No interior support of the other sleepers was installed. Therefore, the roof joists are not uniformly loaded by the roof sleepers as originally designed. Under building code snow loads:

- a. the 2x8 roof sleepers will deflect more than allowed by the code when the span exceeds 9'-0" and becomes overstressed at spans greater than 10'-9".
- b. the weight of the snow will only be transferred to the roof joists at the supports for the diagonal sleeper. This creates a concentrated load on the roof joist rather than the uniformly distributed load used in the original design. The roof joists will exceed the code allowable deflection limits and become overstressed under this condition.

**Recommendations:**

We recommend that additional plates be installed, perpendicular to the roof joists at 2'-0" o.c. (or under each sleeper) to fill in the space between the sleepers and roof joists. This work is necessary for two reasons:

- a. This will uniformly distribute the snow load along the entire span of the 2x10 roof joists as per the original structural design.
- b. The plates will provide lateral support for the top edge of the roof joists.

This work would necessitate the removal of the entire roof membrane system and plywood sheathing.

Should this work not be completed, there are certain risks that the owner's should be aware of including, but not limited to:

1. The gypsum board ceilings may crack due to deflection of the roof joists under high snow loading.

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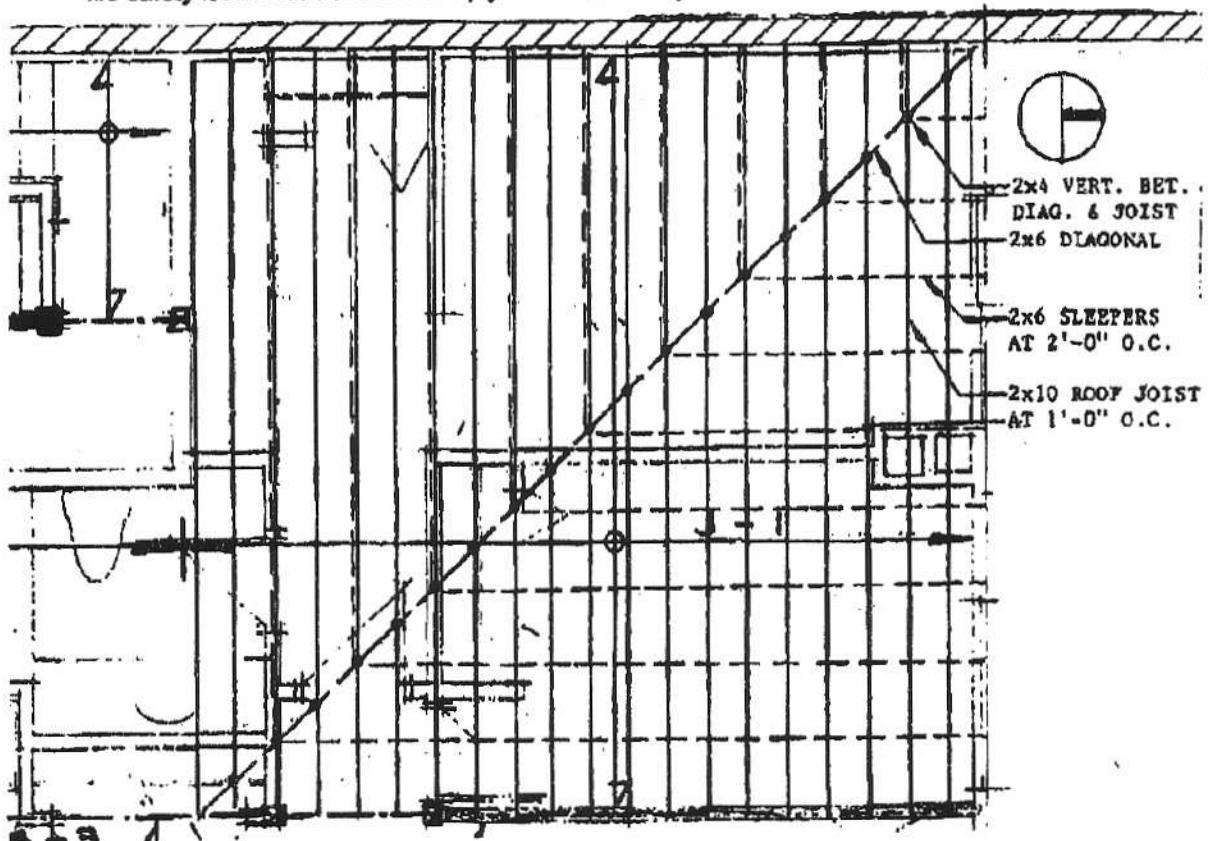
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2. The sleepers may collapse onto the roof joists which would likely result in membrane failure.
3. The sleepers may deflect, resulting in additional ponding of water and possibly localized fractures of the roof membrane.
4. The roof is not constructed to meet the current building code or the building code required at the time of construction. It is difficult to predict when or if this condition could result in a life safety issue. We do note that wood framing has additional capacity above the code limits due to variations in lumber strengths.

The new roof overhang does not affect the loading of the interior roof joists and therefore will not exacerbate the problem with the existing roof framing. All vertical loading from the new overhang is supported at the exterior wall.

Although the existing roof assembly is beyond the scope of the building envelope remediation work and was not included in the original budget, we would like the strata to be aware of this potential problem and recommend it be repaired as soon as possible. This construction is not an immediate life safety issue but does not comply with the building code.



**PARTIAL ROOF FRAMING PLAN (NORTHWEST CORNER OF BUILDING)**

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**Chimney Framing at East Wall:**

- 17.2 We recommend that the contractor remove the bottom panels of dense glass at the chimney build-out to allow us to inspect the framing of the chimney.

Reported by: Dan Kunimoto, P.Eng.  
& Andrew Creighton, A.Sc.T.