sion for submission to the 1953 state legislature. The program calls for $35 million in new construction in each of the next two fiscal years and $12 million each year for maintenance.

Utah's State Road Commission has recommended a $35-million bond issue to aid in financing the state's highway requirements, which it estimates at $71 million. The commission's proposed five-year program of "urgent needs" would require $51 million in construction, rights-of-way $8 million, bridges and other structures, $12 million.

• **New York at work**—Another large section of the New York State Thruway will soon be under construction in Oneida County. The State Department of Public Works announced receiving a low bid of $5.4 million from Arute Bros., Inc. of New Britain, Conn., for the grading, paving and construction of an 8.81-mile segment of the Mohawk Section and construction of 4.92 mi of access drives and local roads.

Maj. Gen. Sturgis named to head Army Engineers

Maj. Gen. Samuel D. Sturgis, Jr. has been chosen to succeed Lieut. Gen. Lewis A. Pick, who will bow out as Chief of Army Engineers Nov. 30 having then reached the mandatory retirement age of 62.

Formal nomination of General Sturgis for the post will go to the Senate after the new 83rd Congress convenes Jan. 3. His appointment, however, subject to congressional approval will become effective Dec. 1. Sturgis is now commanding general of the Communications Zone of the U.S. Army in Europe.

Frank Pace, Jr., Secretary of the Army, said Sturgis will assume his new post as soon as he ends the business of his present job, probably shortly after the effective date of his new appointment. Maj. Gen. George J. Nold, Deputy Chief of Engineers, will be acting chief until Sturgis takes over.

Realtors optimistic on housing outlook

Opening sessions of the National Association of Real Estate Boards in Miami Beach early this week, heard an encouraging report from Joseph W. Lund of Boston, president.

He said the new political lineup will provide a more favorable atmosphere for private business operations, and asked the association to intensify its drive for slum rehabilitation. He predicted a need for new residences at more than 1,000,000 units a year.

Pier 57 floating-box principle to be used for bridge foundations

Ten of the 15 deep water pier foundations for the Thruway Bridge across the Hudson River between South Nyack and Tarrytown, N. Y., will be water-tight boxes of reinforced concrete constructed similar to those used for three sub-structure sections of New York City's new Pier 57 (ENR Oct. 30, p. 27).

This announcement was made last week with the award to Merritt-Chapman & Scott Corp. of an $11.8-million contract on its low bid for the pier foundations.

The ten boxes will provide a bouyant pier base resting on the silty river bottom. Engineers report that solid rock is too far below the surface at that point to be used effectively and economically for pier support. The air-filled caisson design was chosen to solve the problem.

Two of the water-tight foundation "boxes" will be 184 ft long, 100 ft wide and 40 ft high, and will weigh approximately 18,400 tons. Two will be 120 ft long, 60 ft wide and 40 ft high. The other six will be the same height, but slightly smaller.

• **To be floated**—To construct the 10 boxes. M-C & S will follow much the same procedure it recently used with Corbetta Construction Co., Inc., in building the substructure sections for Pier 57 in a natural dry dock. On completion, the boxes will be towed to the bridge site, floated into exact position, then sunk into place atop specially prepared gravel bases by filling them with water.

When in position, the tops of the boxes will be approximately two feet below the surface at mean low water. Piles will be driven to bed rock through wells in their walls to pin them permanently into place. As construction of the superstructure adds dead weight thrust on them, the water will be pumped from the boxes to effect the desired buoyancy.

Foundations for the five other piers to be constructed by M-C & S under the contract awarded will be built within ten 35-ft dia. circular steel sheet pile cofferdams, two for each double-legged pier. Under an earlier $1,572,849 low bid contract awarded last July, M-C & S is to construct foundations for the 10 easterly piers of the Thruway Bridge, starting at a point about one-half mile north of Paulding Ave., Tarrytown. These will be built within twenty 29-ft dia. circular cofferdams.

Work on the 15 piers under the new contract will begin at about mid-stream and follow an easterly line for almost a mile. It will provide the central link between M-C & S work on the east pier and pier work under way on the western leg by Construction Aggregates Corp.

J. S. Bixby, Poughkeepsie district engineer, will be in overall charge of the project for the New York State Department of Public Works, acting as agent for the authority. M-C & S's work will be carried out by the company's New York Marine and Heavy Construction Division, headed by Vice-president William Denny.

St. Lawrence pact scrapped by Canada

The Canadian government on Nov. 4 notified the United States government that it no longer is interested in the agreement covering joint development of the international section of the St. Lawrence River for navigation and power, which was negotiated in 1941 but never approved by the U. S. Senate.

The Canadians hold that the 1941 agreement has been superseded by the action of the International Joint Commission in approving the application of the two governments for authority to go ahead with power development in the International Rapids (ENR Nov. 6, p. 23).

Meanwhile, the Federal Power Commission, which will begin hearings some time after Dec. 1 on the application of the Power Authority of the State of New York for authority to join with the Hydro-Electric Power Commission of Ontario in building the power features of the St. Lawrence project, has received protests against approval of that application. These have come from the St. Lawrence Project Conference—backed by railroad and coal interests—from the Aluminum Company of America and its subsidiary, the St. Lawrence Power Co., and from the National Coal Association.

Objectors have until Dec. 1 to file protests with the FPC.

A contract has been let by the Canadian government for removal of Gut Dam, a low structure 900 ft long between two islands at the outlet of Lake Ontario into the St. Lawrence River. The dam was built about 1900 to maintain safe water levels in the channel leading to the present 14-ft canal around the International Rapids. This dam would not be needed for the deeper canal Canada now proposes to build.

New Tappan Zee Bridge design attracts two bidders, both under cost estimate

Possibilities are bright that the Tappan Zee Bridge, which will carry the New York State Thruway over the widest part of the Hudson River, finally will be built. Not only were two bids submitted for the steel superstructure last week but they were under the engineer's estimate.

Last December, the Thruway Authority failed to receive any bids, apparently because inability of steel companies to meet the state's estimated cost (ENR Dec. 25, 1952, p. 27). At that time, plans called for inclusion of a 1,112-ft tied-arch span and 400-ft-long deck trusses in the superstructure. As a result of the lack of interest in bidding, the main spans were redesigned. The arch and flanking truss spans were replaced by cantilever trusses, which the designer, E. H. Praeger, of Madigan-Hyland, considers less attractive in appearance. Also, one pier was eliminated.

American Bridge Division of the United States Steel Corp. was low bidder on the redesign. Its bid of $28,807,092 for 1.41 miles of steel superstructure (43,000 tons) was more than a half-million dollars under that of the second bidder, Bethlehem Steel Corp. The latter bid $29,363,008.

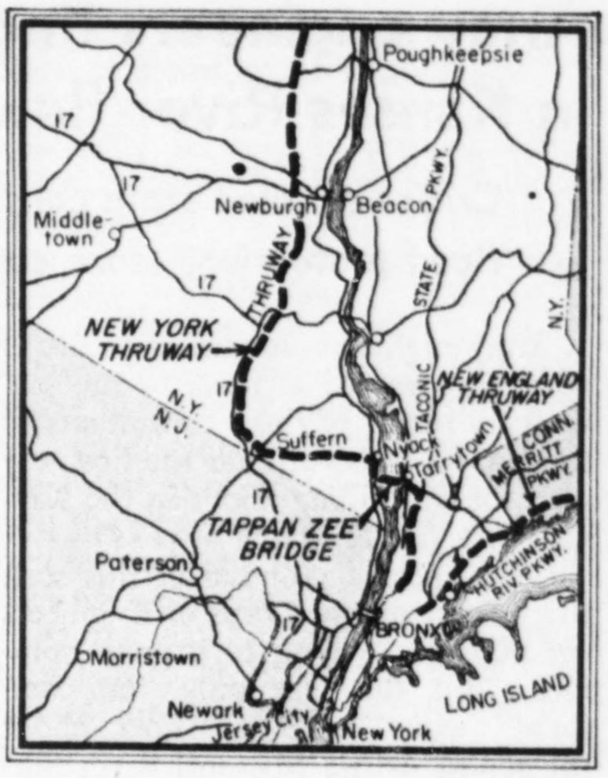
• **Three-mile-long bridge**—Expected to cost about $60 million, the bridge will be 15,300 ft long. It will be about 92 ft wide, sufficient for three lanes of traffic in each direction, separated by a 10-ft mall, and two 3½-ft-wide walks which are provided for inspection and maintenance.

At the west end, for a distance of 8,000 ft, there will be 160 steel-stringer spans carried on concrete bents spaced 50 ft apart. A $3,182,000 contract for the superstructure of this portion of the bridge, calling for fabrication and erection of 9,000 tons of steel, was awarded last February to American Bridge.

Continuing to the east, the roadway is carried on seven 250-ft-long deck trusses; these are part of particular interest in that the transverse members also are trusses, rather than conventionally used solid-web girders.

Next, to the east, are the cantilever trusses, which provide 135-ft vertical clearance over the river channel. Incorporating a 530-ft suspended span, the center portion spans 1,212 ft, the anchor arms, 600 ft each. The design of this portion of the bridge is of interest in that foundations, which were let under a separate contract, are floating concrete caissons on piles (ENR Nov. 13, 1952, p. 27). (Substructure contracts totaling $19 million were awarded last year to Merritt-Chapman & Scott Corp. and Construction Aggregates Corp.)

At the easterly end, the bridge terminates in thirteen 238-ft-long deck-truss spans.



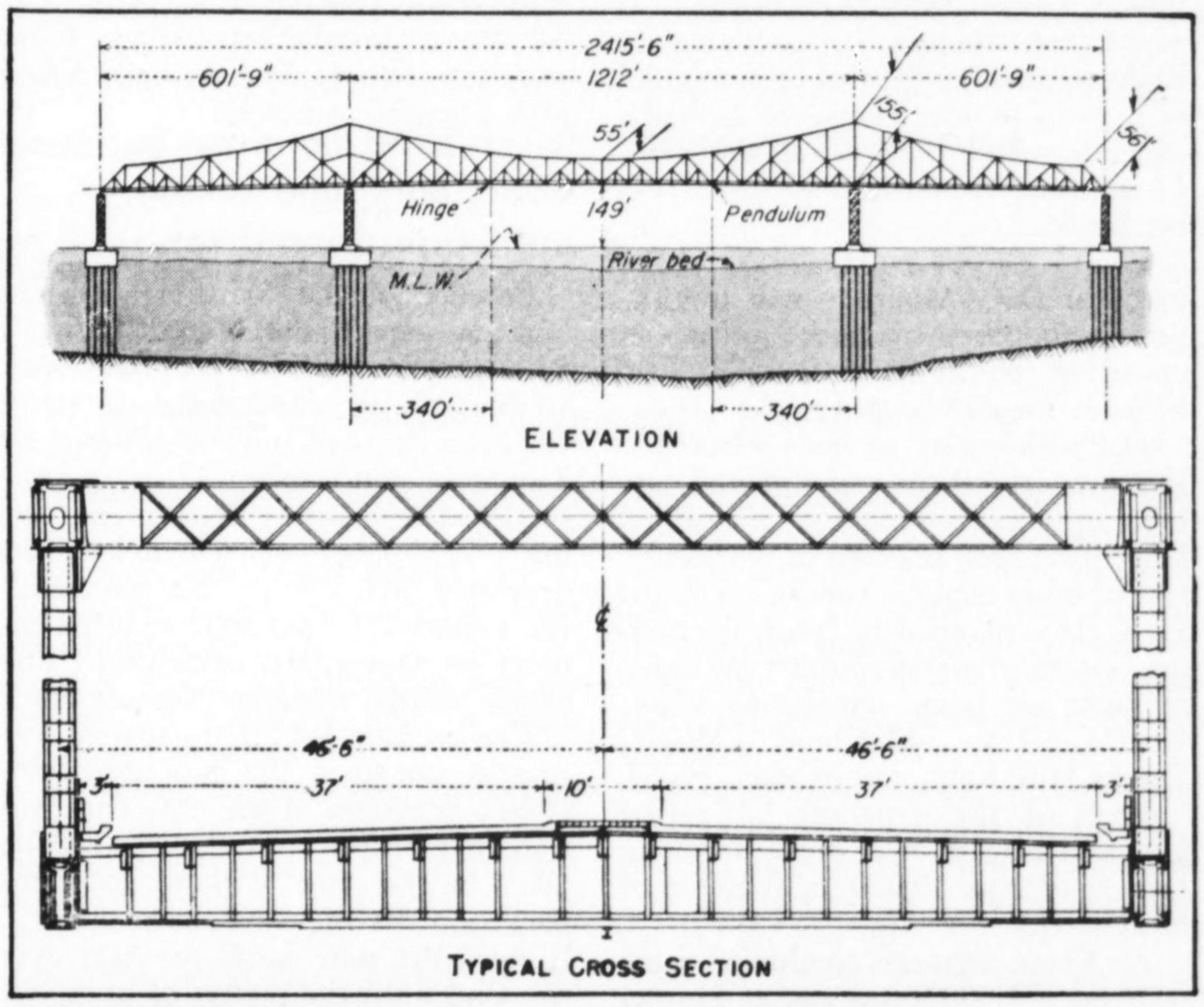
THRUWAY at its southern end will connect with important highways and will cross the Hudson between Nyack and Tarrytown on a 15,000-ft long bridge.

Being a part of the 535-mi New York State Thruway between New York City and Buffalo, this bridge will be financed by a bond issue backed by state credit and to be paid off by income derived from users of the thruway. The new bridge will cross the Hudson between Tarrytown and South Nyack, about 27 mi from the mouth of the river.

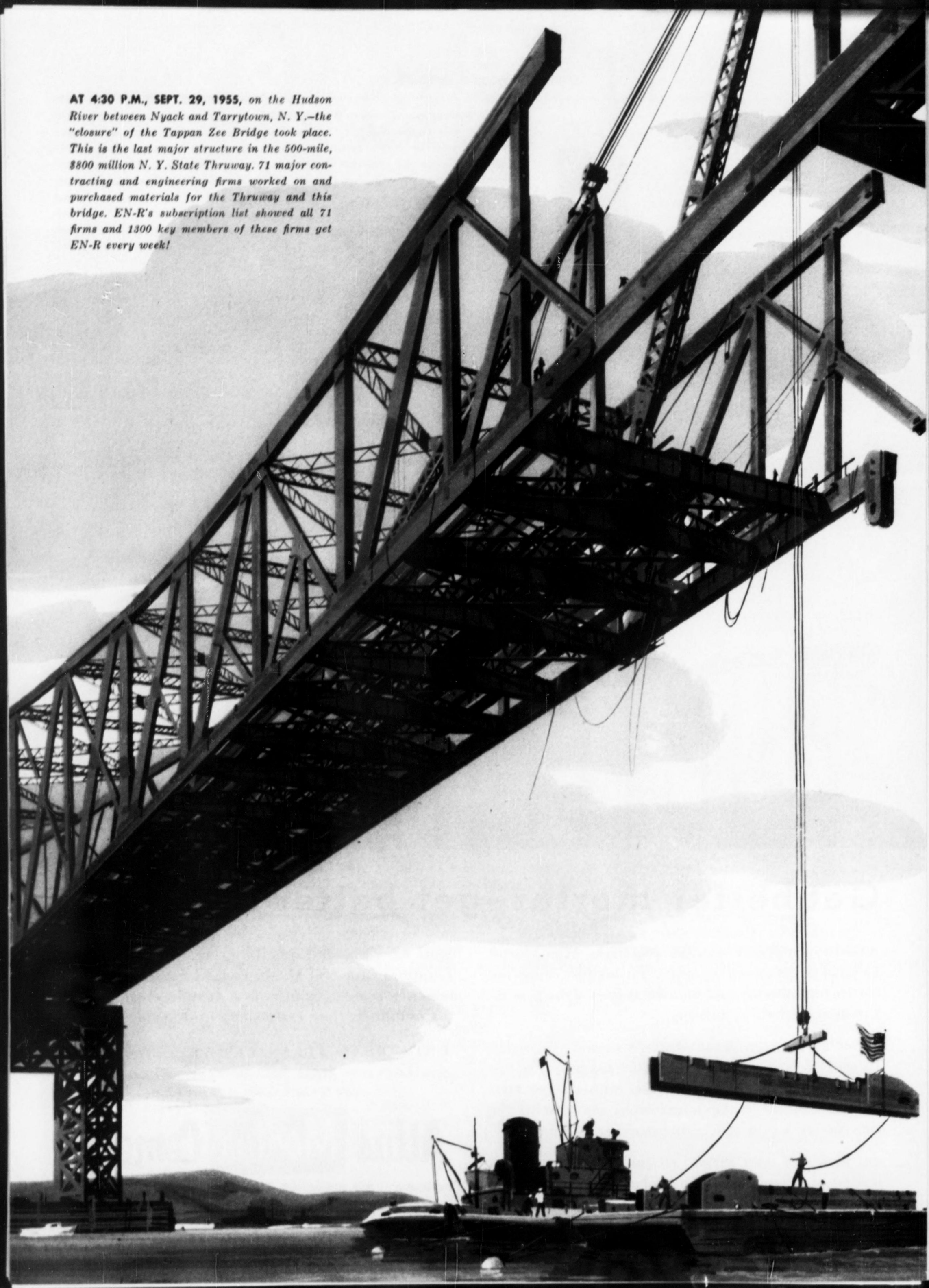
• **Controversial site**—This location, requiring a crossing over the wide portion of the Hudson known as the Tappan Zee, raised many questions when first proposed (ENR Feb. 1, 1951, p. 112). However, the Thruway Authority advanced sufficient reasons to justify it.

These included the necessity of connecting with the New Jersey Turnpike, New England thruway, N. Y. Route 17 and the Major Deegan Expressway, a north-south route through New York City—without compelling motorists to double back. The site also had to be this far (16 mi) north of the George Washington Bridge because of agreements with the Port of New York Authority. Furthermore, the terrain is favorable.

• **Another Hudson crossing**—The possibility of still another bridge over the Hudson also appeared brighter last week. Governor Dewey signed a bill authorizing the State Bridge Authority to study the economic and engineering feasibility of constructing a bridge between Newburgh and Beacon. The measure provides, however, that construction cannot be undertaken before completion of the proposed Kingston-Rhinecliff bridge over the Hudson.



CANTILEVER TRUSSES will carry the New York State Thruway over the main channel of the Hudson River. Foundations are hollow concrete-caissons on piles.



AT 4:30 P.M., SEPT. 29, 1955, *on the Hudson River between Nyack and Tarrytown, N. Y.—the "closure" of the Tappan Zee Bridge took place. This is the last major structure in the 500-mile, $800 million N. Y. State Thruway. 71 major contracting and engineering firms worked on and purchased materials for the Thruway and this bridge. EN-R's subscription list showed all 71 firms and 1300 key members of these firms get EN-R every week!*