Visit to Arnprior Airport to inspect Building No. 26, February 4th, 1953

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TECHNICAL NOTE

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PREPARED FOR Mr. J. C. Elliott DATE Feb. 11th, 1953.

SUBJECT: Visit to Arnprior Airport to Inspect Building No. 26, February 4th, 1953.

On January 8th, 1953, Building 26, Arnprior Airport was damaged by fire, the cause of which was associated with the heating apparatus. An investigation was held on January 12th and a detailed report submitted by Mr. J. C. Elliott, Plant Engineering Services. In this report it was suggested that one of the contributing factors to the cause of the fire might have been the deterioration of the building over the years resulting in an increased forcing of the heating system to combat the additional heat losses. The purpose of this visit, therefore, was to inspect the fire damaged building and see if there was evidence of such deterioration. Arrangements had been made previously by Mr. Elliott for the Plant Engineering staff in Arnprior to open up wall spaces for inspection if it should be found necessary.

Upon arriving in Arnprior the writer contacted Mr. H. H. Kelland and discussed the proposed inspection of the building. It was learned that no insulation existed in the walls of the Arnprior buildings, but only in the ceilings. This was verified later by inspection of exterior walls in Building 26 and Building 4. There followed a brief discussion of electrical controls for stoker-fired warm air furnaces such as that in Building 26, the Station Electrician Mr. J. L. Lynch being present. Mr. Kelland then requested Mr. Lynch to accompany the writer in an inspection tour of the buildings, particularly Building 26 where the fire had occurred, and Building 22, where a similar stoker-fired warm air furnace was in operation.

The following observations were made with respect to the buildings visited:

(1) Building 26 Fire-hall and Apartment

The fire-hall and furnace-room sections of this building are built on concrete foundation walls with concrete floors apparently in good condition. The apartment section of the building

is built on concrete piers with crawl space below the floor having wooden skirting at the perimeter. Exterior walls of all sections are frame construction with two layers of plaster board on the interior of the studs, and wood sheathing, building paper and asbestos-cement shingles on the exterior. Ceiling and roof are of frame construction with attic space above the central (apartment) section. Ceiling interior finish is fibreboard throughout, with mineral wool batts between joists immediately above the fibreboard. All windows are of wood frame and sash and are equipped with storm sash. At the time of inspection three small coal-fired space heaters were being used to heat the premises in lieu of the regular stoker-fired warm air furnace which was inoperative after the fire. Flues from the space heaters were carried through the upper portion of windows, the glazed sash of which had been replaced by sheet metal panels. Examination of the building showed no evidence of any serious deterioration which might have contributed to excessive heat losses and a consequent forcing of the heating system.

(2) Building 22 Recreation Hall

The furnace room only was visited in this building, the walls being of frame construction and similar to the other buildings except for an interior finish of asbestos board. The heating equipment is similar to that of Building 26 except somewhat larger, consisting of a Clare-Hecla fan furnace unit with automatic stoker. Instead of two independent bonnet controls for fan operation and overheating safety cut out, these two controls are combined into one unit mounted in the bonnet. A clock timer mounted on the wall is used to cycle the stoker for mild weather operation. It was noticed that neither of these controls had the covers on and that there was considerable dust accumulation in them. At the time of inspection the unit was on a firing cycle and the flue pipe was observed to be at about normal temperature for such a unit. The chimney was apparently built in the same manner as that of Building 26, that is in the corner of the room up against two wood frame walls. However, there is no wooden partition for the flue pipe to have to go through as was present in Building 26. The closest combustible material to the flue pipe is the exterior wall of the room where the pipe enters the chimney. This is about six or eight inches away from the pipe and is finished with asbestos board which butts up against the side of the chimney.

(3) Building 4 Barracks

This is an H-shaped two storey building of frame construction with walls having an exterior of asbestos-cement shingles on building paper and wood sheathing, and an interior of two layers of plaster board, with no insulation between. Ceilings are of fibreboard on joists with mineral wool batts between joists. The exterior walls of the building are on concrete foundations with crawl space under the building containing concrete piers for support of the wooden floor beams. Small vent openings, two on either side of each wing, were observed to be open although the

screens were broken. The crawl space appeared to be quite damp and it was reported that water collected under this building after a rain. Rotting of the beams had become so acute that the sills for the washroom section had had to be replaced, and according to Mr. Chenosky, the old sills had so deteriorated that the rotten wood was removed "by the handful." There was further evidence of deterioration due to either settlement of the concrete piers or rotting of the floor beams or joists. The floor of the lower storey had sunk a matter of inches in some places and the whole interior had settled as a unit, pulling the upstairs partitions away from the roof to leave gaps as wide as five inches in some places.

A fire had occurred some time ago in the upper floor of the west wing of the building and the blackened woodwork and walls were never repaired and refinished, although the roof had been repaired. Holes in the exterior walls were observed where daylight could be readily seen, even though the heat was still on in the building. There was evidence of birds nesting in the building. Some pilfering of electrical fixtures had left bare wires in some of the wall outlets, although the fuse panel in the hall, which had no cover, seemed to be supplied with a full complement of fuse plugs. The electrician assured the writer, however, that the only electrical power circuits in operation were those for the lights of the lower floor and those for motorized valves for the heating system.

(4) Building 1 Storeroom

This is a single storey building of similar construction to the others, except that there are no concrete foundations below exterior walls. It is in extremely bad repair. Hardwood floors have heaved into ridges about eight inches high in some places, while in others the floor has sagged to two or three feet below normal level. It is believed that the floor supports in some places must be rotted completely away. This building was not being supplied with heat or power. On the sounder portions of the floor, trunks, boxes and personal belongings of the camp staff were being stored.

Summary of Observations

Although some of the buildings examined show signs of serious deterioration no such evidence could be found in connection with Building 26 where the recent fire occurred. It is therefore felt that forcing of the heating system due to excessive heat losses other than the usual demand at low outside temperatures was probably not a contributing factor in the cause of the fire.

No additional evidence other than the points mentioned in Mr. Elliott's report of the investigation would point to the direct cause of the fire. However, there is one possibility, though remote, which the writer feels should not be overlooked. It would be quite possible for the furnace and flue pipe to become seriously overheated if:

(a) the room thermostat were to have allowed the stoker to operate continuously without shutting off (as might well have happened with a furnace of insufficient capacity operating with a thermostat setting of 85°F and an outside temperature of -15°F) and

(b) if at the same time the fan had become inoperative, through faulty motor or drive, or bonnet control failing to turn the fan on when the proper bonnet temperature was reached, and

(c) if at the same time the bonnet high limit control had failed to shut off the stoker unit upon rise of bonnet temperature.

It would be quite possible for the high limit control of such an installation, if not inspected regularly, to remain out of commission for some time without interfering with the normal operation of the stoker and fan.