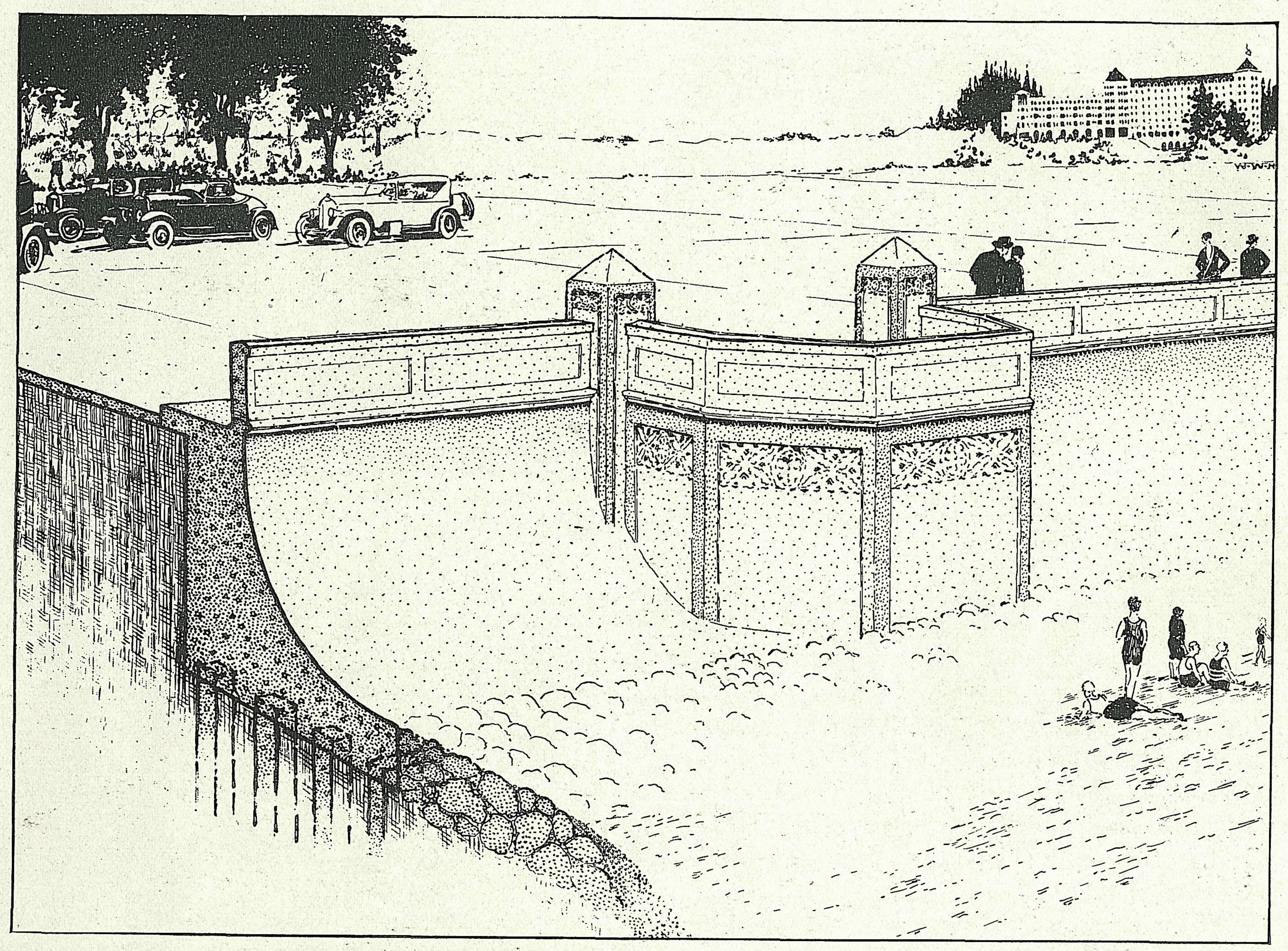


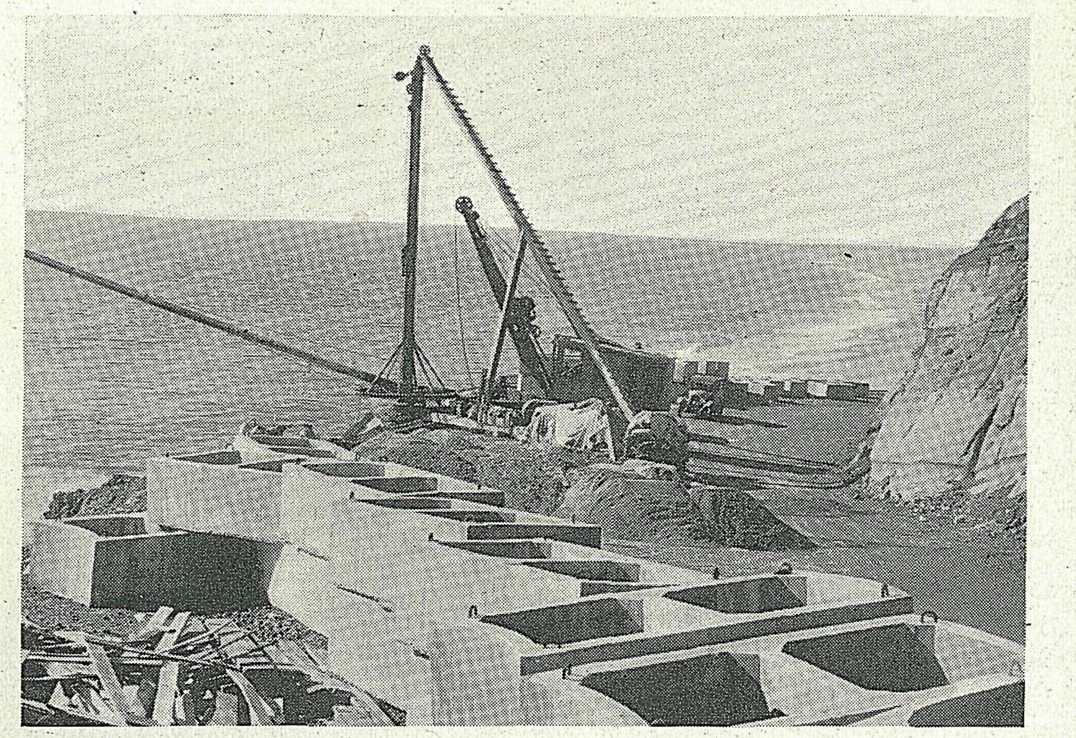
The parabolic faced sea wall is a favored type. This architectural sketch suggests an interesting arrangement of offset bays in which may be placed drinking fountains, seats or potted plants. Neat designs cast into the coping afford another means of decorative treatment.

portions such as 1-2-4 or 1-1½-3¾ will be stated in terms that fix the maximum amount of mixing water, including the moisture in the aggregate, that will be permitted with each sack of cement. In addition to this the slump may be specified, and the usual paragraphs on workability, curing and other pertinent items will be covered adequately. Only limiting proportions of fine and coarse aggregate will be stated in reference to the actual proportioning. The exact proportioning is left to the contractor to determine for himself on the job under the other conditions of the specifications.

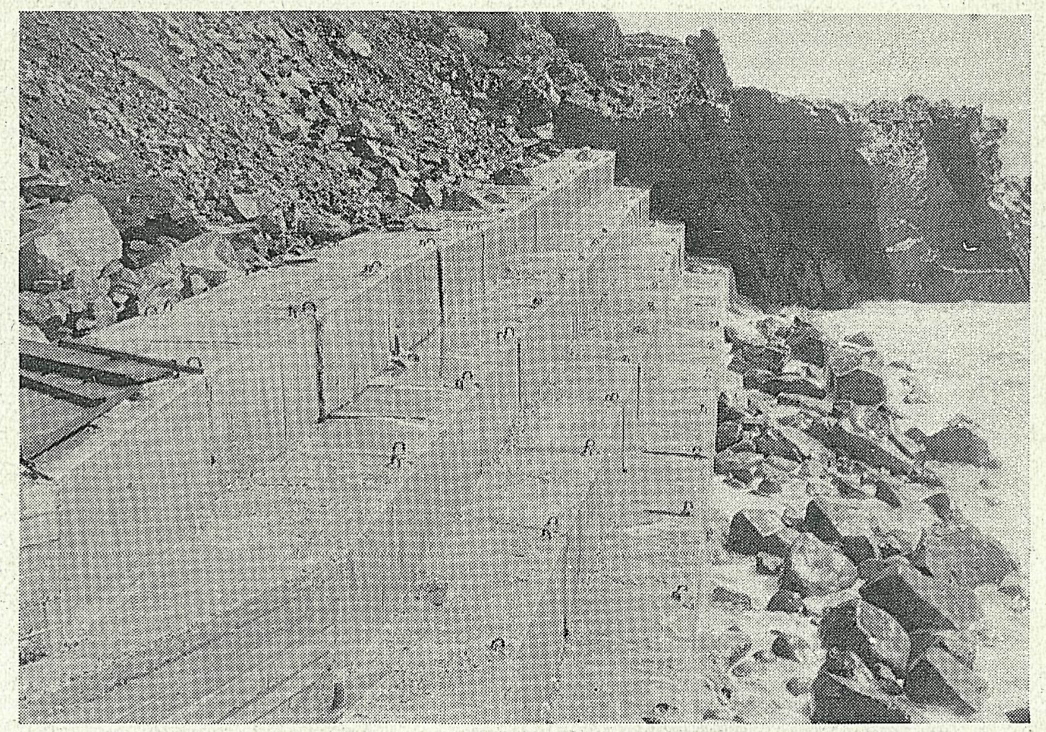
Under these conditions the contractor will naturally work toward the most economical mix, that is, in the direction of increased amount of either fine or coarse aggregate depending upon the relative costs of the ingredients. He will of course be concerned also with having a workability such that no extra cost be entailed in the placing. Too much aggregate in the mix, or a great excess of either fine or coarse will tend to destroy workability. As a safeguard against such a contingency, some limitations to the proportion of aggregates in the mix can be established in the specification.

On the job, it is necessary to determine a suitable mix with the fixed proportions of cement and water specified. This presents no difficulty and can be done by actual trial, making adjustments in the proportions until concrete of the character specified is obtained.

Preliminary trial batches may be made for estimating purposes. When concreting operations are started, full sized trial batches may be made in the mixer, using aggregates selected for the job. Cement and water in the specified ratio and reduced amounts of aggregate are first placed in



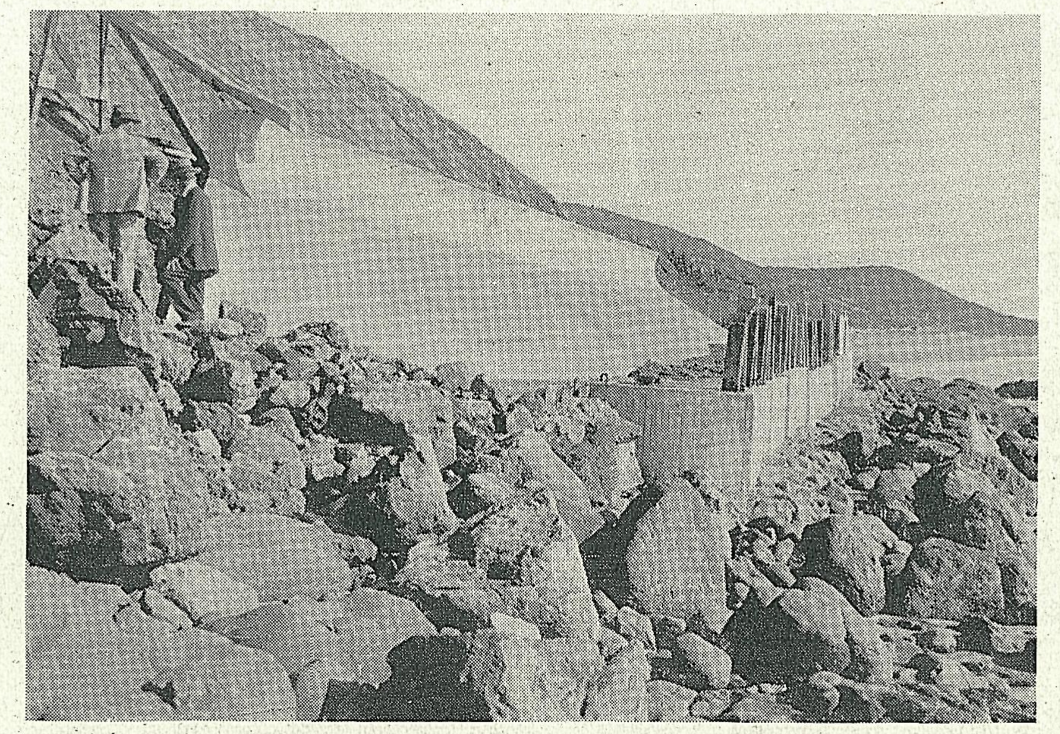
Huge precast concrete cells employed at Point Mugu, California, to form the base for a stepped sea wall. When in place the cells are filled with concrete. This type of work obviates the necessity of form construction in inaccessible or exceedingly rough locations.



Four tiers of precast cells in place and filled with concrete at Point Mugu, California. When filled each cell weighs more than 24,000 pounds.

the mixer. Additional sand and stone are then added in carefully measured quantities until the batch has reached the desired consistency.

As an aid to contractors who are not sufficiently familiar with local materials to estimate proportions for the first trial batch, Table II may be used. The mixes given in this table are based on dry compact volumes and proper allowance must be made for loose measurement and the effect of bulking due to moisture. Values should not be taken from this table for estimating purposes, nor should the mixes be taken as the final suitable proportions. As will be shown by trial, the actual proportions required to give the



Completed unit of concrete-filled precast cells, slope wall and return face coping near Point Mugu. The height of the slope wall varies from 15 to 20 feet. Design and construction of this wall were supervised by District VII of the California Highway Commission.

TABLE II

TRIAL MIXTURES FOR VARIOUS WATER-CEMENT RATIOS

Water-cement ratios indicated include moisture contained in the aggregate.

Proportions are given by volume, aggregate dry and compact. Thus 1-2-3½ indicates 1 volume of cement, 2 volumes of sand and 3½ volumes of coarse aggregate.

If the aggregates are to be measured in the damp and loose condition they will occupy greater volume than when dry and compact. Amount should be determined by test. Approximate average value for sand 20 per cent, for coarse aggregate 6 per cent.

The mixtures are given as a guide only. The first batch should be made with measured water content and the proportions thereafter adjusted to give the desired workability, maintaining the specified water-cement ratio.

Slump Inches	Trial Mix, Dry Compact Volumes for Maximum Size of Aggregate Indicated	
	1 inch	2 inches
Water-Cement Ratio 5 gallons per Sack (4000 lb. per sq. in.)		
½-1	1-1¾-2¾	1-1¾-3¼
3-4	1-1½-2¼	1-1½-2¾
5-7	1-1¼-1¾	1-1¼-2¼
Water-Cement Ratio 5½ gallons per Sack (3500 lb. per sq. in.)		
½-1	1-2-3	1-2-3½
3-4	1-1¾-2½	1-1¾-3
5-7	1-1½-2	1-1½-2½
Water-Cement Ratio 6 gallons per Sack (3000 lb. per sq. in.)		
½-1	1-2¼-3¼	1-2¼-4
3-4	1-2-3	1-2-3½
5-7	1-1¾-2½	1-1¾-3
Water-Cement Ratio 6¾ gallons per Sack (2500 lb. per sq. in.)		
½-1	1-2½-3½	1-2½-4
3-4	1-2¼-3¼	1-2¼-3¾
5-7	1-2-3	1-2-3½
Water-Cement Ratio 7½ gallons per Sack (2000 lb. per sq. in.)		
½-1	1-3-4	1-3-4¾
3-4	1-2½-3¾	1-2½-4¼
5-7	1-2¼-3½	1-2¼-3¾