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### **Proposed Observations on the NHBA Mark III House, R.C.A. F. Station, Rockcliffe, Ontario** Dickens, H. B.

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DATE January 1962

PREPARED FOR Research Committee, National House Builders Association

SUBJECT PROPOSED OBSERVATIONS ON THE NHBA MARK III HOUSE,  
R. C. A. F. STATION, ROCKCLIFFE, ONTARIO

The NHBA Mark III house, located on the R. C. A. F. Station at Rockcliffe, is the third experimental house project undertaken by the Research Committee of the National House Builders Association. It was completed and occupied in July 1961. Two earlier experimental houses known as the Mark I and Mark II were constructed at Preston, Ontario, in 1957 and Forest Lawn, Alberta, in 1959. A Mark I house was also built at Dartmouth, N. S., in 1958 and this same house design with various modifications was later used extensively in two new subdivisions in that area.

The objective of this program is the evaluation of new building materials and components in housing. The houses themselves are not intended to represent advancements in over-all layout or design but are used solely as a means of assessing in actual practice the technical performance and cost potential of the new materials and methods of construction which are included in them.

The Division of Building Research as a member of the Research Committee of the National House Builders Association has agreed to assist with this program by undertaking regular observations of the performance of each experimental house project. Due to their location, observations of the houses at Preston and Forest Lawn have of necessity been limited to periodic visits by members of DBR staff. With the close proximity of the Mark III house to DBR facilities in Ottawa, it has been

possible to institute more detailed observations of this project. This note outlines the extent of these observations.

### Foundations

(1) Elevation reference points have been located around the perimeter of the building and have been tied to a reference bench mark. These will be surveyed two or three times each year to determine whether any movement of the building has occurred. An analysis of the soil has been made and information on moisture content and grain size obtained.

(2) In an attempt to assess the decay hazard incurred by the wood foundations, 36 untreated red pine sapwood stakes 1 inch square have been installed in the crawl space as follows:

10 stakes have been placed within the exterior foundation wall space and suspended so as not to be in direct contact with the wood foundation members.

20 stakes have been driven into the ground in the crawl space immediately adjacent to the small concrete pad supporting the wood stud perimeter foundation wall.

6 stakes have been driven into the ground in the crawl space beside the centre wood foundation wall.

One stake will be removed from the wall space at each six-month interval for the first three years and one from each of the ground locations at each three-month interval for the first year and then each six-month interval for the next two years and will be sent to the Forest Products Research Branch for pathological examination. In addition, periodic checks of moisture content using a moisture meter will be made of the stakes at each location and also of the wood foundation framing members.

(3) Continuous observations of temperature and humidity in the crawl space are being recorded by means of a hygrothermograph and periodic visual checks will be made during the winter for evidence of condensation within the crawl space walls.

### Walls

- (1) Two sections of the asbestos cement board siding on the north and east walls have been fastened with screws to permit their removal to check for evidence of condensation in the wall space during winter operation.
- (2) Notes have been taken of the application of paint to the asbestos cement siding on the south and east walls of the house. These walls will be kept under observation for possible paint performance problems.

### Roof

- (1) Access panels have been provided in the plywood ceiling in the kitchen and in the bathroom to permit periodic checks for evidence of condensation in the roof space during winter operation.
- (2) Initial readings of temperature and humidity in the roof space at the time of occupancy have been recorded and periodic checks of both temperature and humidity will be made in the roof space during the year by means of a hygrothermograph located in this space for short periods.
- (3) Snow depth gauges have been installed on the roof and the house has been included in the roof snow load survey by the Building Structures Section of the Division.

### Heating and Ventilating

- (1) Arrangements have been made with the Building Services Section of the Division to include this house in their indoor climate survey. This will involve continuous records of temperature, humidity and fuel consumption during the winter. Since the introduction of air from the outside through the ventilating duct arrangement would tend to complicate the assessment of the performance of the heating system, it has been agreed with Mr. S. A. Gitterman to operate the system during the winter of 1961-1962 with the dampers closed so that there will be no positive introduction of fresh air during the heating season. This will facilitate a comparison of the indoor climate records with those of other houses and provide a clearer indication of the over-all thermal characteristics of the house. Operating with the dampers controlled automatically by a humidity

sensing element as originally proposed, has been postponed at least until the winter of 1962-63.

(2) The furnace efficiency has been determined and a survey of the airtightness of the building has been proposed and will be carried out subject to the tenant's agreement.

(3) Observations of temperature and humidity within the living area will be continued throughout the summer to determine the effectiveness of the ventilation system on summer conditions.

#### Sewage System

Regular readings are being made of the counters installed to record the number of toilet flushings and the number of cycles of the overflow pump.

#### General

In addition to the specific observations noted above, it is intended to keep the Mark III house under regular observation with the object of initiating more intensive studies of other aspects which may appear to warrant more detailed investigation.