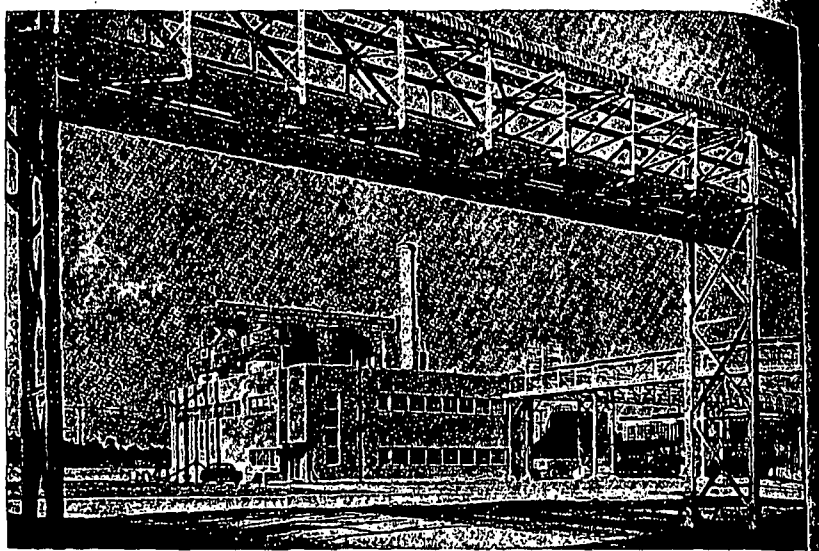


STEEL SUPPORTING STRUCTURE for main manufacturing plant's steam headers frames the coal- or oil-fired boilerhouse

Chemical Plant Builds for Continuity

Modern chemical plants require such heavy capital investments that designers build into them a full range of adequate, well-controlled services. Here's a plant that carries the idea a step farther and guarantees its basic energy needs with large-scale storage and handling facilities for both coal and oil

By PHILIP KRONOWITT, Assistant General Manager, Cibo States, Ltd.

► THE CHEMICAL-PROCESS INDUSTRIES, like all other industrials, find that power services play a continually greater part in final production cost. When our company decided on the new Toms River, N. J. plant, we made every effort to put this condition to greatest advantage. Further, our equipment selection and arrangement point up a desire for flexibility at vital points of the power cycle.

Power-service needs at Toms River run the gamut. They include (1) steam for heating a group of nine buildings in the center of a 1200-acre tract, for chemical-process kettle heating, drying and distillations (2) electric energy for lights, motors, relays, and so on (3) refrigeration for chemical-process cooling (4) air conditioning for offices, laboratories, first aid and cafeteria (5) compressed air for transfer of liquids from one vessel to another and for pressure filtrations (6) inert gas for the transfer of flammable solvents (7) Dowtherm heating for processes that need high temperatures (8) sewage-treatment for purification of all industrial and sanitary sewage before disposal.

Steam Service. Our boilerhouse, photo, above, is a first-rate example of how we planned for ample service facilities with the added advantage of flexibility. We picked two 50,000-lb-per-hr, 500-psi-design-pressure, watertube boilers with waterwalls for pulverized coal or oil firing. These units are semioutdoor with firing aisle, pump room, forced-draft fans within the building and boiler casing, induced-draft fans outside.

We know the 50,000-lb-per-hr capacity stands right on the lower limit of pulverized-coal firing. But we've had a background of successful pulverized installations in other plants, and we anticipate no trouble on this score. Should plant growth require additional boilers we'll go to units double the size of the present ones and more within the normal pulverized-coal range.

Moreover, pulverized firing offers the solid-fuel system most readily adaptable to change-over for oil burning. And this flexibility, we feel, is vital to plant

fuel prices swing with relation to one another. Even more, we want to insure boiler availability no matter how tight the liquid-fuel situation in response to world unrest.

In fact as recently as late 1950, we decided to push the boiler-plant design beyond the earlier 1948-1949 agreement. Then we selected fuel oil for firing with provisions for future pulverized coal. With our 1950 decision, we went ahead and put in a well-integrated coal-handling plant, Fig. 1-5.

Coal Handling. We can now handle all coal mechanically from the time it arrives in hopper-bottom coal cars until we burn it, Fig. 3. This includes delivery to initial crushing equipment, elevating and dumping into storage silos, conveying from silos to the powerhouse.

The coal-handling equipment was installed so the three 330-ton storage silos will be right in the middle of plant expansion. When more power capacity is needed the power plant to house it will be directly opposite the unit now running. So all present facilities can serve this as well as any future power house.

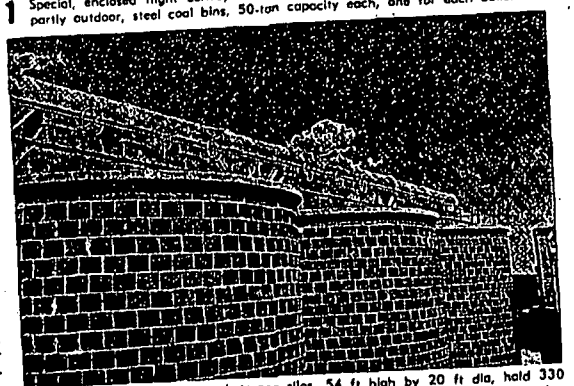
Incoming coal drops through a track hopper, Fig. 3, into underground coal-crushing equipment. From here it travels on a 38-foot-long, 2-ft-wide, trough-type conveyor belt to the elevator-conveyor or round-about conveyor, as it is sometimes called. This round-about design, 276 ft in over-all length and 2 ft wide, doubles in brass. In horizontal travel, Fig. 3 and 4, it acts as a flight conveyor. When traveling vertically, it becomes a bucket conveyor. Fig. 2 shows the conveyor on top of the silos.

If all silos are closed, as in Fig. 3, coal from the round-about conveyor drops onto a chute which, in turn, carries the coal to a flight conveyor for delivery to powerhouse coal bins. This round-about unit can carry the incoming coal directly to silo storage, route it to powerhouse bins, or deliver it from silo storage to the powerhouse.

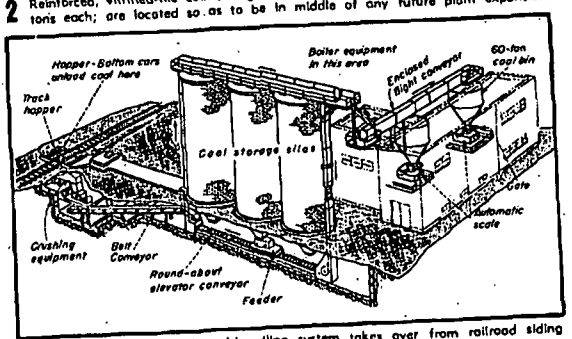
When coal is dumped out of the silo for delivery to the powerhouse we use a special underground feeder-car, Fig. 4. It has a conveyor-belt bottom to feed coal evenly to the round-about conveyor as it passes beneath the car. This car, track mounted, can be pushed easily under any silo. To make the car movement still easier we have spotted wall outlets at numerous points so the car's conveyor motor can be plugged in conveniently.

Figs. 1, 3 show the special, enclosed flight conveyor and conveyor section over the powerhouse coal bins. This 259-ft section can supply either of the 60-ton bins and can do it without develop-

1 Special, enclosed flight conveyor delivers coal, in dust-free fashion, into two, partly outdoor, steel coal bins, 50-ton capacity each, one for each boiler unit



2 Reinforced, vitrified-tile coal-storage silos, 54 ft high by 20 ft dia, hold 330 tons each; are located so as to be in middle of any future plant expansion



3 Completely mechanized coal-handling system takes over from railroad siding through storage silos and carries coal right up to individual boiler hoppers