

Laying in New Junctions for Kent Coast Electrification

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Scene at Shortlands on September 7, 1958, with the up and down fast lines broken for slewing. Switch and crossing work is proceeding in the distance

THE track layout between Shortlands Junction and Bickley Junction, on the Southern Region main line from Victoria to Dover and Ramsgate, *via* Chatham, formerly consisted of four electrified tracks, with parallel working of two down lines and two up lines. The paths of up trains cut across the path of down trains, and there was the added disadvantage that the two outside tracks had very sharp curves through the platforms at Shortlands, Bromley South and Bickley stations, involving permanent speed restrictions of 30 m.p.h. The two centre tracks (fast lines) had a 40 m.p.h. speed restriction at Shortlands Junction, and 20 m.p.h. through the Catford Loop lines. Bickley, Petts Wood and St. Mary Cray junctions carried speed restrictions of 20 m.p.h., and 30 to 35 m.p.h. on the loops joining them.

The proposals for modernisation in this area consisted of reversing the lines to up and down fast and up and down slow alternate lines, and the easing of the curves through the platforms allowing 60 m.p.h. All junctions had to be altered to fit this layout, and many new connections installed; the platforms and canopies had to be altered to the new alignments; and Bromley South Station modernised with lengthened platforms, and a new footbridge. Practically all new intermediate junctions are laid for 40 m.p.h.; at the new junction at Shortlands where the two Victoria lines fan out to four lines, the permissible speed is 60 m.p.h. The up and down loops from Bickley Junction to Petts Wood Junction are laid for 50 m.p.h., including the junctions, and the up and down loops from Chislehurst to St. Mary

Cray Junction are laid for 40 m.p.h.

This work involved big earthworks, carried out in most unfavourable weather, and the construction or reconstruction of 16 bridge spans and the removal of ten bridges. The junction work involved 49 pairs of switches and 123 crossings (including several switch diamonds and two pairs of "G" type switches with cast manganese 1 in 24 crossings). Beyond Bickley Junction on the route to North Kent, the two tracks have been increased to four as far as Swanley.

The track formation in the whole area of the Bickley-Chislehurst loops and in the cutting to St. Mary Cray Station is on London Clay, which has given considerable track troubles in the past. The new formation has, therefore, been blank-

reversible running between East Croydon and South Croydon, and major track alterations in the running lines in connection with new carriage facilities at Hither Green. It was, therefore, possible to programme the works as follows:—
Bromley South : June to December, 1957 ;
Bickley Station : March to April, 1958 ;
and Shortlands : May to October, 1958.

For the work in the Bickley Junction, Chislehurst loop, Petts Wood and St. Mary Cray area, a separate meeting was held by the District Engineer on April 1, 1958, with the operating and signal representatives, and a second meeting was held on April 11, 1958, with the bridge contractors. These first meetings indicated that, unless abnormally long track possessions were granted, the target

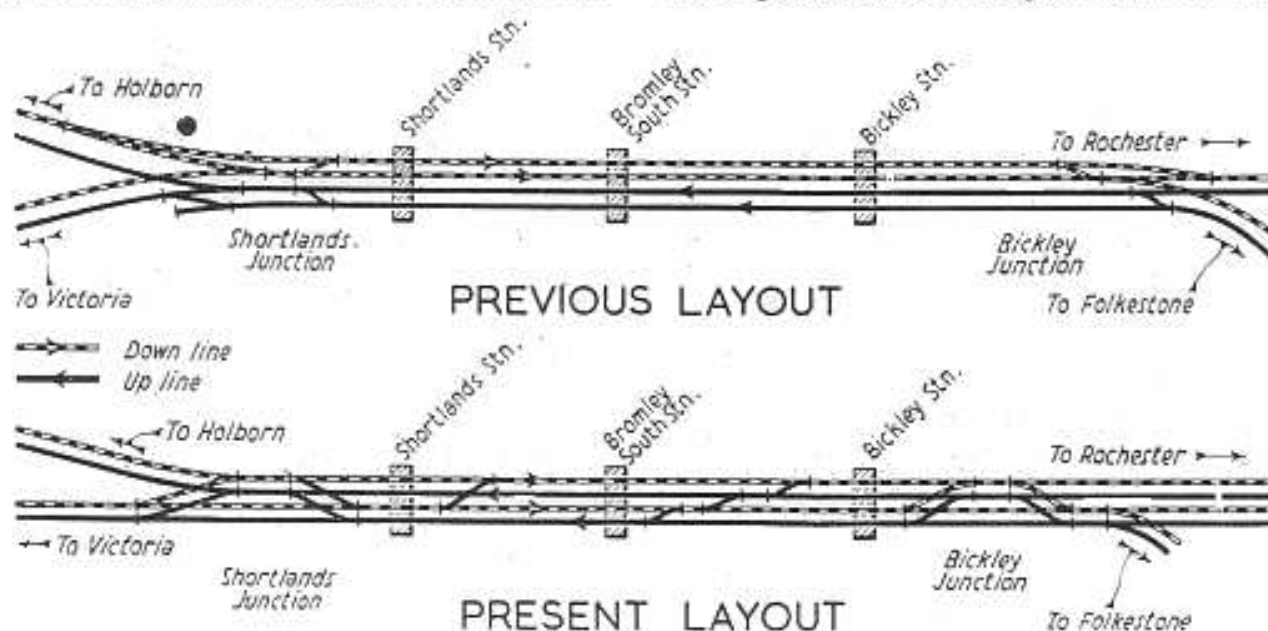


Diagram of the old and new four-track layouts between Shortlands Junction and Bickley Junction

eted to a depth of 3 ft. below the undersides of the sleepers with 2 ft. of stone dust, and the track ballasted on 12 in. of stone to provide for high-speed running.

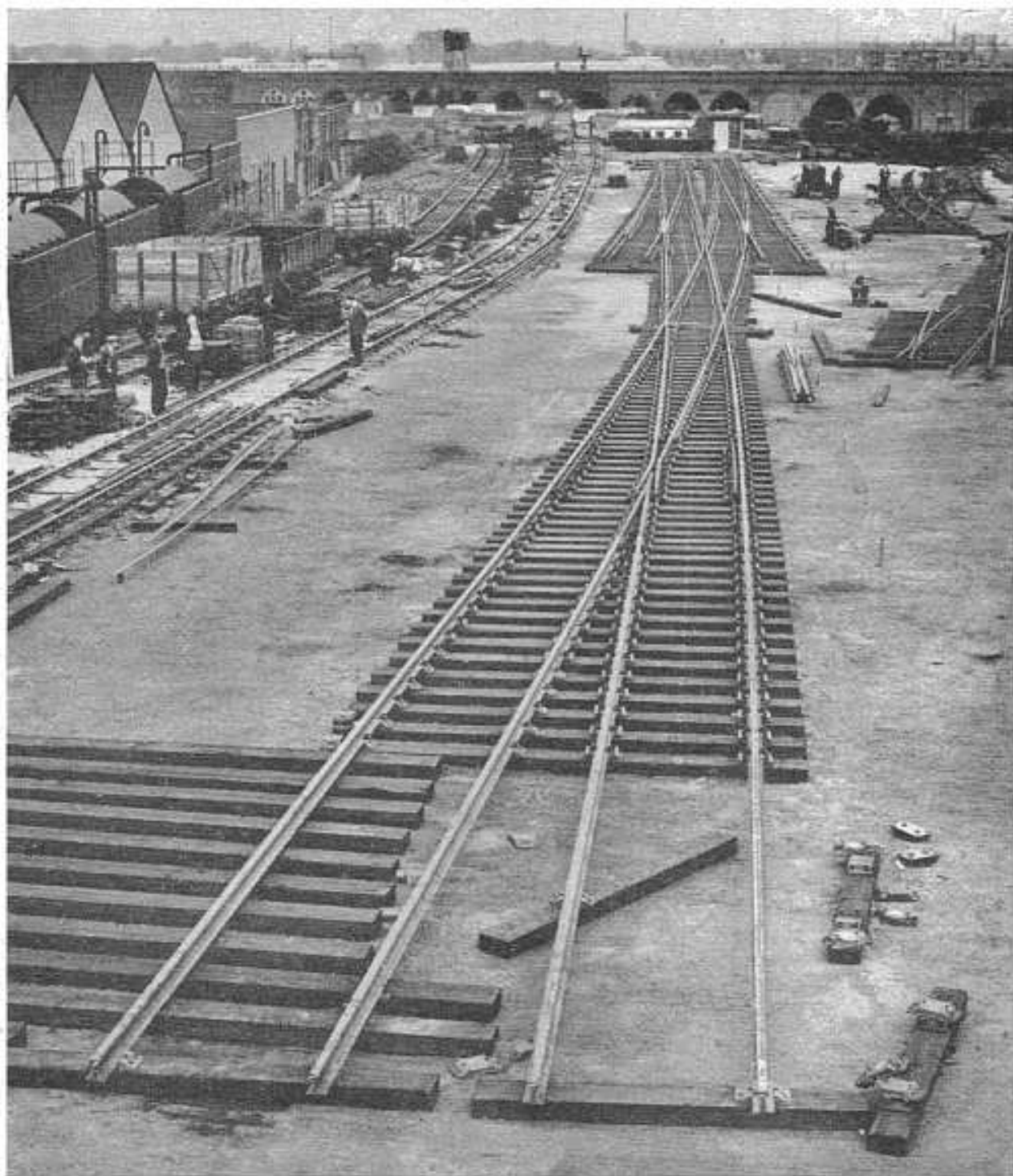
The target date for opening all the new lines was known to be June, 1959, and, after authority to proceed had been given on the small-scale submission plans, the first stage was to co-ordinate the permanent way programme to the earthworks and bridge programme, and to ascertain if the target date was even a possibility. The work had to be programmed in relation to other works on the London (Eastern) District, such as platform extensions for 12-car trains at Charing Cross, Cannon Street, Waterloo (Eastern), Purley, and London Bridge (Central), and

date was not possible. The operating representatives agreed to long possessions, and the co-ordinated programme was prepared involving laying junctions and constructing bridges, throughout every weekend from October, 1958, to May 30/31, 1959. Under the heading of programming also came the detailed arrangements for possessions of track agreed at three-monthly intervals at meetings between the operating, engineering, and signal departments. These were finalised every week, one month ahead, for publication in the weekly engineering notice in which were shown the temporary speed restrictions, the possessions of track and any special notices, such as signal alterations, new

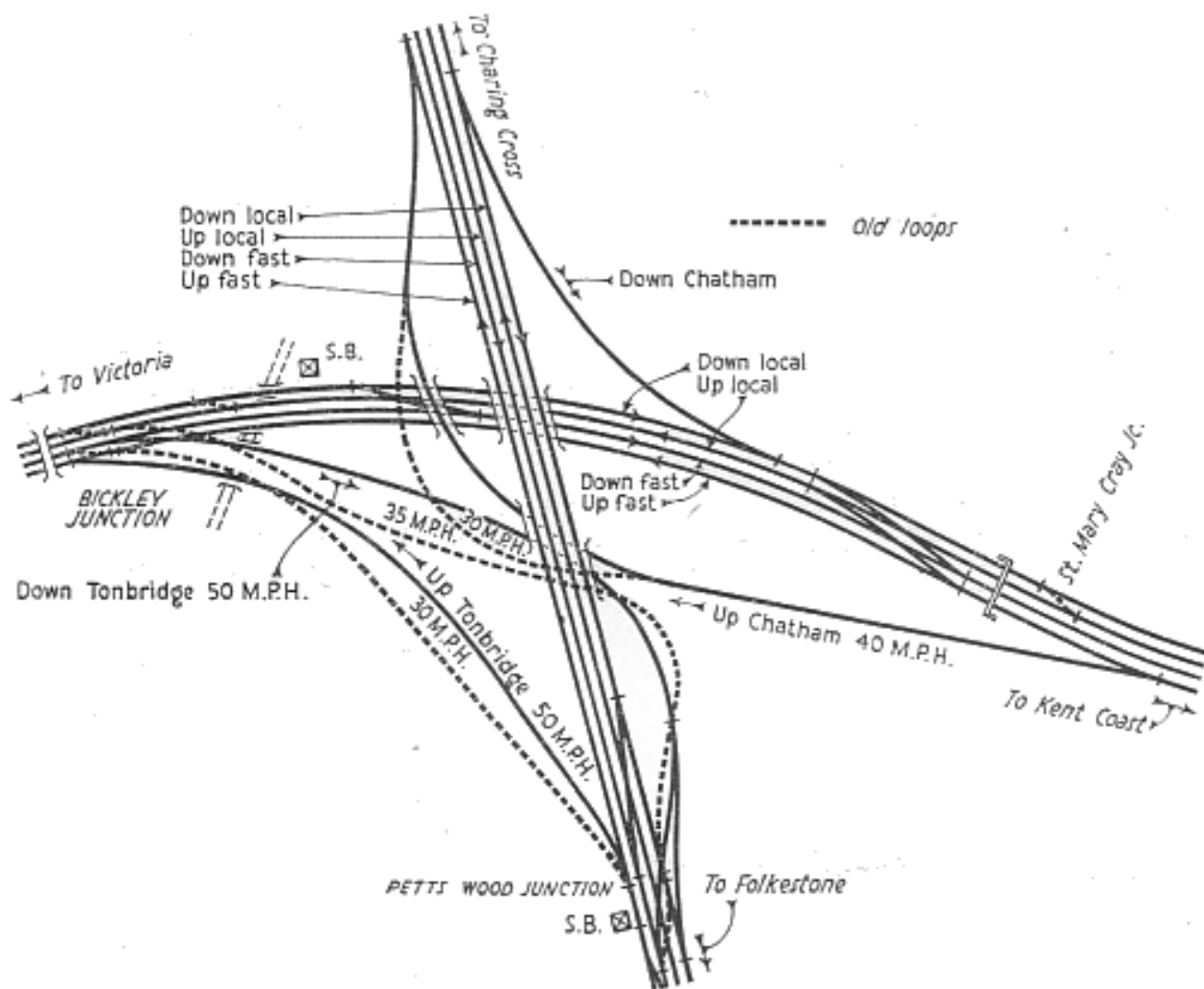
layouts, and so on, for the information of all concerned, but particularly for drivers and motormen. Separate arrangements were made, and notices published, regarding the running of ballast and material trains, including trains necessary to convey cranes of 10 and 36 tons capacity to the site.

Large-scale surveys of the junction sites were made by the technical staff, and the necessary calculations, design and detailed drawings produced by the engineering department to which the signal department added its requirements for

insulation for track circuits. From these details, indents were prepared listing all the materials needed such as 12 in. \times 6 in. timber from 8 ft. to 30 ft. in length, rails, fishplates, fishbolts, ordinary and special two-level baseplates, coach screws, "T" screws and clips, switches and crossings, and electric track requirements. These materials were supplied through the Chief Civil Engineer, and the switches and crossings manufactured at Redbridge Depot, near Southampton. This work was additional to the normal renewal programme, which also had to be supplied,



The new Shortlands Junction being assembled in the layout yard at New Cross Gate permanent way depot



The remodelled loops at Bickley Junction, showing the old connections

and constituted a very heavy load on this depot. All materials had to be delivered to the District Engineer's layout depot at New Cross Gate.

At the layout depot, a sub-inspector and 21 men were employed in fabricating the junctions, which were set out from a base line on the layout ground and a similar base line at the site of the work. The switches, crossings, timbers, and rails were all cut to fit and laid to correct curvatures, with the use of a 10-ton and a 6-ton crane. They were then marked with paint, and broken down into convenient sections for loading on "Bo-Rail" wagons for despatch to the site in time for the track possession. The layout ground will take two junctions each 400 and 500 ft. long, and while the layout is in the depot, the signal department linemen fit as much of the signal gear as possible. As many as ten or 12 trains left New Cross Gate on Saturday evenings, and these, together with trains for other works, placed a heavy load on the operating and motive power departments to find crews.

At Shortlands, the alterations involved 23 major permanent way stages interlaced with several possessions for the reconstruction of the bridge over Beckenham Road involving new steelwork under three tracks. Moreover, the Bickley Junction and Chislehurst loop area involved 44 permanent way stages for switch and crossing work, plus many major possessions for 11 bridge spans and a great deal of week-night possession work for laying some eight miles of plain track and approximately twelve miles of conductor rail.

Careful planning was needed beforehand for the technical staff to set out alignments and levels, and the permanent way supervisory staff to measure in the new switches and crossings from the large-scale drawings for correct fabrication in the layout yard. The Chief Permanent Way Inspector had to make detailed arrangements for the large number of men required, always bearing in mind other calls on the district manpower for maintenance, and the correct requirements of ballast and trains for

each stage, and the allocation of the necessary cranes.

Extended possessions usually lasted from midnight on Saturday until 10 a.m. on Sunday although some of the major operations required 24 hours and even 30 hours. Stage 15 at Shortlands was typical of a long weekend. This site consisted of four lines at varying interval spacing, one of which, the up slow line, was already in position; the other three lines had to be lifted, mostly beforehand, by amounts varying from 1 ft. to 2 ft. 6 in.

On the weekend September 6/7, 1958, the three lines had to be slewed into new positions over a half-mile length, involving a maximum slew of approximately 4 ft. to the down slow line, and lesser amounts to the two fast lines. The existing double-line junction to the Catford Loop had to be removed, and replaced with a new fast-running junction, including switch diamonds, ready for reversed running, and a temporary crossover installed to enable trains to run through the junction for the existing direction of the tracks. Two 60-ft. bridges had to be slewed 1 ft. 6 in. to accommodate the new alignment.

Permanent way men were in the signal-boxes to take possession of all tracks at

10 p.m. on Saturday, September 6, and electric track linemen were in position to arrange with the electrical control department to isolate the current from the tracks. Material trains were approaching the site, and on taking up possession of the tracks they were positioned as follows:—

Train No. 1: Arrived *via* the main line, with steam crane No. 56, one rail wagon, three ballast wagons and three hoppers. It was positioned on the up slow line to lay in the new temporary crossover previously unloaded in the midway. It was shunted to the up main line at 6 a.m. to continue work.

Train No. 2: Arrived *via* the Catford Loop, with four loaded and two empty rail wagons and steam crane No. 1723. It was positioned on the down Catford Loop line to pull out the old junction and lay in the new fast running junction and switch diamonds. At 6 a.m., the crane shunted to the up line under its own power, and the train shunted to the up Catford loop *via* Ravensbourne.

Train No. 3: Arrived *via* Beckenham Junction from the Mid Kent line, with steam crane No. 1579, four empty, two loaded rail wagons and four hoppers. The train was positioned on the down fast line, and the crane shunted to position on the down slow line. The crane cleared the down slow line before 10 a.m., and was repositioned on the down fast line. This crane placed new track and slewed the fast lines.

The men from the layout depot with relaying gangs, and men from the maintenance length gangs, were booked on as follows, with permanent way inspectors in charge under the supervision of the Chief and Assistant Chief Permanent Way Inspectors:— Shift 1: (170 men) 10 p.m.



New junction at Shortlands, with the Catford Loop (on the right), laid on September 6-7, 1958

Saturday to 9 a.m. Sunday; Shift 2: (80 men) 9 a.m. Sunday to 8 p.m. Sunday; Shift 3: (12 men) 8 p.m. Sunday to 6 a.m. Monday.

Shift 1 broke the tracks in three places—one set for slewing over the plain line and conductor rails, laying new rail lengths by crane where required; another set dismantling and loading the existing junction, and laying in the new junction; and the third set taking out plain line and laying in the new temporary crossover. Shift 2 took over the same functions to finish the plain line and conductor rail, to finish laying the new junction and to connect up the temporary crossover. Very large numbers of men were required to lift, pack and slew the tracks, and to deal with the ballast unloaded from the hopper wagons. Shift 3 continued lifting and packing and aligning the tracks to sufficient standard for traffic to run.

The up slow line was made available for traffic at 9 a.m. on Sunday morning, and the down Catford Loop and down

slow line at 10 a.m. The two centre tracks remained under possession until 4 a.m. Monday. Once the two slow tracks were open, it was necessary to have an operating inspector to control the passage of trains past the cranes while the latter were operating. The bridges were slewed by the contractors' men under the supervision of the District Steelwork Inspector, on specially prepared runways on top of steel trestling.

Immediately the temporary crossover was down in the correct position, and the facing switches to the Catford Loop junction were laid, the signal department linemen, under the supervision of their inspector, commenced coupling them up for operation, to be ready when traffic commenced and to couple up their track circuits. All cranes and material trains departed on Sunday as follows:— No. 1 train at 4 p.m., No. 2 at 9 a.m., and No. 3 at 6 p.m. Thus yet another stage had been successfully completed.