Kinzie Street Track Elevation of the Chicago & North-Western, Chicago.

Although there is more or less similarity in all of the Chicago track elevation work, each piece has its own special problems, making some stretches much more difficult than others. The Chicago & North-Western has nearing completion one of the largest and most interesting pieces of this work that has been done thus far. Wells street station, the principal passenger terminal of the road, is north of and just across Chicago river from the retail district of the city. It is also a short distance east of the north branch of the Chicago river. The Galena division of the road, which is one of its three double-track main lines out of the city, runs due west from Wells street station along Kinzie street. A portion of this line extending from Fortieth avenue, near the western city limits, eastward to Sacramento avenue, about two miles, was elevated several years ago. The present work is a continuation of this elevation eastward for 2.4 miles, from Kedzie avenue to Ada street, about two miles west of Wells street station.

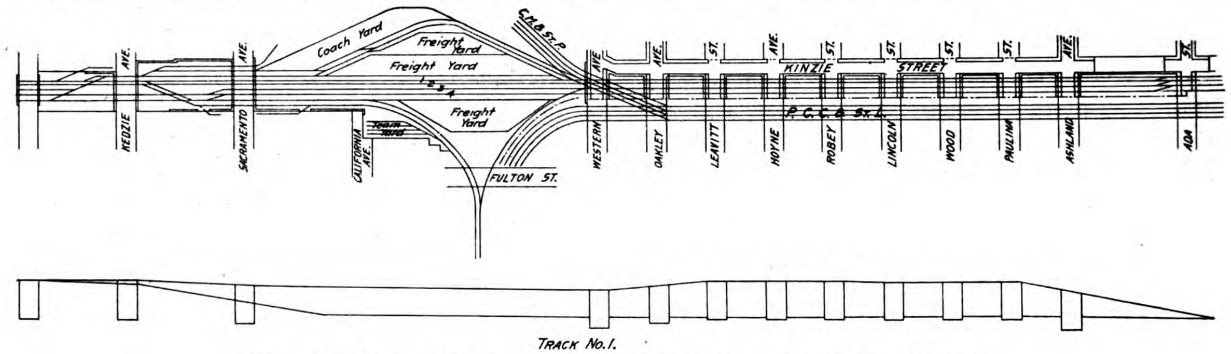

Fig. 1—Sketch Plan of Chicago & North-Western Kinzie Street Track Elevation.

The track and yard situation affecting this work will be understood by reference to the accompanying sketch plan, Fig. 1. Immediately south of the North-Western's tracks are the tracks of the Pan Handle (P. C. C. & St. L.) which come into Kinzie street from the south on Rockwell street. These tracks also are being raised, the work being only a little behind that of the North-Western. At Western avenue the Chicago, Milwaukee & St. Paul comes in from the northwest, crossing over the North-Western to join the Pan Handle tracks, which it uses into Union station. Just west of the C., M. & St. P. junction is the Western avenue freight and coach yard, which also was elevated, though not to the height of the main tracks. An idea of the situation at this point may be gained from Fig. 2. The view is looking west from Western avenue and was taken while elevation of the "north" yard was in progress. Prior to the beginning of the elevation work the main line made a detour southward to run around Western avenue yard, as seen in the photograph, and was separated from it by a high fence. This was to avoid danger from fast passenger trains running through the yards. This has been changed, the line now running directly through the freight yard, but at a considerably higher elevation, dividing it into "north" and "south" yards.

The North-Western formerly had but two main tracks on Kinzie street. It now has four as far east as Ada street, the end of the elevation work. Right-of-way for the third track, which is now the north track, was obtained from the city in exchange for paving, curbing and laying a 5-ft. sidewalk on Kinzie street between Ashland and Western avenues. The fourth or south track was obtained from the Pan Handle in exchange for the site of the old Ada street coach yard of the North-Western, which was abandoned for the coach yard at Western avenue, having double the capacity. East of Ada street there are three tracks to the north branch of the river, where there is a double-track bridge for entrance to the passenger terminal.

Work was begun in the summer of 1904 on the concrete foundations for the retaining walls and footings for the bridge abutments. By the fall of the year the retaining walls were about half built, those from Ada to Robey street being completed all but the coping. The retaining wall work was finished in the spring of the present year and all abutments were built this year. Filling was started in April, the first work being done at Western avenue yard. Filling on the line was begun in May, starting from Oakley avenue and working eastward, one track being raised at a time. The stages of the work are indicated in the cross-section of filling, Fig. 3. Before filling began the north track, which was the first raised, occupied the position indicated by the broken lines almost directly under track No. 2. Sand trains were run upon this track, the material unloaded and used to raise the track, which was lined over into the position of track No. 1 as the raising progressed. Meanwhile a pile-driver went ahead of the filling and drove the piles for temporary subway bridges for the two north tracks. One of these bridges is shown in Fig. 4 with a concrete mixing plant for the column foundations. As soon as track No. 1 was raised it was used as a working track to fill for No. 2, which meantime had been abandoned and was edged up on the side of the fill.

When the bank was ready the rail joints of the track were disconnected and the 30-ft. sections lifted to its top by a derrick car on No. 1 and quickly connected up. It was then used as a working track for the third fill and No. 1 turned over to the transportation department.

The procedure in filling for track 3 was somewhat different from the previous work. In order to avoid encroachment on the north track of the Pan Handle, whose elevation work had not proceeded so far, the track which had been acquired from that road was swung over to the right-of-way line and edged up as shown in Fig. 3 and in the photographic view, Fig. 5, to hold the bank within bounds. Track 3 is therefore a new track. No. 4 could not be put in position until the Pennsylvania had elevated its north track.

Western avenue yards contain approximately 12 miles of track. As already mentioned, these yards were not raised to the full height of the line tracks, the total elevation of which was about 13 ft. The yards were raised 6 ft. above their former grade, the relation of yard and line tracks being as shown by the cross section in Fig. 6. This drawing shows the track plan of the elevation work west of Oakley avenue. To raise the yard, one-half was abandoned and filled at a time. Alternate tracks across the yard were raised at one time, the sand cars being placed on the tracks between.

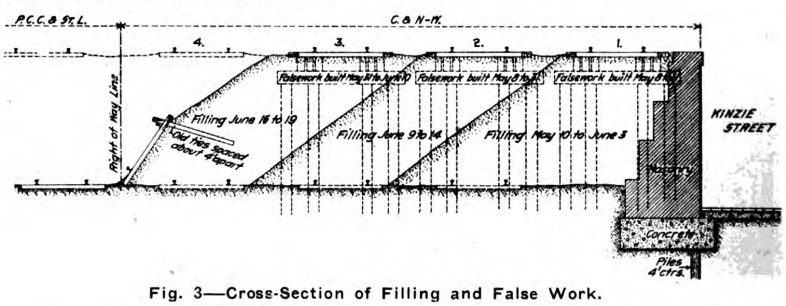

Fig. 3—Cross-Section of Filling and False Work.

In addition to what has been described, the double track from the west which swings southward on Rockwell street has been raised for about three-quarters of a mile. This track runs to Wood street freight yard and the Union Stock Yards. The interlocking plant protecting the junction of this line with the main line, which was formerly at Talman avenue, has been moved west to Kedzie avenue, and is an all-electric plant.

Raising the four-track grade crossing of the Chicago, Milwaukee & St. Paul at Western avenue was a difficult feature of the work. In order to enable this to be done most conveniently, this crossing was moved temporarily to a point east of Hoyne avenue, where the tracks were already elevated. The C., M. & St. P. used the two north tracks of the North-Western west of Hoyne avenue while the crossing was in a temporary position. As soon as the tracks had been raised at Western avenue the crossing was moved back

Digitized by Google
Original from PRINCETON UNIVERSITY
Generated for Jon R Roma (University of Illinois at Urbana-Champaign) on 2014-09-26 15:1 GMT / http://hdl.handle.net/2027/njp.32101049000035
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

to its original position. This crossing will be protected by an all-electric interlocking plant.

Sand for the elevation work was obtained from Cary pit, about 38 miles northwest of Chicago on the line to St. Paul. The Track Elevation department had its own train service over this portion of the line, with special locomotives and cars assigned to it. Haskell & Barker side-dump cars were used and all sand was handled at the Chicago end by shoveling at a cost of about 5 cents a yard. The maximum amount of sand deposited in a day was 12,000 cu. yds. and the average was 7,000 yds.

The retaining walls are built of coarse rubble masonry on a foundation of concrete resting on piles. The coping is Wisconsin red sandstone, the body being gray limestone. A cross section of the wall is shown in Fig. 3, and a photographic view in Fig. 8, which was taken at Western avenue, looking east, before filling began. The concrete retaining wall of the Pan Handle appears on the south side.

The abutments for the subway bridges, of which there are nine new ones, are of dimension stone, and the sandstone is used for bridge seats. The column foundations have a concrete footing with a stone cap. The subways are all 66 ft. between abutments. The bridges, which are now being placed, are steel, and a novel floor construction is employed. Drawings are shown (Fig. 9) from which it will be seen that no longitudinal girders are used. The steelwork of the floor consists of longitudinal troughs resting on the abutments and on transverse girders riveted to the columns. The latter are built up of four Z bars riveted to a central web plate, forming an H section. The cross girders are 3 ft. 8⅛ in. back to back of angles. The troughs are 15⅝ in. wide c. to c. of web plates. They are 12¼ in. deep over angles for the sidewalk spans and 18¼ in. for the roadway spans, the lengths being respectively 11 ft. 3 in. and 24 ft. 6 in. The insides of the troughs are swabbed with hot asphalt and they are then filled with 1-3-6 concrete. Over this is laid 1⅛ in. of asphalt mastic, on top of which is a covering of 1-2-4 reinforced concrete, using ¼-in. corrugated steel bars laid 6 in. on centers. The ballast is laid on the concrete.

The floor drains from the center each way to the ends, the side gutters, formed in the floor, having a zero depth at the center of the bridge and increasing to 6 in. at each end. Drain tiles back of the abutments, under the ballast, carry off the water. At the side of the bridge is a facia girder 2 ft. 11 in. deep. These bridges are designed for a live load of two 177½-ton locomotives followed by a uniform load of 5,000 lbs. per foot of track. There is no allowance for impact because of the ballasted floor. The Pan Handle will use a similar design for its bridges, but which will, of course, be independent of those of the North-Western. The opening between the bridges at the dividing property line will be covered by reinforced concrete slabs, as shown by the detail.

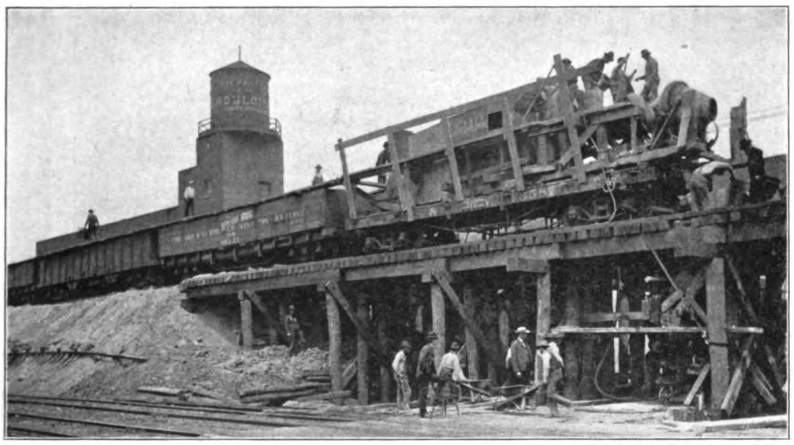

Fig. 4—Temporary Timber Subway Bridge and Portable Concrete Mixing Plant for Column Foundations.

In addition to the nine new subways, the old subway at Sacramento avenue, near the west end of the work, will be revised. It was built in 1893 before any elevation work was done, and was altered in 1895 at the time the western portion of the line now being raised was elevated. It was a skew subway, there being an offset of 17 ft. in the avenue between the north and south sides of the tracks. The lowest point of its roadway was 8 ft. below its present grade. This was below the grade of the sewers and water was constantly present, although an automatic pump was installed to keep it pumped out. This subway has been straightened, a new bridge built, and the roadway raised to give the minimum subway clearance of 13 ft. To straighten the roadway, 17 ft. was acquired by the city on the east side of the street north of the right-of-way. The roadway will have two kinds of paving. On the east 20 ft. granite will be used for heavy teaming. The west 32 ft. will have brick for boulevard purposes. The two will be separated by a concrete curb which will be made of crushed granite to give greater durability. On each side of the bridge it will be 9 in. x 30 in. Under the bridge it becomes a wheel guard and a support for a row of columns. It has a foundation 6 ft. wide and 21 in. deep. The upper part is 3 ft. wide for a height of 3 ft. 8 in. and the remaining 2 ft. tapers to a top width of 1 ft. 4¾ in. Details are shown in Fig. 7. The 17 ft. on the west side, north of the tracks, which formerly was roadway, will be sodded.

Fig. 5—Track No. 4 Edged Up on Side of Fill to Protect Adjacent Tracks of P., C., C. and St. L.

Before the elevation work began there were viaducts over the tracks at Ashland and Western avenues, with truss spans of 190 ft. and 140 ft. respectively. These had to be removed by the railroad companies, which also removed the approaches. The North-Western removed the north approach to the Ashland avenue viaduct, the C., M. & St. P. the similar approach at Western avenue, and the Pan Handle the two south approaches. In addition a 250-ft. span bridge which carries the Metropolitan Elevated Railway over the tracks, had to be raised about 10 ft. This was done by jacking up the end bearings, building up the abutments, and changing the plate girder approaches, all of which was done by the Elevated Railway.

Before the work began there was a passenger station at Oakley avenue. This was abandoned and a new station is being built at Kedzie avenue. It is a one-story building with basement rooms at the street level. The general waiting room, which is at the track level, is 72 ft. x 40 ft., and there are also women's rooms and a smoking room. The material is continental brick with Bedford stone trimmings. The platforms are wood, except over the subway, where concrete is used. There is an inclined driveway of concrete leading up to the waiting room level from Carroll avenue. It opens into an area adjoining the station, also of concrete, which gives standing room for the carriages.

The estimated amount of filling material is 505,000 cu. yds. There were 4,000 yds. of first-class masonry work in the abutments, 17,000 yds. of second-class for the retaining walls, and 15,000 yds. of concrete in the work. There are about 5¼ million pounds of steel in the subway bridges. The improvement of Kinzie street required 15,000 sq. yds. of paving, 3,500 sq. yds. of cement sidewalk and 8,000 lineal feet of curb. Excavation for the sub-

Digitized by Google
Original from PRINCETON UNIVERSITY
Generated for Jon R Roma (University of Illinois at Urbana-Champaign) on 2014-09-26 15:1 GMT / http://hdl.handle.net/2027/njp.32101049000035
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

Generated for Jon R Roma (University of Illinois at Urbana-Champaign) on 2014-09-26 15:1 GMT / http://hdl.handle.net/2027/njp.32101049000035
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

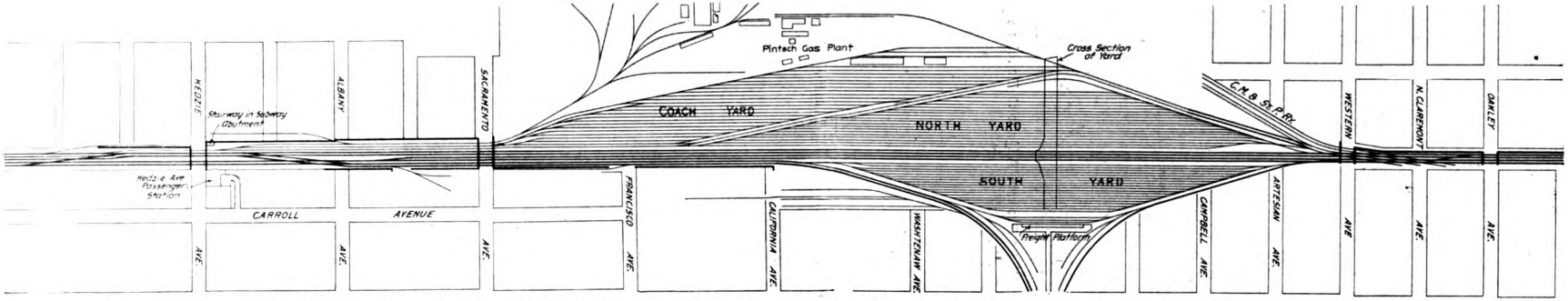

Fig. 6—Track Plan West of Oakley Avenue, Showing Western Avenue Freight and Coach Yard, C., M. & St. P. Crossing and Kedzie Avenue Passenger Station.

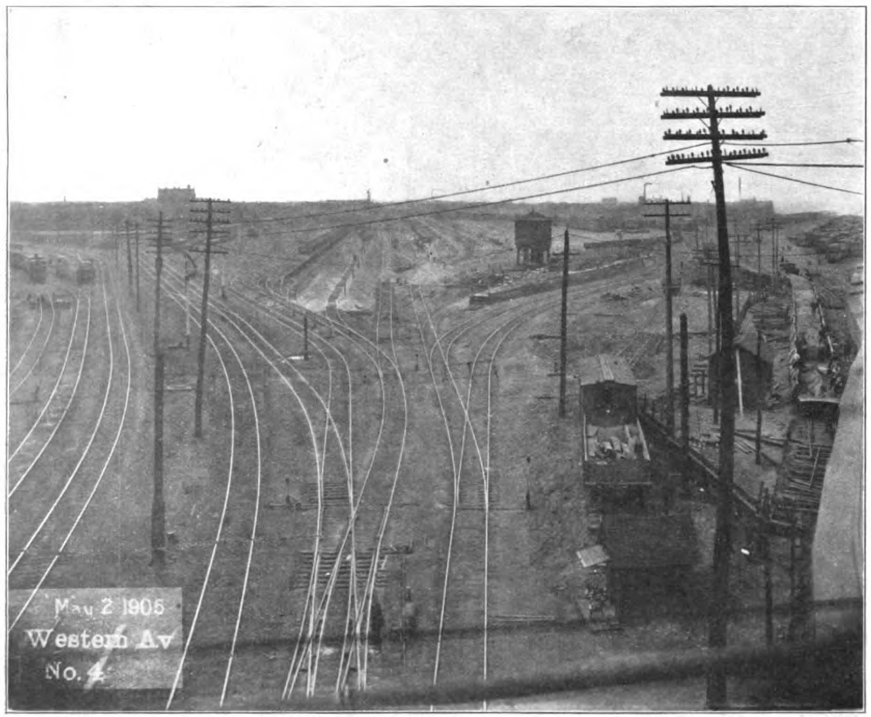

Fig. 2—Looking West from Western Avenue Before Filling Was Begun.

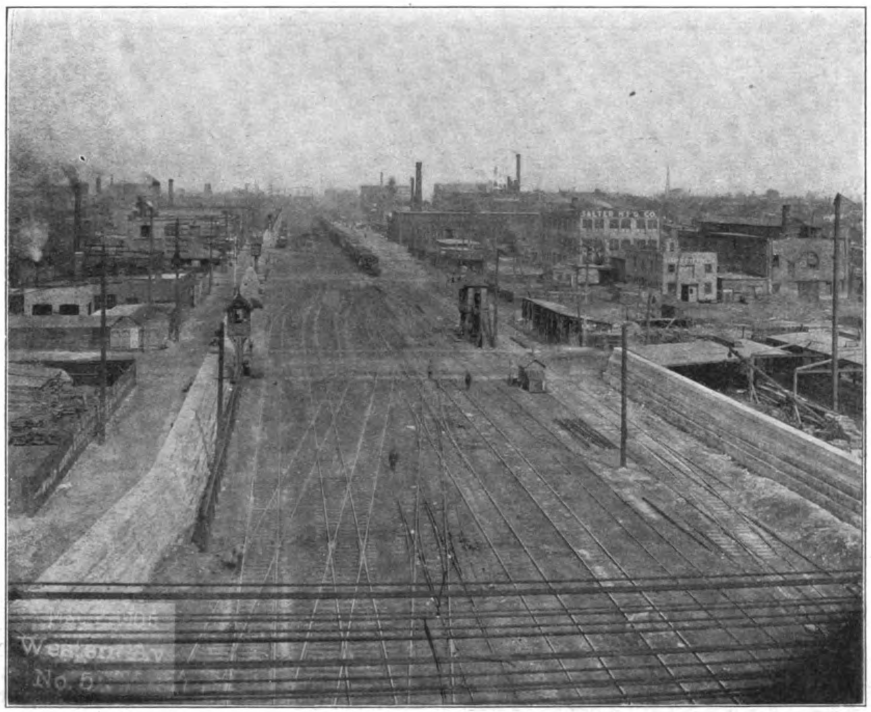

Fig. 8—Looking East from Western Avenue Before Filling, Showing C. & N.-W. Retaining Wall on Left and P., C., C. & St. L. Retaining Wall on Right.

Digitized by Google
Original from PRINCETON UNIVERSITY

ways amounted to 7,500 cu. yds. and there were 15,000 yds. of material in the north approach to the Ashland avenue viaduct. One mile of sewer was laid in Kinzie street to replace a sewer on the line of the retaining wall. It varied from 2 ft. to 4½ ft. in diameter, increasing by 6 in. every 1,000 ft. At Ashland avenue a 24-in. water main running north and south, a 12-in. east and west main and a 6-in. north and south main were all lowered about 4 ft. under pressure. East of Ada street, where the elevation work ends, the tracks are being rearranged and laid with heavier rail. Also, an interlocking plant is being put in to protect a team track yard at Green street. The estimated cost of the track elevation work, not including the Kedzie avenue station, is $1,400,000.

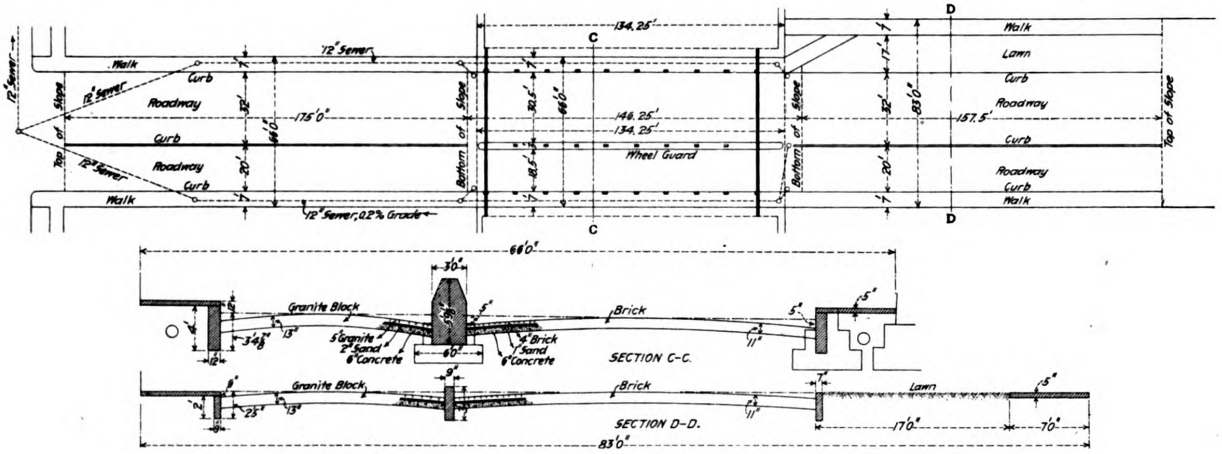

Fig. 7—Roadway Plan and Cross-Sections at Sacramento Avenue.

A very heavy traffic over this line had to be taken care of with minimum delay while the work progressed. Besides through and suburban trains, there was some freight traffic, and numerous light engine, empty train and switching movements. There was also the Western avenue crossing of the C., M. & St. P. The abandonment of Ada street coach yard required all empty passenger trains to be moved over the stretch being elevated in going to and from Western avenue yard. As the tracks were raised traffic had to be shifted from one to another, requiring constant changes in switches, signal connections, etc. Two tracks were kept open for traffic except from 10 a.m. to 4 p.m., when only one track was used, which was controlled by operators at Ada street and Western avenue respectively. While Western avenue yard was being raised a part of its work was transferred to the Fortieth avenue yard.

The entire work is being done under the direction of Mr. E. C. Carter, Chief Engineer of the Chicago & North-Western, assisted by the engineers of the track elevation department, immediately in charge of the work. Mr. J. A. Peabody, Signal Engineer, has charge of the signaling and interlocking work, and Mr. J. S. Robinson, Division Engineer, of the passenger station at Kedzie avenue. All work was done by company forces except the street improvements, and Kedzie avenue station, which were done by contract.

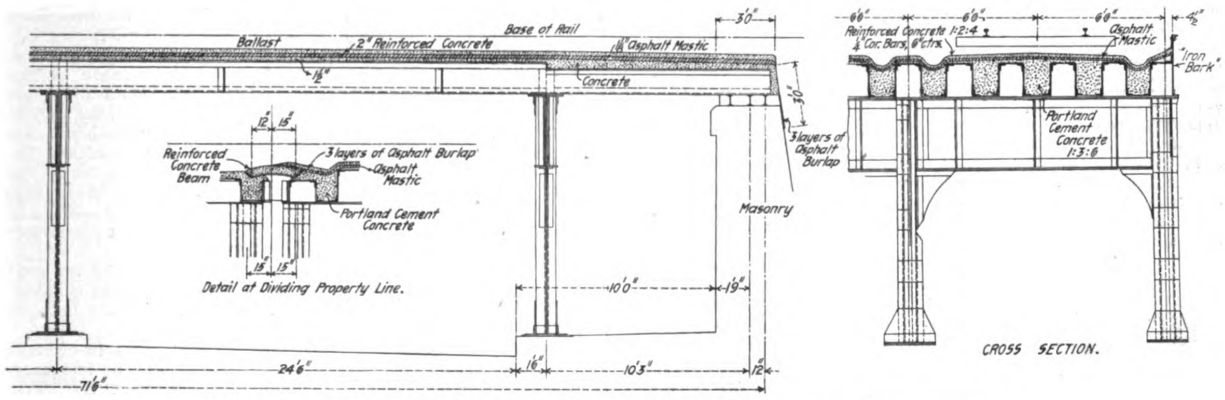

Fig. 9—Typical Solid Floor Bridge Construction on Kinzie Avenue Track Elevation.

Hearing on Freight Train Braking.

At Washington, November 2, the Interstate Commerce Commission heard the remonstrances of those railroads which object to an increase in the minimum percentage of cars to be controlled by power brakes in freight trains, the law at present requiring 50 per cent., and authorizing the commission to increase the minimum. The first remonstrant was the Pennsylvania Railroad. This company reports for six months an average of 75 per cent. braked in all of the freight trains run by the company; but 20 per cent. of all of the trains run had less than 70 per cent. braked and about 5 per cent. of the trains had only 50 per cent. braked. General Superintendent Creighton said that the classes of cars in which there are the fewest air-braked cars are those used in the coke and the anthracite coal traffic. These are largely old cars which it would be uneconomical to fit with air-brakes. In the anthracite region old cars have to be used because the loading facilities are not adapted to the new high-capacity cars. In the month of August the Pennsylvania ran 12,859 freight trains in which were 476,742 cars, of which 328,895 had air-brakes which were in use. This is equal to 70 per cent., or 5 per cent. less than the average for the six months reported above.

To comply with the present minimum legal requirement of 50 per cent. causes some delays, cars of coke having to be held 12 hours, sometimes, to properly make out a train. Delays like this would be made necessary in all of the yards if the minimum percentage were raised, and such delays would be especially costly at the present time on account of the great volume of traffic. The company is using every car available, and of box cars and gondolas could just now use as many more if it had them; in other words, the amount of business offering is twice as great as the company can accommodate. To take the old cars out of service for the purpose of fitting them with power brakes would temporarily deprive shippers of that much accommodation.

The Pennsylvania Lines West of Pittsburg (and, indeed, all of the large roads which appeared) made statements similar to that of the Pennsylvania. These lines own about 4,000 rack coke

Digitized by Google
Original from PRINCETON UNIVERSITY
Generated for Jon R Roma (University of Illinois at Urbana-Champaign) on 2014-09-26 15:1 GMT / http://hdl.handle.net/2027/njp.32101049000035
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google