



BEFORE—View of grade crossings at Church and Main streets were protected by eight manual gates

Elevation Causes Signal Changes

Several temporary interlockings and completely new permanent interlockings involved in extensive project that eliminates several grade crossings that were formerly protected by manually-operated gates

A GRADE CROSSING elimination project at Winchester, Mass., on the Boston & Maine, involving extensive signal and interlocking work, has been completed. The New Hampshire Division main line formerly was crossed at grade by two busy streets, with various other intersecting streets immediately adjacent to the crossing. This in effect formed a traffic circle with heavy vehicular traffic density over the tracks.

Just north of this intersection

there was an interlocking controlling a junction of the double-track main line with a double-track branch line known as the Woburn Loop. The main line has C.T.C. signaling for either-direction operation on both tracks north of the interlocking. South of the intersection was the Winchester passenger station, having heavy commuter passenger service.

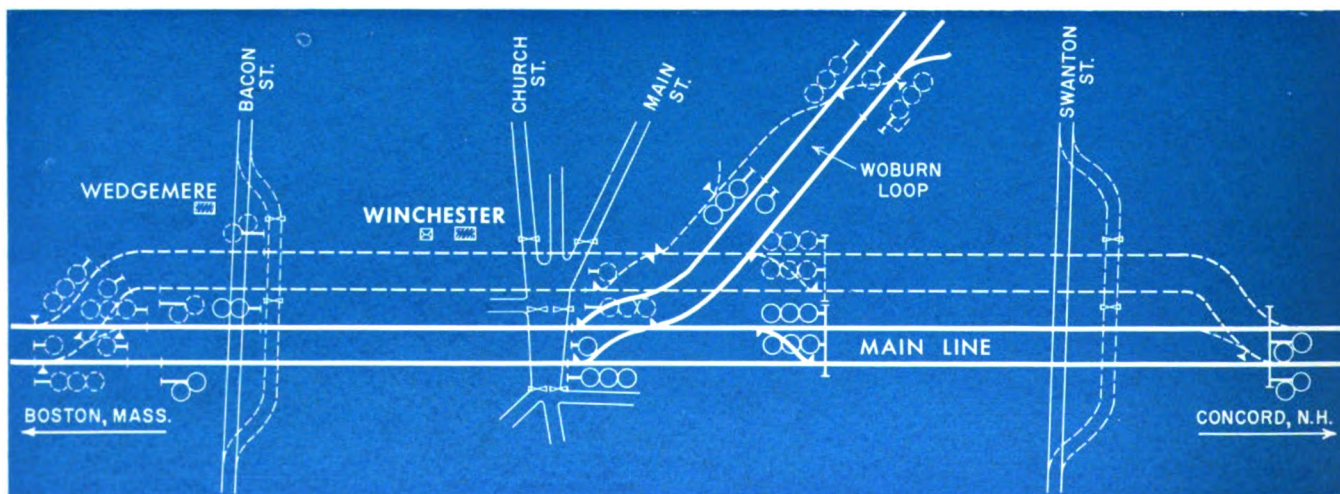
Winchester is 7.8 miles from Boston on the main line to Concord, N.H., White River Junction, Vt.,

and Wells River, Vt. At the latter two points, connection is made respectively with the Central Vermont and the Canadian Pacific for points in Canada. On typical day the rail traffic through Winchester includes 64 passenger trains and freight trains, as well as some local switching moves.

Eight Manual Crossing Gates

Vehicular and pedestrian traffic was protected by eight manually-operated electric gates and a system of traffic lights. These were controlled from a two-story brick tower. The railroad crossing tender was on the ground floor, and during rush hours a town policeman worked on the second floor to supervise traffic.

So important was this crossing,





AFTER—View looking same direction showing new elevated railroad structure and streets with no gates

considered that two control machines were installed, providing for duplicate controls on the first and second floors. The fact that this crossing was situated in the heart of the shopping district made traffic conditions intolerable. Consequently it was decided to provide a grade separation.

Temporary Interlockings

Detour tracks approximately 9,000 ft. in length were built alongside of the existing tracks. So close were the clearances that it was necessary to remove the roof overhang on the Winchester tower. This tower is the control point for C.T.C., including four interlockings, on approximately eight miles of main line north of this point.

While track work was under way the signal department installed new signaling, consisting of three automatic signals, eight interlocking signals, six switch machines, five electric locks and special circuits for gateman's warnings at four temporary grade crossings required by the necessary highway detours. Two of these crossings were on account of replacing existing overhead highway bridges by underpasses.

When the detour tracks, which included the new temporary interlocking, were placed in service, it was possible to remove the old tracks and commence work of grade relocation. As the new tracks were being built, the installation of new permanent signals was carried on, as well as the construction of another interlocking called "Wedgemere Interlocking" at the southerly end of the project. This consisted of

a temporary junction of the new two-track main line with the two detour tracks, and required the installation of six interlocking signals, six electric switch locks, two temporary automatic signals on the new main line, and a re-arrangement of existing automatic signals. This was made necessary by the fact that construction purposes required a short period of simultaneous operation over the permanent new tracks and the temporary detour tracks.

The signals and electric locks for this temporary interlocking were controlled from a miniature lever machine in a temporary cabin at the site, and the hand switches were thrown by a switch tender under the direction of the train director.

During this period it was possible to remove portions of the temporary Winchester interlocking from the detour tracks and re-use them in the new interlocking which was placed in service at the time the detour tracks were removed. At this time permanent track work was completed on the new high level, except for about 2,500 ft. on the Woburn Loop just north of the interlocking where single tracks had to be retained until a new by-pass highway was completed under the railroad.

New Permanent Construction

Electro-pneumatic switch machines and older model searchlight signals, previously in service at Winchester, were replaced with electric switch machines and later type plug-coupled searchlight signals. All previous cable, much of

which had been in service for years, was replaced with new cable, made by the Simplex Wire and Cable Company. These cables are run in ducts in the overhead concrete bridges, and are buried in the earth in the embankment sections. Beyond the new construction area, the cables are aerial on the pole lines. New lead-type storage batteries, made by Exide, were installed throughout the Winchester area.

Considerable communication work was also involved, including building a temporary pole line for supporting the railroad signal wires which were placed in one cable, and the Western Union and railroad communication wires which are in a separate cable. In the vicinity of the interlocking at Winchester and for some distance south, these were placed underground in ducts.

The former passenger stations at Winchester and Wedgemere had to be relocated to clear the detour tracks, and have been replaced by new modern stations on the high level. During the construction period, loud speakers were installed in both stations, with a microphone at the train director's desk in Winchester tower, so that he could announce all trains and minimize the time that passengers would have to stand on the exposed platforms during bad weather.

The signaling and communications projects were planned and constructed by Boston & Maine forces under the direction of E. N. Fox, Engineer of Signals and Communications. Switch machines, signals and other items of signal material were furnished by the General Railway Signal Co.