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NATIONAL RESEARCH COUNCIL OF CANADA

DIVISION OF BUILDING RESEARCH

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TECHNICAL NOTE

NOT FOR PUBLICATION

FOR INTERNAL USE

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CHECKED BY

APPROVED BY N. B. H.

DATE January 1962

PREPARED FOR Research Committee, National House Builders Association

SUBJECT THIRD VISIT TO MARK II HOUSE, FOREST LAWN, ALBERTA

A description of the Mark II House and observations made during two previous visits, in March and November 1960, are reported in DBR Internal Report No. 244 of the Division of Building Research. This technical note presents a summary of the observations made during a subsequent visit to the house on 28 June 1961.

Crawl Space and Foundation

Examination of the crawl space indicated no significant change from previous visits in the condition of walls or footings. The slight displacement between the concrete floor and centre footing appeared to have remained constant (Fig. 1) and no cracks were evident in the slab. The dark areas at mortar joints, noted during the previous visits, were no longer evident.

Floor System

Excessive springiness of the floor was still the chief complaint of the occupants, and at one location in the kitchen a deflection and squeak had been noted. This was found to be due to splitting of one joist which had originally been saw cut and scabbed to reduce crowning during construction.

The separation between the top of the storage cabinet and the ceiling (Fig. 2), and between the base of the stub wall and the floor in the kitchen (Fig. 3) appeared to have remained the same or to have decreased somewhat. Gaps between the edges of plywood flooring were no more severe and surface checking of the painted plywood floor was no more pronounced.

Interior Finish

Very little cracking of plasterboard was observed anywhere in the house. Some deterioration of the surface of window sills and stops was evident, and some closet and room doors were sticking slightly. The latter condition was no more severe than would be expected from seasonal moisture content changes. The condition of the house interior was essentially the same as during the previous visit in November 1960.

Windows

The caulking around the sealed double-glazed window units had become brittle and hard, providing very little protection against the entry of water behind the wood stops, particularly at the sill (Fig. 4). The occupant had recaulked some of the windows but expressed dissatisfaction with subsequent performance of the material.

The occupant reported that some condensation had occurred within the sealed units during the winter, and had been particularly severe in the centre bedroom unit. Droplets of water were evident in this window at the time of visit, although difficult to see in the photograph (Fig. 5).

Perforated Hardboard Soffit

Failure at panel joints in the perforated hardboard had occurred at almost all locations with the ends of boards sagging in many places (Figs. 6 and 7). This appeared to be due to excessive shrinkage of the hardboard causing failure of the board in tension at nails. It clearly indicated the need for some simple means to allow for expansion and contraction when employing this type of material.

The occupant also reported that, with the resultant larger openings at points of failure, he had noted wood shavings being blown out of the attic space under the action of wind. This constituted no serious problem but might indicate substantial air movement within the attic space.

Exterior Cladding

Checking of the plywood exterior finish had become more severe (Figs. 8, 9) and delamination was evident in some areas (Fig. 10). Checking of the plywood was general, however, and not particularly confined to one exposure. Painting or restaining of the house was being considered by the occupant.

Carport

A slight sag toward the extremity of the carport roof ridge was observed. On further examination it appeared to be due to shrinkage and twisting of the supporting beams rather than to any foundation movement. Shrinkage of the ridge beam was evident at the junction of the wall of the house (Fig. 11) where an unpainted area of the rafter was exposed. The outer ends of the two mid-span beams showed that twisting had occurred in a manner which tended to spread the outer rafters and resulted in a lowering of the ridge at the extremity (Fig. 12).

It is interesting to note the unsightly appearance of the nails projecting through the roof cladding in the carport (Figs. 11 and 12). These resulted from the necessity of shingling the roof after the failure of the original plastic coating.

It may also be of interest to record that the occupant's wife found the roofed carport to be ideal as a play area for children during the hot Calgary summer.

Heating and Ventilating

The occupants appeared to be quite pleased with the operation of the system, both in winter and in summer. The only difficulty that was reported involved the downward movement of hot air through the ceiling openings if these were not closed during the day. This apparently occurred regardless of the operation of the furnace fan.

Servicing of the thermohygrograph had been somewhat of a problem because of the occupant's recent illness, and in view of his forthcoming move to another house, it was suggested that readings be discontinued and the instrument returned to Saskatoon.

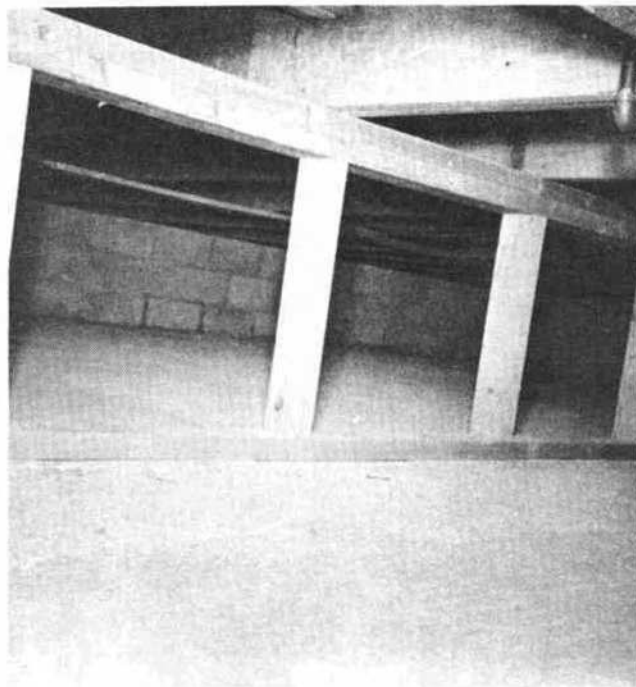


Figure 1 Crawl space bearing partition

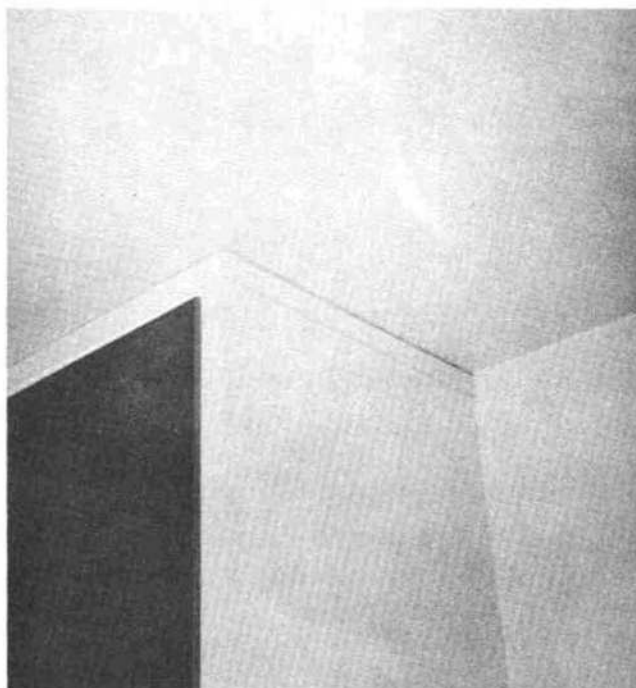


Figure 2 Kitchen storage cabinet

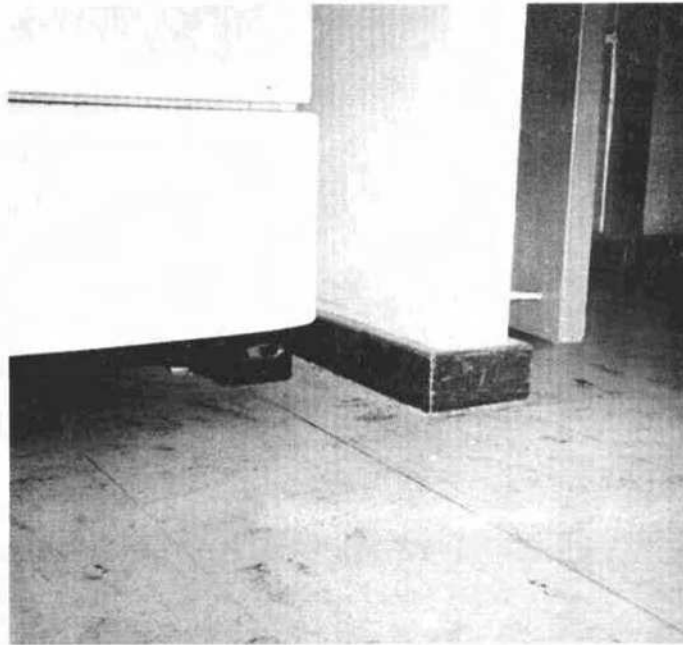


Figure 3 Stub wall in kitchen

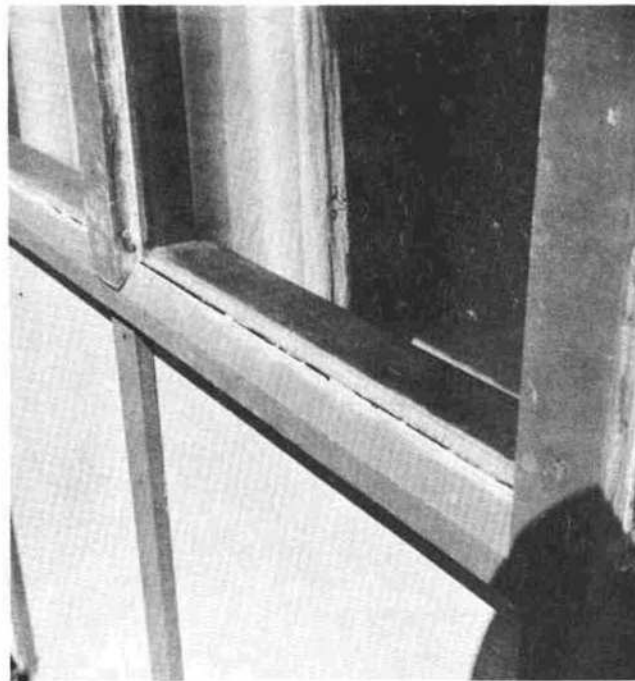


Figure 4 Deterioration at sill of window



Figure 5 Centre bedroom window

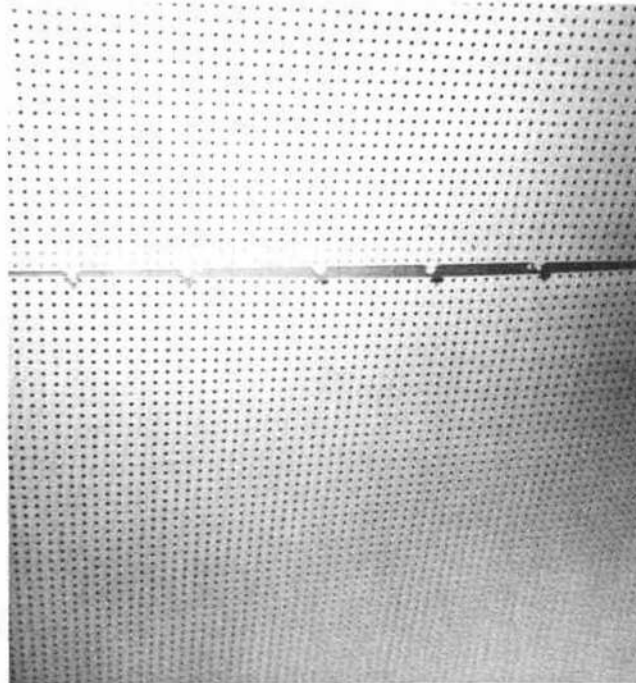


Figure 6 Joint failure in hardboard soffit

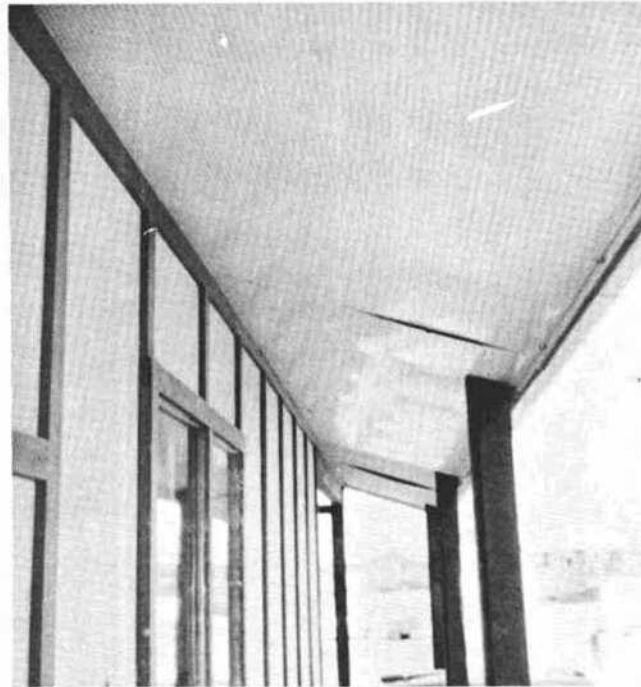


Figure 7 Failure at joints in hardboard soffit



Figure 8 Checking of plywood exterior (east wall)

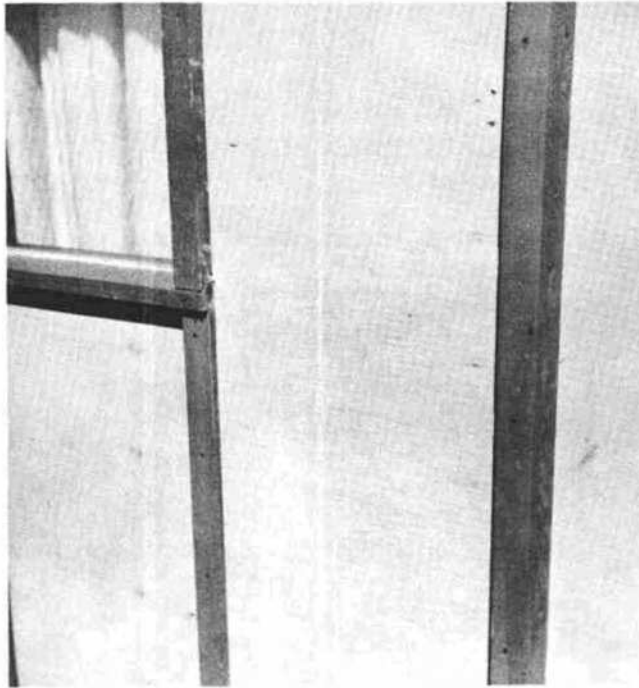


Figure 9 Checking of plywood exterior (s.w. corner)

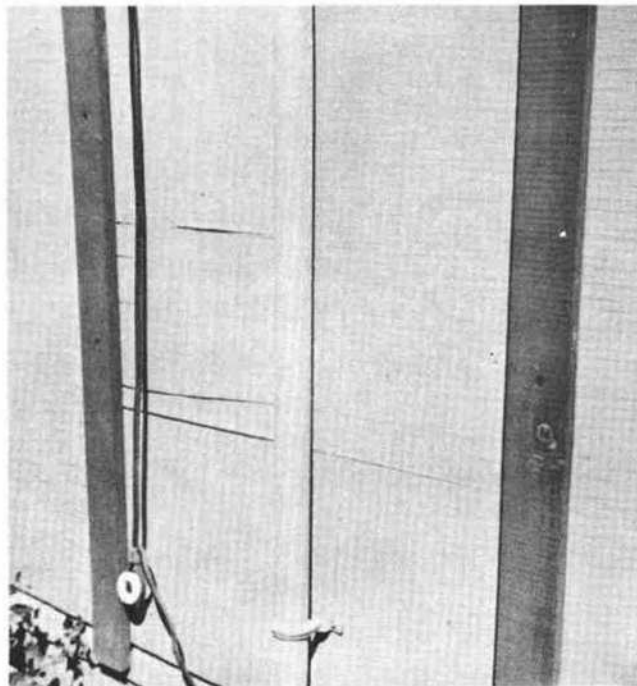


Figure 10 Checking and delamination of plywood exterior
(west wall)

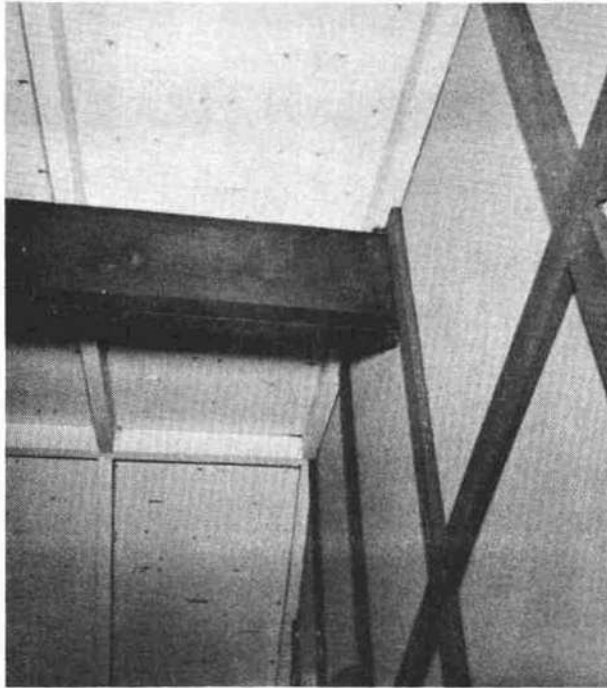


Figure 11 Shrinkage of carport beam

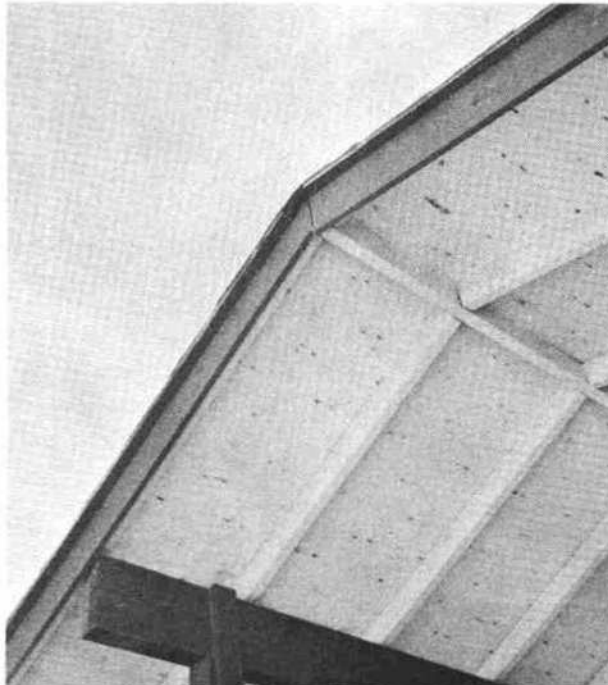


Figure 12 Evidence of sag in carport roof ridge