New Haven Concrete Interlocking Towers

Some Striking Examples of the Fact that a Structure Can Be Both Artistic and Useful

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Beauty in utility is the thought that comes to a person the first time he sees one of the New Haven road's concrete signal towers. The elliptical arch treatment of the pilasters and windows, the ornamental belt and the overhanging curved red tile roof give to these towers an architectural distinction not usually to be found in buildings of this character.

These towers are of monolithic concrete construction from the base to the roof, including the floors, and are reinforced throughout with corrugated iron rods, the floors being additionally supported with I-beams. The stairs, of ornamental iron construction, are attached to the outside of the building.

The curvature of the roof has a practical value, as well as artistic, and permits of a very wide overhang which shades the windows without darkening the rooms, the eaves being high and of open-finished rafters rather than heavy cornice work.

The operating room is well lighted, there being windows at the front and both ends of the building. The windows are designed with the lower sash much longer than the upper, so that the towerman may have an unobstructed view. The tower is designed to permit the lower sash being raised to the under side of the plate, which brings the lower edge level with the lower edge of the upper sash, thus affording a clear vision with the windows open.

A hard-maple covering is laid upon the concrete floor of the operating room, not only for the comfort of those who have to operate the interlocking machine, but to eliminate the fine dust that rises from the concrete by constant walking upon it, and which would settle upon the locking and cause excessive wear.

The towers are heated throughout by a hot-water system, the heater being located in the basement; and adjacent to the heater room is located a coal bin which may be filled through a chute from the outside of the building and at the track level. Open plumbing is used in the construction of the lavatory and the toilet, which are located on the same floor as the operating room in the electric interlocking towers, but upon the ground floor in mechanical towers.

In general design the towers are similar, whether used for mechanical or electrical interlockings, differing only in the details essential to the characteristics of the plant to be installed. In both mechanical and electrical installations the same design of terminal and relay rack is used, requiring wire ducts to various locations. These ducts are imbedded in the concrete during the construction of the building.

In the basements of towers for electrical interlockings there is a room for the storage battery, which is properly ventilated and thoroughly painted with acidproof paint. The cement floor drains to an opening, so that it may be flushed. The ground floor of the building is devoted to the terminal and relay rack and the power machinery. It is frequently found advantageous to install machines in these towers, not only to generate the power for the local interlocking, but for an entire signal system for a division of the road. In such cases the size of the tower is determined by the magnitude of the power plant rather than that of the interlocking machine. Of course, there is very little room upon the ground floor of a mechanical interlocking tower for power units, the space being required for the terminal and relay rack, the lower part of the interlocking machine, and the leadout. The interlocking machine is supported upon a pair of heavy I-beams which are placed longitudinally through the building, the ends of the I-beams being imbedded in the concrete

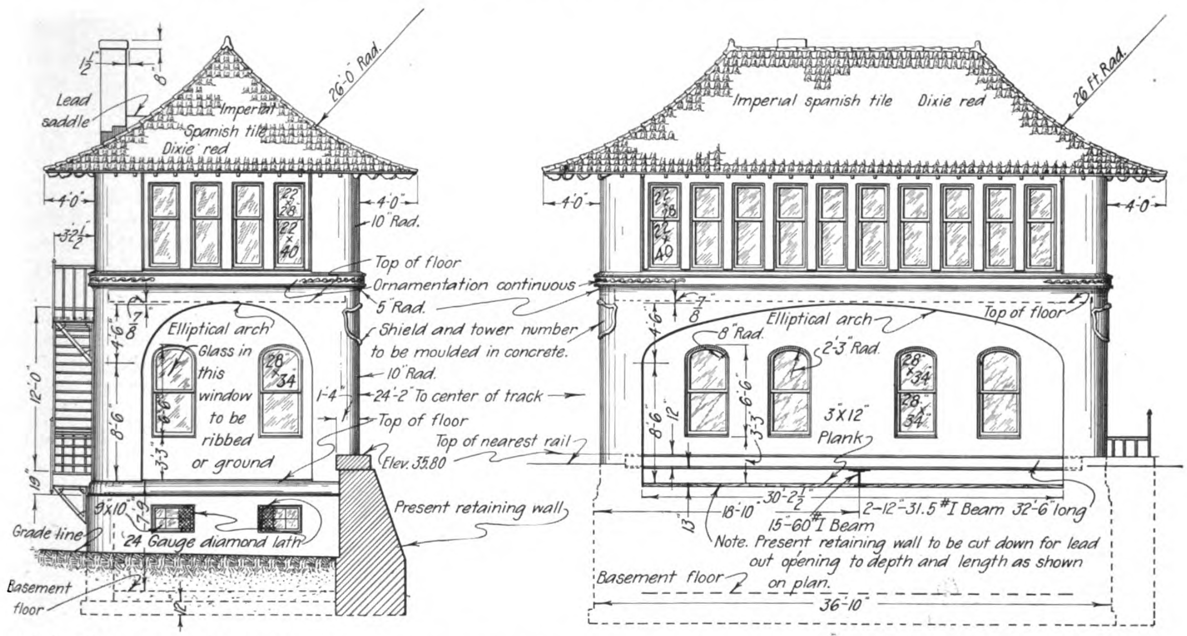

Fig. 1. End and Side Elevation. (Note the arrangement of the upper story windows and the height of the top of the sash in relation to the overhanging roof.)

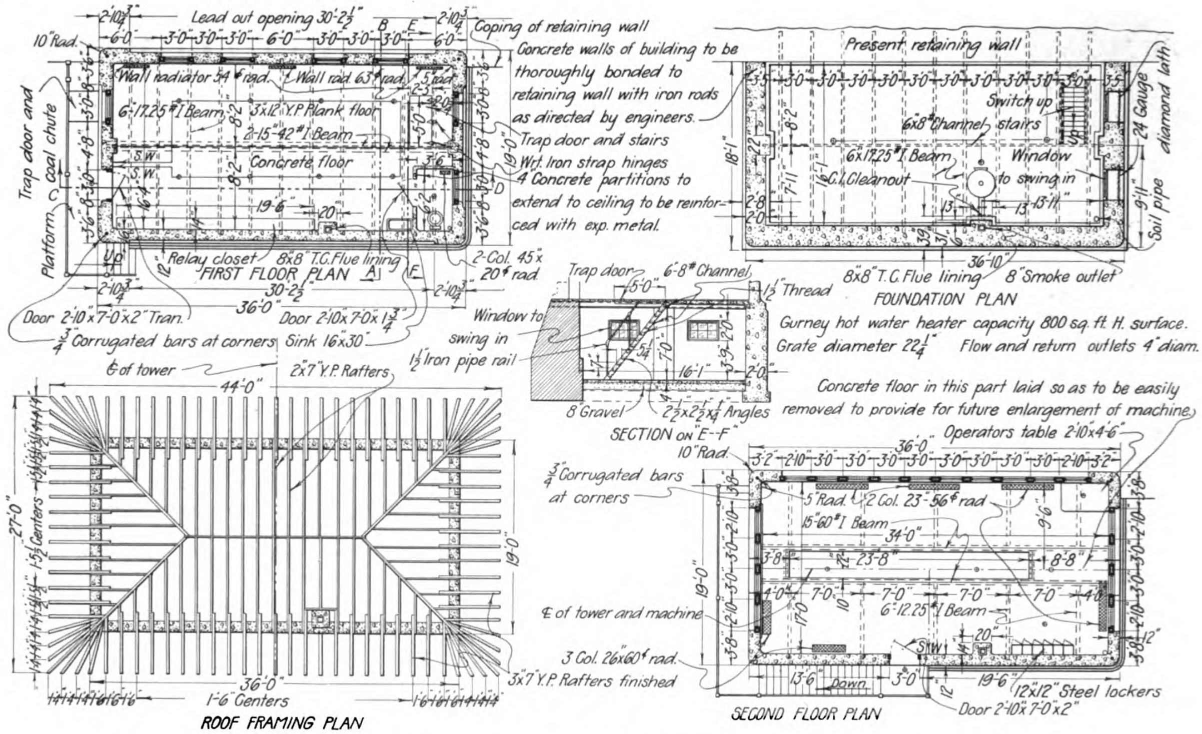

Fig. 2. Floor Plan for Mechanical Interlocking Tower. (Note the I-beam construction as shown by dotted lines.)

ends of the building, thus eliminating the usual machine frame.

The front wall of the tower is bridged upon I-beams to provide an opening for the leadout, and the leadout platform is supported upon the I-beams of the ground floor, which extend through the front of the building.

The life of a concrete tower is, of course, largely a matter of conjecture, and a discussion of the economic value of the concrete structure as compared with that of wood must naturally be a matter of assumption so far as the depreciation of the concrete building is concerned. In southern New England the average cost of a two-story concrete tower is $11.50 per square foot of base area, and the average cost of a similar-sized wooden tower is $6.70 per square foot of base area. A comparison of the relative values of the two methods of construction indicates that the concrete tower is the better investment.

The difference in annual charge is $97.20 in favor of the concrete tower, and this amount is 5¾ per cent upon the additional cost of the concrete tower over the cost of the wooden building. It is probable that a fireproof building constructed of hollow tile with stucco covering would prove of higher economic value than the monolithic concrete construction.

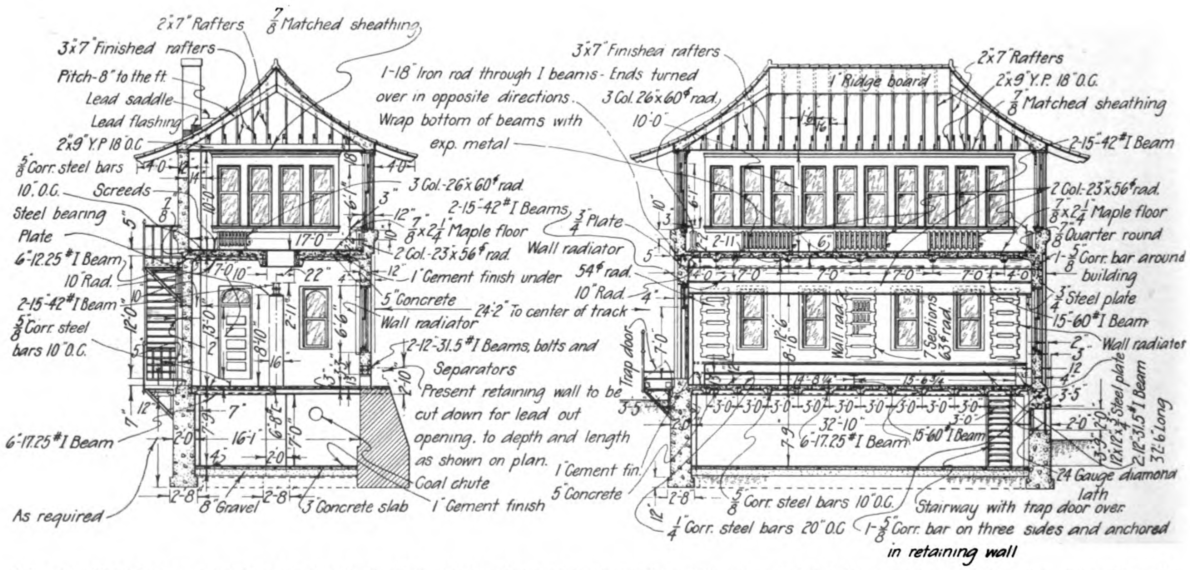

Fig. 3. Transverse and Longitudinal Section of Mechanical Interlocking Tower. (The I-beam construction for supporting the interlocking machine and bridging the leadout opening is clearly shown on these drawings.)

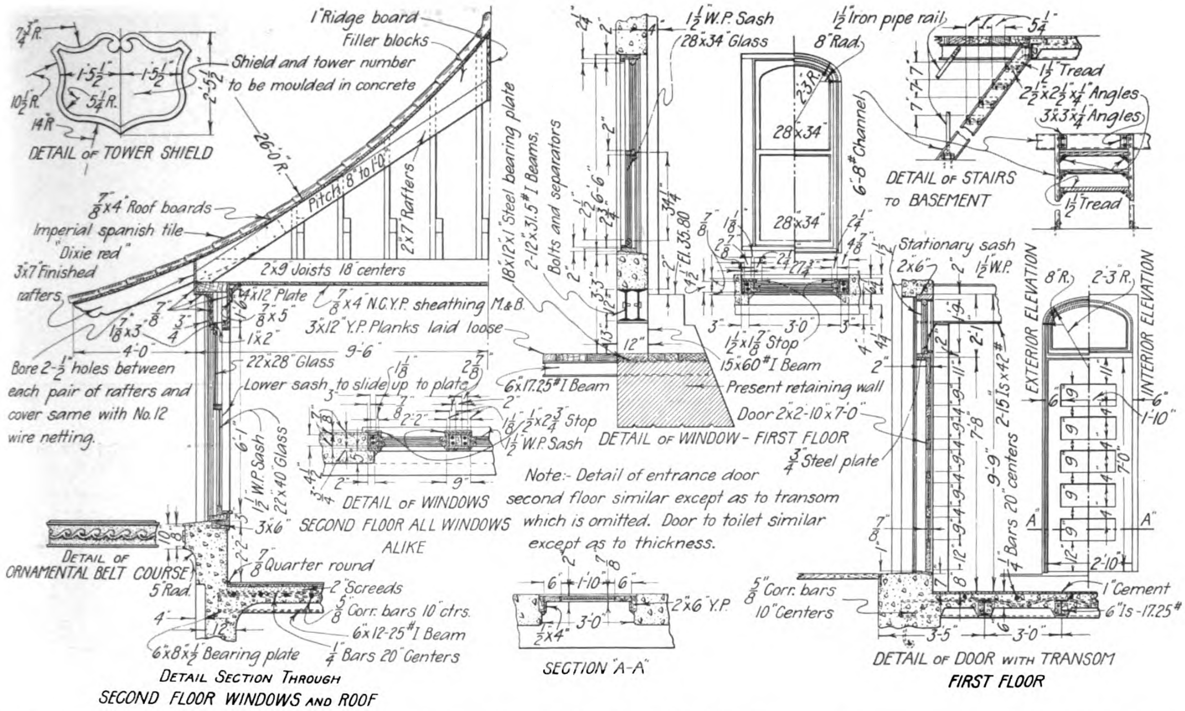

Fig. 4. Details of Construction. (From the details shown at the left of drawing, note that the arrangement of the window is such as to permit the lower sash to be raised to the plate, thereby bringing the lower edge level with the lower edge of the upper sash.)

However, the real value of the concrete tower to the railroad company cannot be calculated. It is dependent upon the value of the continuity of train service, and the fire risk of the locality in which the tower is located. The fireproof

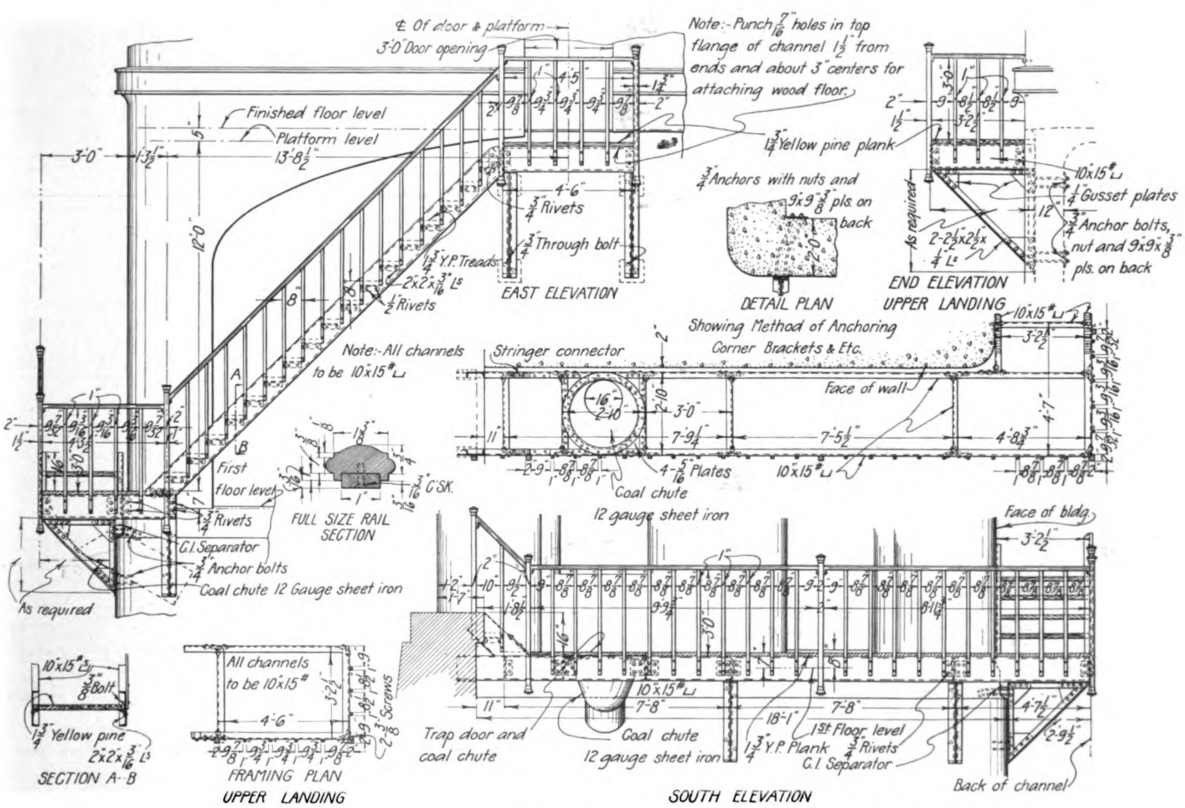

Fig. 5. Detail of Iron Stairway and Method of Attaching Stairs and Platforms to Side of Building.

charactertistics of the concrete tower practically assure the train service against any serious delay due to the destruction of the buildings by flames.

INVESTMENT FOR CONCRETE TOWER.

Cost of concrete tower, 16 ft. x 22 ft.		$4,048.00
Depreciation, estimated at 1½ per cent.	$ 60.72	
Maintenance—Repairs and painting window frames, sash and doors; repairs to plumbing and heating apparatus, annual charge	50.00	
Heating and lighting for one year	50.00	
Total annual charge	$160.72	
Capitalized at 5 per cent.		3,214.40
Total investment		$7,262.40

INVESTMENT FOR WOODEN TOWER.

Cost of wooden tower, 16 ft. x 22 ft.		$2,358.40
Depreciation, estimated at 5 per cent.	$117.92	
Maintenance—Repairs and painting building; repairs to plumbing and heating	90.00	
Heat and light for one year	50.00	
Total annual charge	$257.92	
Capitalized at 5 per cent		5,158.40
Total investment		$7,516.80

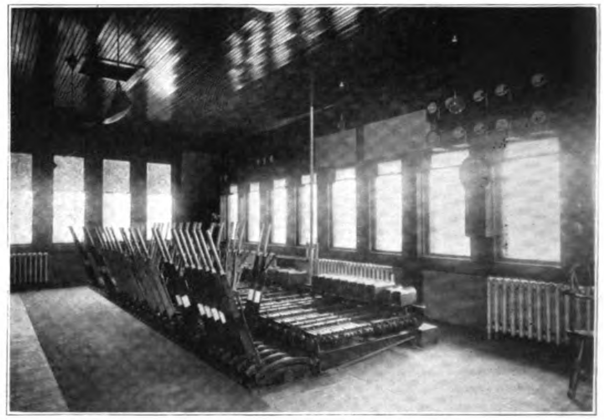

Fig. 8. Interior of Harrison Square Tower, Details of Which Are Shown in Figs. 1-5 Inclusive.

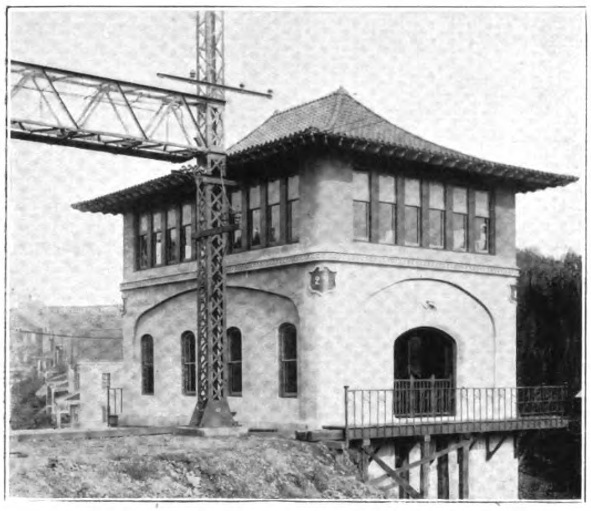

Fig. 6. Interlocking Tower at New Rochelle Juntcion, N. Y., the Largest Concrete Tower on the New York, New Haven & Hartford, Having Been Designed to Accommodate 55 2300-Ampere Hour Storage Battery Cells in the Basement, and Duplicate Motor Generators and Switchboard Equipment on the First Floor.. These Furnish Energy for the Complete Alternating Current Signal System of the Harlem River Branch, Comprising 11 Miles of Six-Track, Automatic Block and Two Mechanical and Four Electrical Interlocking Plants.

Fig. 9. Rear View of Concrete Tower, Promenade Street, Providence, R. I. In the Basement or Lower Story are Duplicate Sets, 55 Cells Each, of Storage Battery. On the Floor Above Are Duplicate Power Machinery and Controlling Apparatus for Supplying Energy to Local Interlocking Plant, and for an Alternating Current Signal System, Including Two Mechanical and One Electrical Interlocking Stations, Between Providence, R. I., and Fall River, Mass. The Upper Story is Devoted to Operating the Local Plant.

Fig. 7. Interlocking at Central Avenue, Bridgeport, Conn. (Note the contrast between the wooden tower and the concrete structure which displaced it.)

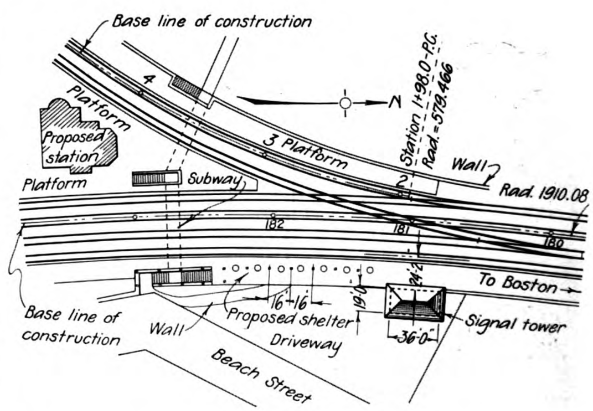

Fig. 10. Plan Showing the Location of the Signal Tower and Proposed Station.