

Design and Construction of Alberta Wheat Pool's Annex No.4

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V.B. Cook Co. Limited is proud to have participated in a project that they believe to be a trend setter in modern, safe and efficient grain storage facilities. On January 22, 1979, the Honourable Otto Lang, Minister of Transport, pushed the control switch to begin grain flowing from Alberta Wheat Pool's Annex No. 4 storage bins which are part of its Vancouver Terminal No. 1. The new annex is both architecturally aesthetic and compatible with waterfront and nearby residential areas. It gives the terminal sufficient reserve storage to allow ship loadout for 10 days if incoming railcar supply was interrupted. Built for maximum safety with numerous precautions against explosions, the 2.8 million bushel annex is completely automated and remotely controlled from a central panel (Fig. 1).

Modern standards of explosion control and venting coupled with innovated design make this annex facility stand among an elite class of grain storage structures. Special venting panels and walls with explosion clips are designed to release in the event of an explosion, preventing excessive build-up of internal pressure. Explosion-proof electrical installations and antistatic conveyor belts reinforce the maximum safety precautions taken. The main elements of fire control include an efficient grain dust filter system, strategically located heat sensors and an automatic sprinkler network (Fig. 2).

Annex No. 4 features a new concept in bin bottom design. The lower level is composed of round reinforced concrete columns which support the bins and steel hopper bottoms (Fig. 3). This level houses the four unloading conveyors and is completely above grade. The arrangement results in an "open basement" with ample ventilation and a spacious interior which is in sharp contrast to the majority of grain storage annexes with their maze of basement walls and congested tunnels. The bins stand 115 ft in height with the circular ones having a 32 ft diameter, and are arranged on a 45° skew in plan. There are 52 in total, including the saddle and interstice areas. The entire tank system consists of approximately 10,000 yd³ of concrete and was slipformed in eight days (Fig. 4).

Both the cupola and link areas were structurally designed so as to minimize dust ledges. Within the cupola at bin top there are three 42 inch belts capable of delivering 30,000 bushels per hour to automatic bin floor trippers. The entire structure is founded on a 5 ft thick foundation slab at grade supported on 178 concrete caissons. Due to its Vancouver location, the Annex was designed for earthquake forces experienced under a Zone 3 seismic region as defined by the National Building Code of Canada.

Fig. 1: Alberta Wheat Pool Terminal at Vancouver, B.C.

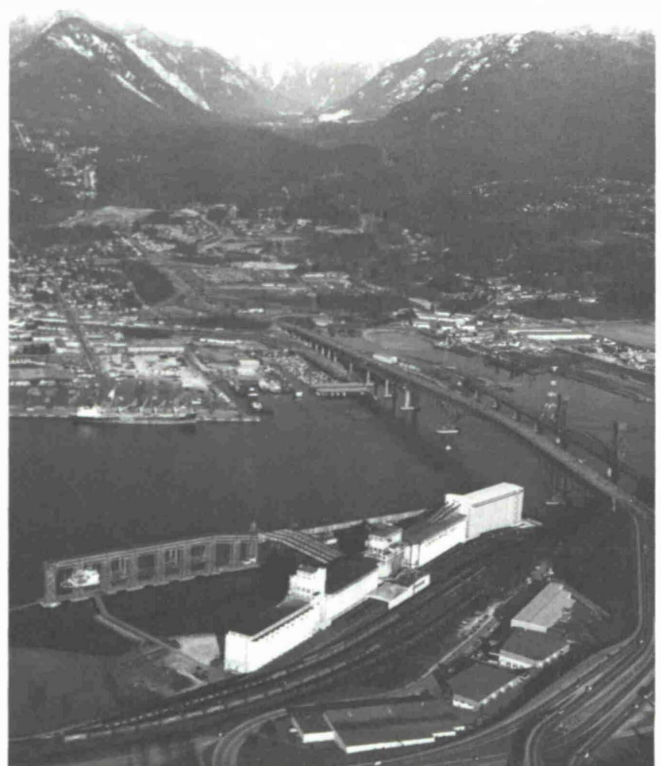




Fig. 2: Alberta Wheat Pool's Annex No. 4 storage bins

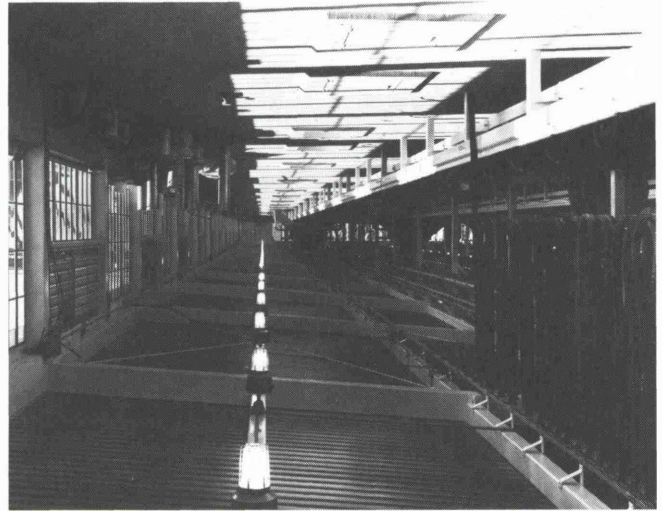


Fig. 3: Draw-off level for the 32 ft dia. bins

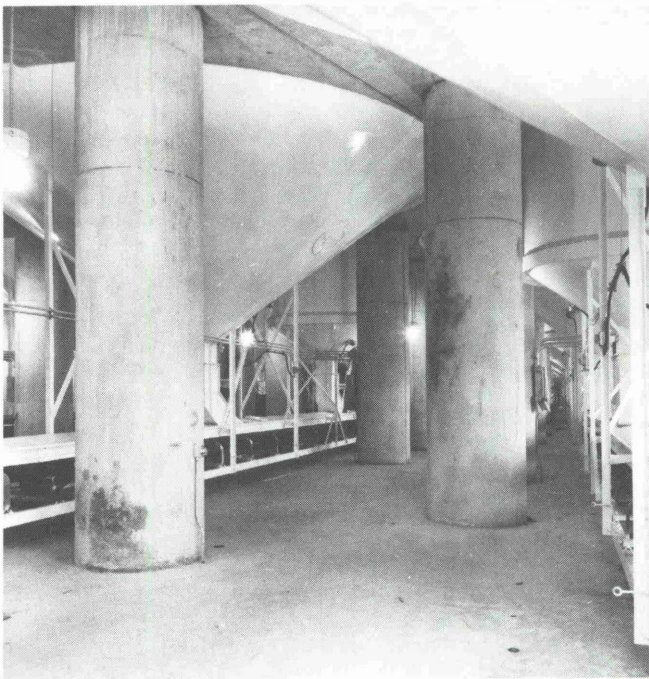


Fig. 4: Bin floor belts and trippers

Alberta Wheat Pool's Annex No. 4 supplies an effective surge capacity to the existing facility and complements the terminal's unloading and shipping capacity. This new annex meets all current and foreseeable environmental and safety standards while combined with other improvements provides a fully modernized high capacity terminal.

V.B. Cook Co. Limited is an internationally established consulting engineering firm providing services that range from preliminary planning and feasibility studies to detailed design and project management.

The Company was incorporated in 1962 and maintains offices in Thunder Bay, Ontario. Our main divisions of specialization — grain, mining and forest products — are complemented by a large staff of engineers and consultants in project management and general engineering. As a group, this team has accomplished major projects in the service of industry, commerce, municipalities, institutions and all sectors of the government.

The firm bears the name of the founder and President, "Jim" Cook, a Consulting Engineer with over 32 years of professional service to industry and commerce.

The practice has enjoyed a steady growth over the years from a small group of professionals to a present staff exceeding 40, of which 20 are professional engineers.