

NEW ARCTIC TOWNSITE

The Minister of National Health and Welfare, Mr. J.W. Monteith, and the Minister of Public Works, Mr. David J. Walker, have jointly announced the calling of tenders for construction of a new hospital building at Frobisher Bay on Baffin Island. Actually, the tender call is the beginning of the first phase of construction of a new townsite at Frobisher Bay, which is the administrative centre for the Eastern portion of the Canadian Arctic. The new town is expected to cost a total of some \$12.5 million. The work will be carried out by the Department of Public Works in co-operation with the Department of Northern Affairs and National Resources.

The hospital will be the first major building erected in the new town. Also included in the first phase of construction, which will be under way this year, will be the preparation of the site, which will include blasting the top off a promontory known as Astro Mountain, which lies uphill from the present settlement. This will provide a level plateau and rock foundations for the new town. Also included in the first phase are roads, sewer and water systems, a water-treatment plant and warehousing facilities.

The hospital will embody many innovations in construction for far northern areas. All footings and foundations will be concrete poured in place on solid rock. The frame will be of concrete and fireproofed structural steel. All walls and floors up to and including the first floor will be of concrete. The second floor will be concrete block covered with two-inch wood siding. Steel stairs and metal lath and plaster interior partitions will provide added fire protection.

UNIQUE FEATURES

The rigours and extremes of the northern climate have necessitated the incorporation of a number of unique construction features. All exterior walls below grade will be heated to avoid frost build-up and along one exterior wall openings will be left between the rock surface and the bottom of the concrete wall to allow the escape of water draining down the heated surfaces. Three layers of two-inch foamed or expanded polystyrene insulation will be placed over the roof slab and down the exterior masonry walls. All windows will be hermetically sealed and no opening vents will be provided, since the entire building will have forced air circulation.

The building will also contain what is believed to be the first hydraulic elevator to be installed in the north. It will feature a full-size finished hospital cab.

Provision is being made for 20 adult beds and eight children's beds. There will be an operating suite capable of accommodating major operations, a maternity section, nursery and insolation wards. A well-equipped out-patient department including consulting and treatment facilities, X-ray, dispensary, laboratory, a dental suite and public health lecture and demonstration areas will be included.

Calling tenders at this time will permit the awarding of the contract in time for the successful bidder to arrange for the shipment of materials in late July or early August. Thus, construction should begin this summer, after the first boats of the 1962 shipping season arrive at Frobisher Bay.

CANADA'S A-POWER PLANT

The reactor in Canada's first nuclear power-station went into operation on April 11. Commissioning of the station is continuing, and the first electricity will be produced within the next few months. Known as the Nuclear Power Demonstration Station (NPD), the plant is near Rolphton, Ontario, about 150 miles west-northwest of Ottawa and 12 miles up the Ottawa River from the Chalk River research centre of Atomic Energy of Canada Limited.

After extensive testing of the complex electronic circuits and various plant systems, heavy water was pumped into the aluminum reactor tank that contains the uranium oxide fuel. A neutron-counting instrument in the station control room indicated that a chain reaction had been achieved.

This meant that the "furnace" or reactor in the power-station was "burning" uranium for the first time. Various commissioning tests will be carried out during the next few months before the reactor is brought up to its full heat output and steam is fed from the steam generator into the turbine-generator unit to produce electricity.

CO-OPERATIVE PROJECT

The \$33 million NPD station was built as a co-operative project of Atomic Energy of Canada Limited, Ontario Hydro and Canadian General Electric Company Limited. The plant, which will have an electrical output of 20,000 kilowatts, is a prototype for larger plants, such as the 200,000 kilowatt Douglas Point Nuclear Power Station now under construction on the eastern shore of Lake Huron, midway between Port Elgin and Kincardine, Ontario.

CGE, under contract to AECL and Ontario Hydro, was responsible for the design, development and construction of the station. AECL provided research and development data for and owns the nuclear portion of the plant. Ontario Hydro designed and owns the conventional portion of the plant. Ontario Hydro operates the station and will pay AECL for the steam fed to the turbine.

DESCRIPTION OF REACTOR

The reactor is an aluminum tank 15 feet long and 17 feet in diameter. Through it run 132 horizontal aluminum tubes into which are inserted zirconium alloy pressure tubes that contain the uranium oxide fuel.

The fuel consists of bundles of zirconium alloy tubes, 19.5 inches long, that contain small pellets of uranium oxide. The outside diameter of each fuel bundle is 3.23 inches. There are 1188 fuel bundles, each containing about 33 pounds of uranium oxide, making a total of about 20 tons of fuel.

When operating at its full heat output, the reactor will contain about 60 tons of heavy-water moderator. The heavy water surrounds the fuel and slows down neutrons (moderates their speed) sufficiently to enable a chain reaction to take place. The chain reaction is a successive splitting of uranium atoms, often termed the "burning" of the uranium, that releases large quantities of heat.

Heavy water is pumped into the pressure tubes containing the hot-fuel bundles. This heavy water,

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