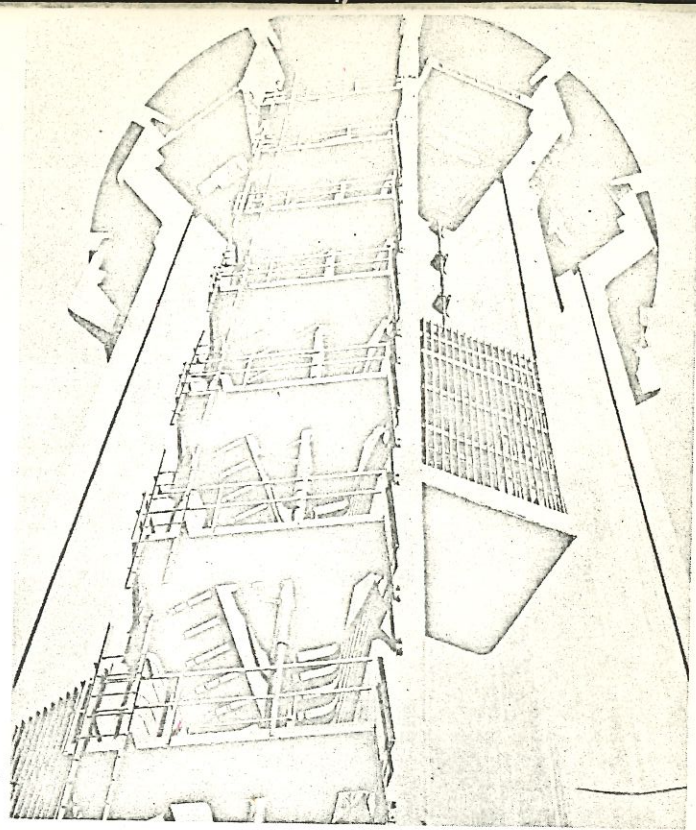


## Multi-level water intake

### feeds Caracas, Venezuela

This 200-ft-high tower contains sluice gates at five levels, to give flexibility in water temperature and other parameters to water-supply engineers at Camatagua Reservoir, a main source of water for Caracas, Venezuela. The reservoir is in the bed of the Guarico River, and about 35 miles from Caracas. The reservoir has 842 sq miles of surface area, with depths reaching over 200 ft. Photo courtesy the Rodney Hunt Co., which supplied the ten 36- by 72-in., electrically-operated sluice gates in the tower.



## Double-duty floodway proposed for Memphis

Nonconah Creek is a major drainage stream just south of Memphis. In order to prevent flooding of developed lands in the area, the Shelby County Conservation Board and the U. S. Soil Conservation Service are proposing as part of the upstream watershed protection program, and as one possible solution, a 600-ft-wide floodway 11.3 miles in length (see sketch) on which no development would be allowed. Anyway, the strip will have been acquired by 1975 as a greenbelt by the County Conservation Board.

It would slope gently toward the existing channel bottom on a 12:1 slope. The invert section would be paved an average width of 80 ft of the 600 ft to carry the more frequent flows and to protect the channel bottom from degrading. The earth section would be sodded with a dense turf and could be landscaped with trees along the outer edge. Excessive storm runoff equal to the 100-year flood would be carried by the grassed floodway

The gentle slopes would not adversely affect recreation uses such as bicycle and hiking trails and picnicking. Maintenance would be possible with present park equipment and this paved invert would provide access to both sides of the floodway. The paved invert would have the capacity to carry the release from the proposed flood-control and recreation reservoirs in the area, plus some from the uncontrolled areas.

Proposed works include also a large dam on the main stream, and two smaller upstream floodwater-retarding structures on tributaries. The structures

would provide 24,200 acre-ft of flood-prevention storage, and 13,200 acre-ft of recreation storage, at an estimated installation cost of \$10.6 million, including \$7,000,000 for the floodway and paved channel.

An alternative solution, proposed in 1956, was for a far more costly rectangular concrete-lined channel which would carry the maximum storm runoff of 100-year record or greater. Updated estimates place its cost at \$50 million or more. Similarly, a conventional unlined

channel, protected primarily by grass, with capacity to carry this discharge within banks would have velocities far too high for the types of soil material present. This would incur high maintenance cost, again making economic justification difficult. The floodway and greenbelt strip appear to be the most practicable and feasible solution.

(Editor's note: Our thanks to William E. Bush, M. ASCE, of the Soil Conservation Service in Memphis, for this information.)

