

Freight Station and Warehouse Has 23 Acres of Floor

Six-Story Structure of Standardized Design Houses L. C. L. Clearing House—First of Industrial Group Interconnected by Tunnels for Trucking

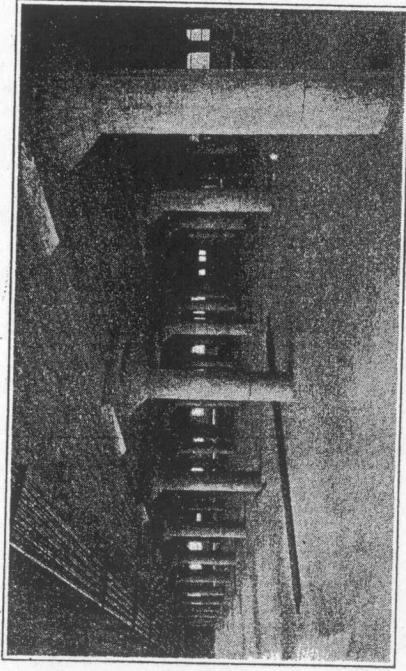
ONE of the largest reinforced-concrete buildings in the world is a six-story combined freight station and warehouse recently constructed in Chicago. Covering a site of 3½ acres, it has nearly 23 acres of floor space. Five upper floors are for storage. The first floor and basement will be used as a central freight station serving not only this warehouse but also a group of about 70 six-story buildings to be erected for industrial and manufacturing purposes. These buildings will average 30,000 sq.ft. for each floor. They will be connected with the freight station by tunnels for trucking, and all pipes, conduits and other utilities will be laid in tunnels. A power-house and cold-storage warehouse already are built.

All the structures are for the Central Manufacturing District, a corporation which owns a similar group of buildings already in use. The construction plant and methods employed at the station and warehouse were described in *Engineering News-Record* of Aug. 9, 1917, p. 267. This one building cost about \$1,350,000, while the cost for the entire group will be approximately \$18,000,000.

The building is 590 x 275 ft. in plan, six stories high, with nearly 20 acres of floor area, or 23 acres including the freight platforms and track space. As the cubic content from 4 ft. below the basement floor to the top of the coping is 13,617,000 cu.ft., the cost per cubic foot is a little less than 10c. Standardization of design and architectural treatment for the entire group of buildings contributed largely to the low cost, owing to the facility of construction and the purchase of material in large quantities at wholesale prices. The struc-

tural materials in this one building include 42,000 cu.yd. of concrete and 2700 tons of reinforcing steel.

Structural design is of the loft type, with circular columns and flat-slab floors and roof. Window areas are large, and are fitted with steel sash. Doors and door frames also are of steel. The structure is fire resistant, and has sprinkler equipment throughout for the protection of its contents. The exterior finish is of dark-red face brick and cream-colored terra cotta;

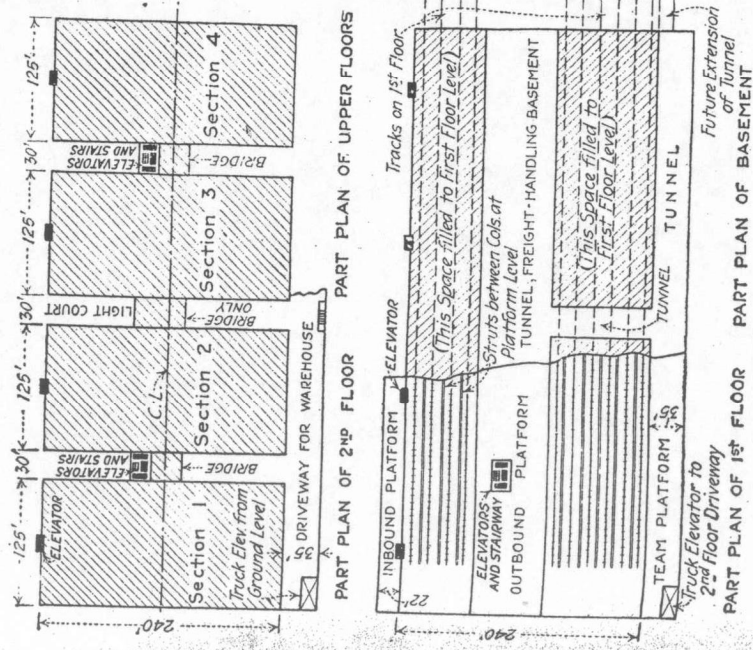


INTERIOR OF ONE OF THE WAREHOUSE FLOORS SHOWS TYPE OF CONSTRUCTION

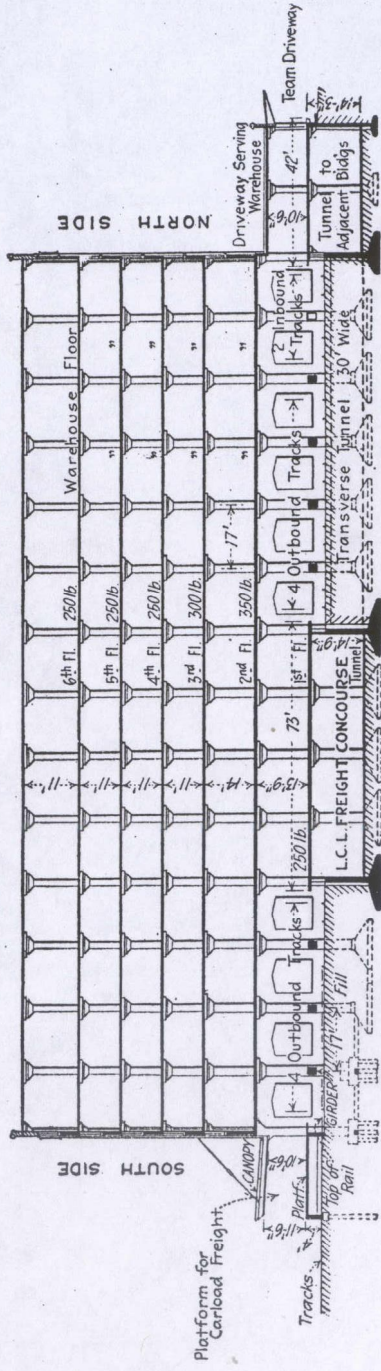
the steel sash and concrete spandrels are painted green. Although the brick facing was not started until after the completion of the roof, it was done in 24 working days. This included the placing of 2,400,000 common brick, 1,000,000 face brick, and 376 tons of terra cotta. This work was done by a force of 300 men. The force on the concrete work for the construction of the building numbered about 900 men.

Column spacing, 17 x 17½ ft., was governed largely by the track spacing on the first floor. A 14-ft. clearance was required for the tracks, and this dimension plus the size of the columns gave 17 ft. spacing, which was also found the most economical spacing for the given loads. The live-loads are 250 lb. for the first floor, 350 lb. for the second, 300 lb. for the third, and 250 lb. for the three upper floors. The interior columns are circular and the exterior columns rectangular, with beveled corners. Between the tracks the columns extend uninterrupted from the footings to the second floor, and these tall lengths are braced by longitudinal girders. The girders are at the level of the freight platforms and serve to support the movable plates or bridges on which trucks are wheeled through the cars.

Floor slabs are finished to stand wear and trucking, but no special hardener was used in the surface. The concrete was made with as little water as possible, and after being leveled in the forms a small addition of cement and sand was spread over the surface. This was worked in by thorough troweling and floating so as to make a hard and wear-resisting finish. The slab thickness is 8½ in. for the 350-lb. load, 8 in. for 300 lb. and 7½ in. for 250 lb. The roof is a 6-in. slab,



GENERAL PLAN OF STATION AND WAREHOUSE FLOORS



CROSS-SECTION THROUGH STATION, WAREHOUSE AND TUNNELS

covered with three-ply roofing bedded in asphalt and having an asphalt top coat. All stairways are of concrete.

The spandrel walls are of concrete, and a feature of the construction is that the pouring of these was left until after the completion of the brick facing of the building. This is said to admit of better alignment of the brick, as it avoids the chipping to fit around pilasters and columns which is necessary where brick spandrels are carried by a shelf poured with or attached to the concrete frame. The arrangement enabled larger window openings to be used. It also avoided the usual necessity of cleaning brickwork from the drippings of superimposed concrete, the brick facing being used only on the vertical strips between the spandrel walls and window openings.

Horizontal rods in the columns projected into the spaces to be filled later by the spandrel walls. Similar bars embedded in the floor slabs had the projecting ends bent upward. In this way the reinforced-concrete walls were securely anchored to the columns and floor slabs already built.

This construction was economical, since an 8-in. spandrel of concrete was considerably cheaper than the 18-in. brick wall which would have been required by the city building code. With this method large openings were left extending from the second to the sixth floor, as shown in one of the accompanying views. This facilitated the work of the crews of the various sub-trades in getting their materials into the building.

The site was vacant land and partly a city dump at 39th and Robey Sts., near the bank of the Bubbly Creek arm of the Chicago River. This arm has now been filled. The foundations are spread footings, except that Raymond concrete piles are used near the creek. Where the old dock line made it impracticable to use these piles, open shafts were sunk for concrete piers. These were carried to hardpan, the bottom shaft being belled out to twice the diameter of the shaft.

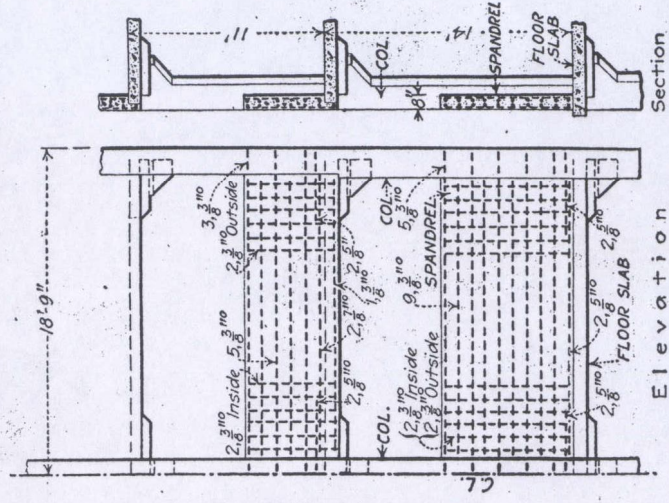
Good blue clay being found only about 4 ft. below the surface, it was economical to strip the entire area with a steam shovel, instead of excavating for individual foundations. This left only about 1 ft. of hand excavation for the footings. The spaces to be occupied by tracks on the first floor were afterward backfilled to the track level.

In the five upper floors the building is divided into four units 125 x 240 ft., separated by 30-ft. spaces, and having light on all sides. These units are connected

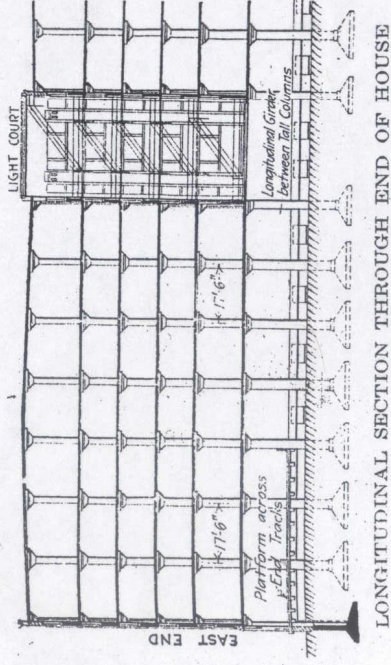
across the 30-ft. open spaces by narrow sections in which are electric elevators extending to the central outbound platform of the freight station on the first floor. This entire upper portion of the structure has been leased to Montgomery Ward & Co. for 25 years for warehouse purposes. There are ten elevators of 5000 lb. capacity, 8 x 12 ft., with speeds of 300 and 400 ft. per min.

Special facilities for access to this part of the building by the lessee had to be provided, as all the street frontage on the first floor is required by the freight station for the receipt and delivery of package freight. A roadway therefore is constructed at the second floor level. This is built over the inbound platform on the first floor, which thus becomes a covered space. The upper roadway is paved with wood blocks. Wagons and motor-trucks have access to it by means of two inclosed 7½-ton electric elevators, one at each end of the roadway.

The collection and distribution of freight for a large group of industries by the central station or clearing-house method is one of the special features of the plant. The first floor will form a union station for incoming and outgoing "less-than-carload" freight or freight in small lots. This station will be 590 x 275 ft. in plan. Beneath the platforms is a basement, which forms the



Section
Elevation
CONCRETE SPANDREL WALLS WERE BUILT AFTER
COMPLETION OF COLUMNS AND FLOOR SLABS



LONGITUDINAL SECTION THROUGH END OF HOUSE

receiving and distributing station for the industries in the group of outlying buildings. It will be connected with these by a system of tunnels extending about half a mile in both directions, and having elevators to serve the several buildings. In these tunnels the package freight will be transported on specially designed trucks hauled by electric tractors.

On the first floor there will be eight stub tracks 550 ft. long for outbound shipments, four on each side of a central platform 70 x 590 ft. Here trap or collecting cars from the several industries will be unloaded, and the contents classified and placed with the package

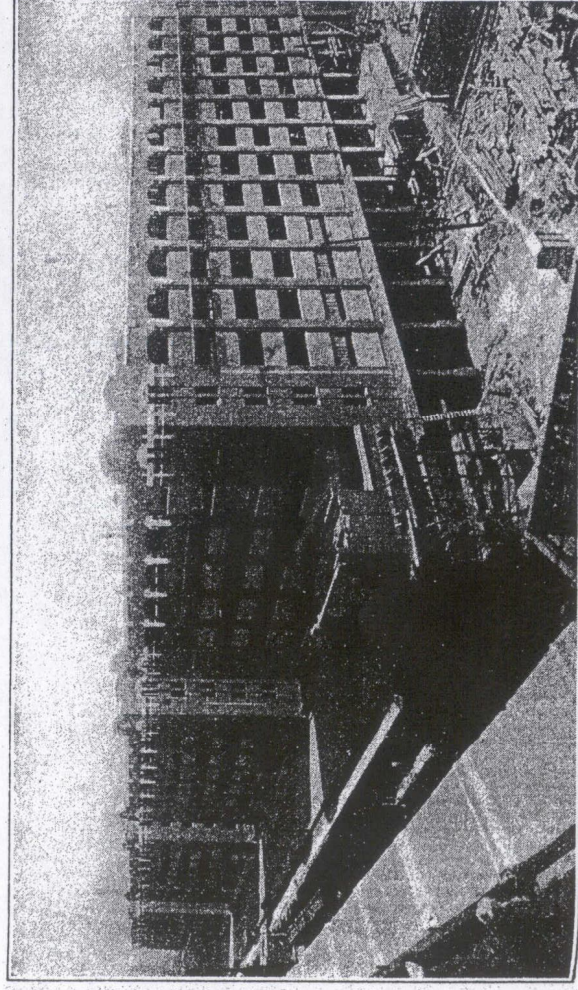
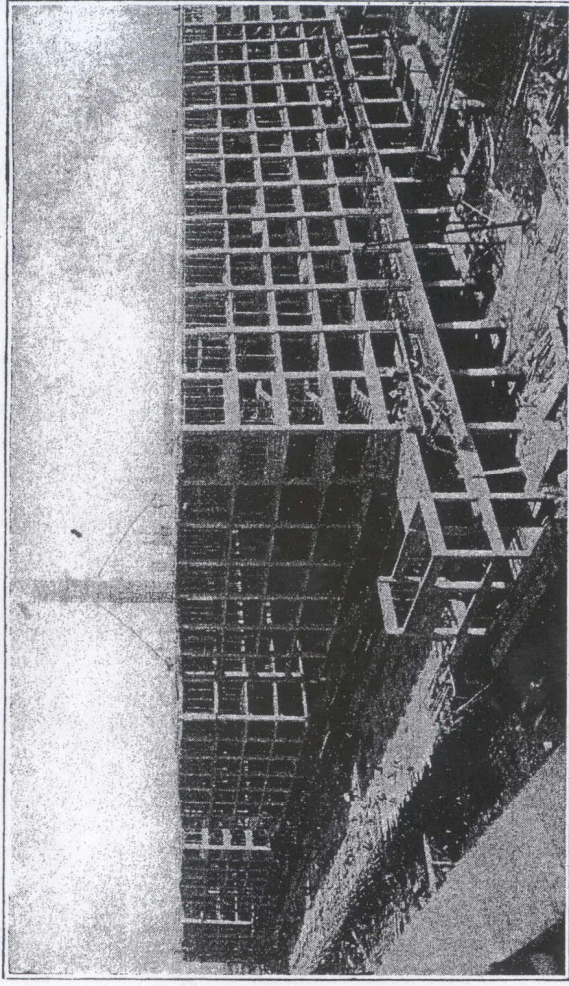
freight received through the trucking tunnels. This outbound freight will then be loaded into cars for shipment. Two stub tracks 450 ft. long are provided for trap cars which bring inbound freight from the stations of the various trunk lines entering Chicago. Here the freight is unloaded to be placed at the disposal of the several industries, or lowered to the basement for distribution by the tunnel trucks and tractors to the group of buildings.

Carloads of incoming freight for the warehouse are accommodated on two tracks 590 ft. long, with a 20-ft. platform having elevators to the five upper floors. Two tracks at grade will extend through the group of buildings and provide for direct handling of the carload business of the several industries. All of the tracks will be operated by the Chicago Junction Ry.

Heat, electric light and sprinkler service for the present structure and the entire group of buildings will be supplied from a central power station. The lighting plant is designed on the basis of 4 watts per sq.ft. for the office sections and $\frac{1}{2}$ -watt per sq.ft. for the remainder of the building. For the water service there is a two-story elevated tank in the tower of the power station. The upper part is for the sprinkler service and the lower part for the domestic service. This

STRUCTURAL FRAMEWORK WITH FLOORS AND ROOF COMPLETED BEFORE SPANDRELS AND CURTAIN WALLS WERE BUILT (VIEW TAKEN

AUG. 2, 1917)



CHICAGO FREIGHT STATION AND WAREHOUSE WITH 23 ACRES OF FLOOR SPACE—NORTH FRONT HAS SECOND-STORY DRIVEWAY REACHED BY ELEVATORS (VIEW TAKEN AUG. 23, 1917)

building and all the others of the group are of the same general type as the freight station and warehouse. The buildings have been designed by S. Scott Joy, architect for the Central Manufacturing District. John L. McConnell is assistant architect. The structural design and all concrete detailing were handled by the Concrete-Steel Products Company as structural engineers. The contractor for the present work is the E. W. Sproul Company.

Illinois Has \$17,000,000 for Road Work in 1918

For road construction and improvement in Illinois during the coming season there is available about \$9,000,000, including the county, state-aid and Federal-aid funds. In addition there is about \$8,000,000 provided by the townships for the maintenance of township roads and bridges. Under the state law the greater proportion of the former amount will be expended in the construction of roads forming continuous routes, rather than laid out in providing scattered sections of good roads.

Pennsylvania Keeps Roads Open for Army Motor Convoy

Work Falls on Maintenance Section of State Highway Department, Which Organized Equipment and Forces Long in Advance

By GEORGE H. BILES

Second Deputy State Highway Commissioner, Harrisburg, Pennsylvania

ANTICIPATING trouble from deep snows, the Pennsylvania Highway Department prepared long in advance to keep open the route that was being followed by the Army motor truck convoy from Detroit and Cleveland to the Atlantic ports. Arrangements were made with the Pittsburgh office of the Weather Bureau to furnish advance information upon which the machinery could be started to prevent a complete blockade. The work was placed under the direction of the maintenance division of the department, and trucks equipped with snowplow attachments were stationed at the larger towns along the route. The work of these was supple-

