

# HYDRO-ELECTRIC PLANT AND BRIDGE SPANNING SUSQUEHANNA RIVER 3 MILES BELOW CONOWINGO

By D. F. MAGEE

Many people know in a general way but few have stopped to consider that, within thirty-two miles as the crow flies and forty-five miles by good, hard, smooth roads, there has been built and now nearing completion the finest and largest hydro-electric plant in this country if not in the world, and at the same time a magnificent concrete bridge and boulevard beautifully finished and lighted crossing the scenic Susquehanna at a height of one hundred and eight feet above the bed of the swift flowing river.

It is located in the State of Maryland, and connects the west shore of Cecil County with the eastern shore of Harford County, between high rolling wood clad hills on either side, and overlooking from its lofty heights a scene of beauty that Charles Emory Smith, the then famous Editor of the Philadelphia Press, some twenty years ago, stated to the writer hereof was one of the grandest views he had ever looked upon either in this country or Europe.

The engineering work of the whole scheme and plans is considered as the nearest to perfection known up to this date, and this applies to the means, methods and machinery used in the actual construction of the wonderful work as well as the whole finished project and product of the operation.

The solid, immovable parts of the structure with solid walls of reinforced concrete eighty feet in thickness, one and a quarter miles in length, grounded deep upon the eternal rocky bed of the river, and so anchored that no flood water or ice flow can possibly injure or destroy even though the deluge of Noah might be repeated.

Dam, bridge and driveway are all of one unit, bound and anchored in one solid mass, with the open driveway at the extreme top and immediately over and a part of the dam.

The solid concrete resting upon the river bottom rises to a height of eighty-six feet to the spillway, and extends in unbroken line from shore to shore, and then a long succession of piers and posts cast and moulded in one mass with the base is superimposed upon this, with openings between each pier of fifty feet, and on top of these piers rest the driveway or boule-

vard for autos. The driveway floor between curbs being 22' feet wide with walkways, runway for heavy crane, etc., on north side, and a four foot solid concrete railing or sidewall along either side of the driveway which protects in safety the automobile traffic, and makes it impossible under stress of any kind of an accident among the autos, for an automobile or passengers to be projected over the side of the driveway into the river.

Between the piers as above mentioned there are flood gates made of structural steel of great strength, twenty-two feet high and forty feet in length and weighing forty tons each, which are raised or lowered as they run in grooves up and down in the piers from the top of the spillway up to the top floor of the driveway; which gates are raised or lowered much as a window sash is moved up and down in its frame when hung on weights. In this case there is but one cord in the centre, that cord being a powerful cable which is worked by the travelling crane before mentioned. This crane is propelled by a gasoline engine and moves from end to end of the bridge wherever a gate is located.

These gates extend two-thirds way across the top of the spillway upon which they rest when down, and their use is rather new in dam building and is considered by the engineers as a wonderful acquisition in a dam such as this, in two particulars.

They enable the builder to add twenty-two feet in height to the top of the normal level of the spillway and this on account of the increased pressure of this greater depth of water upon the turbines 106 feet below, increases the power of the turbine nearly thirty per cent. Thus when that

h. p. runs into millions of h. p. at normal, one can readily see the great power gained.

In the second place they are an ever ready safety valve, as it were, in time of sudden or excessive floods in the river, as they can be lifted quickly from top of spillway by the crane and allowing the excess water to flow over the spillway at that much lower point; all danger from freshets, floods or ice gorges against the breast of the dam are removed and the drift ice, water or floating trees or debris pass safely over the crest of the spillway and flow down the river.

The innumerable turbines will be placed upon the west or Harford side, where the outlet channel from them, the tail race as it is called, can readily find its clearance in the great depth of the river immediately along the western shore. As is well known this great natural depth is found along this west bank at a number of points, notably at Bald Friar, Conowingo and frequent points on the west side clear down to head of tide-water some seven miles below.

The work is now nearing completion and it is calculated they will have the bridge open for traffic by November. There is now only about 500 feet of the dam proper to be built to bring the two sections together at or near the middle of the river; the work having been built from each side of the river towards the middle and done by two different contractors, namely, the Annarundel Corporation and the Stern & Webster Construction Co., a western organization. The latter company has completed its portion and is now aiding with the completion of the western section.

The complete plants of these two organizations are a marvel in themselves, and it is this that has made possible the rapid speed at which this work has been pushed through.

The crushed stone, gravel, cement and sand is all handled by machinery, untouched by man or shovel from the time it is dropped from the bottom of the freight car into a hopper and from there carried along in chain belt conveyers to a high tower, and thence falls by gravity into enormous mixers, and thence into dummy cars holding five tons each, which are then run over tracks to the foot of a movable tower placed near the point of delivery, then each car lifted up into this movable tower where one man by movement of a lever dumps the mass into conveyor spouts through which it is delivered from the nozzle of these spouts directly upon section that is under construction. Here for the first time it is touched by man power as two men spread it over fast filling

forms of the breast or piers or foundation in course of construction. Hundreds of freight cars are in the yards below, adjacent to the lower or south side of the dam, removing the empties, hauling in cuts of the loaded cars from the main track and returning the empties to make up departing trains for the quarries and cement supplies etc., etc.

### MEMORIES

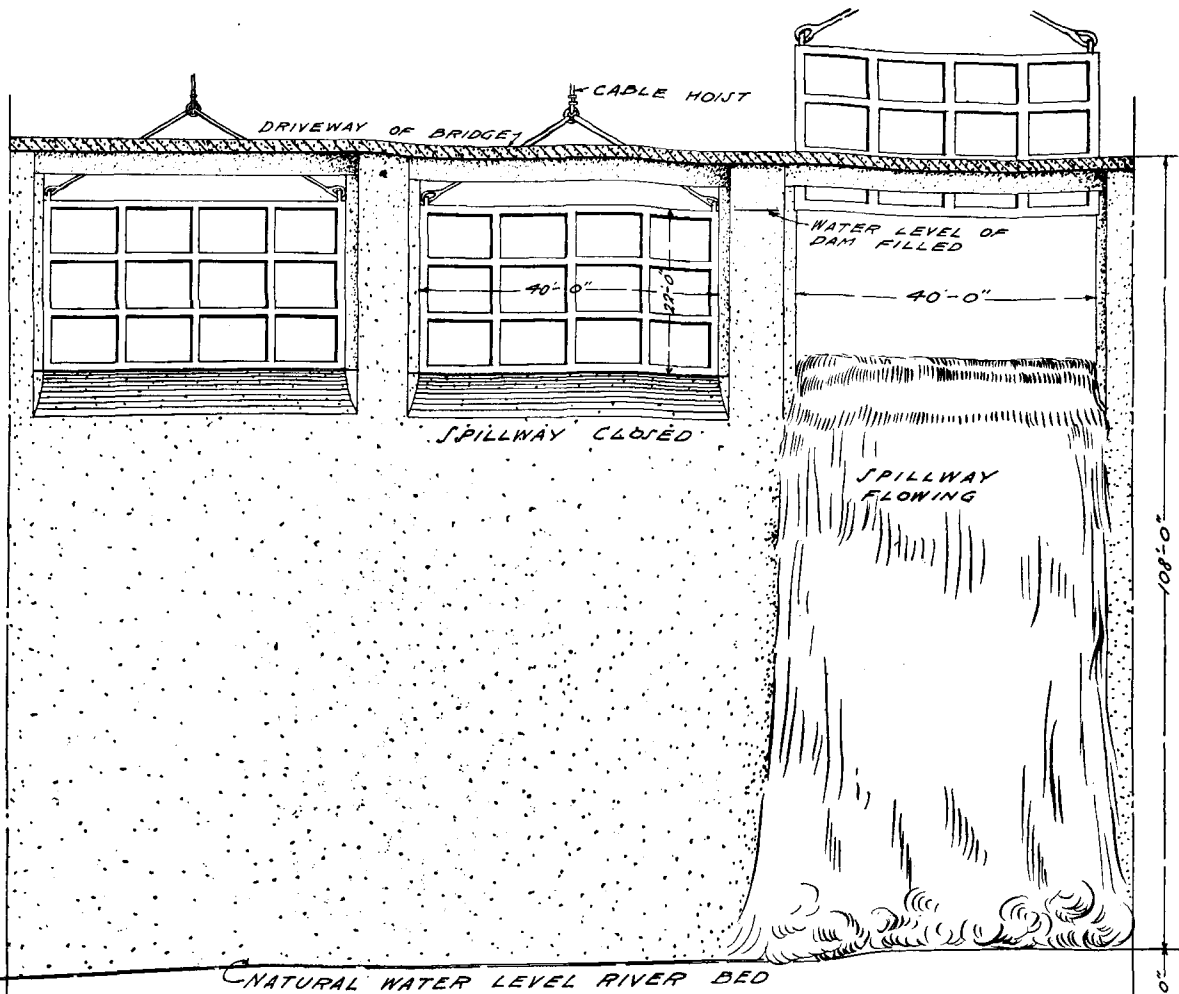
Yet to the old timers that have known this beautiful stretch of water in years past it will work a wonderful change when this great lake of smooth water rides from view the old familiar haunts when the black bass and salmon in spring and summer, the wild duck by thousands through fall and winter and the shad and herring were all legitimate prey for the riverman and the farmer folk of the Lower End.

Extensive office buildings house the engineering and clerical forces on the job, hundreds in number; and five thousand superintendents, bosses, foremen, laborers are seen hard at work at all points where the massive proportions of the great work is being moulded and growing into beautiful and symmetrical form which will be a monument to the engineering skill of this day for centuries to come.

As one approaches this Dam and Bridge from the Cecil County side over the new concrete state road, he comes from an elevation five or six hundred feet down a curving grade of some ten per cent. and first catches sight of the bridge as he rounds the curve, and looking down upon its one and a half mile length with widened approaches and full fifty feet of total width over all it looks like a magnificent boulevard such as we sometimes see about the big cities. When lit up with electric lights as it will be from end to end, it will present the appearance of fairy land. By the way, the electric lights will not be placed high up as usual beside the bridge on standards, but are arranged low down set into hidden sockets in the side wall of the driveway and so focused that they will throw all the light upon the floor of the driveway along a four foot level, and will at no point reach the eye of the driver or blind him with their glare.

The river bed itself as seen up river side looks like a mass of woods owing to the great growth of trees on the innumerable islands scattered throughout its shallow bed. These trees are now at an average height of some sixty feet and naturally as viewed from

A 175 foot section of dam, with two gates lowered and one raised



the shore the foliage completely covers the water flow wending its way through hundreds of channels of flowing water.

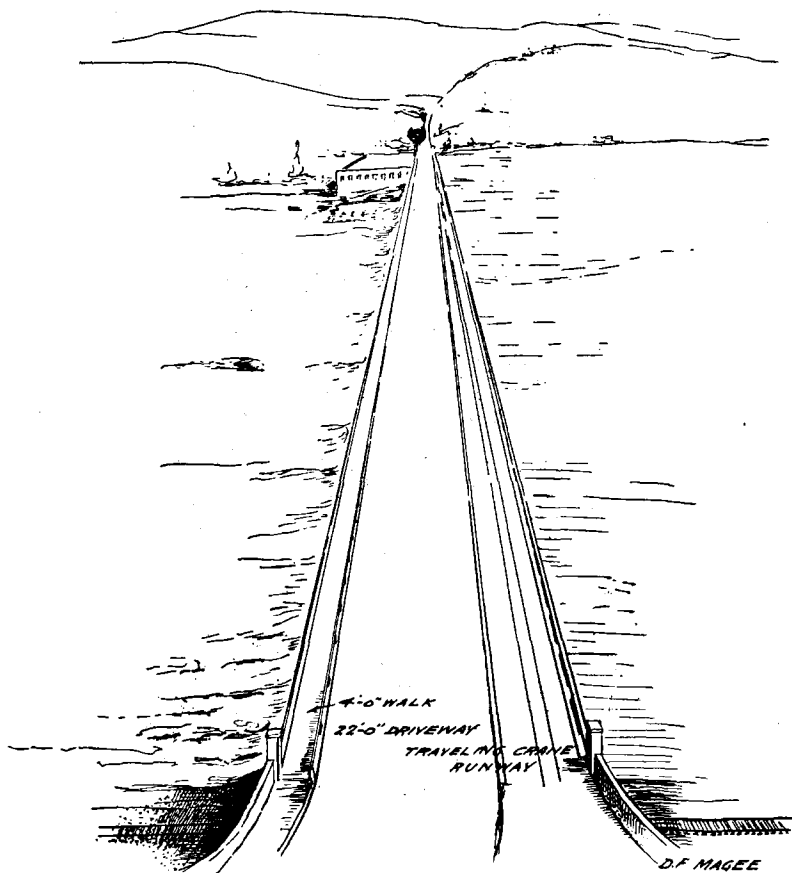
It is estimated that when the dam is filled it will cover all these trees to the top and they will disappear from the surface of the great lake that will be formed extending in great depth ten or fifteen miles up the river.

However it will not be of sufficient depth to cover trees and islands for more than six or eight miles and possibly not that far.

When one thinks of this forest of trees which will stand for years far down beneath the placid waters; it starts ones fancy in thought and reverie of the years that are past, and may it not well give us pause to guess and study whether or not this great lake at our doors cannot be made to

teem again with game fish of another kind, which may find here in this fresh water the pickerel or the perch, the pike or the sun fish of our northern lakes may be planted, multiply and thrive. Here is a nut for the Izaak Walton, the Fishing Clubs, the summer camping clubs, the fish commissioners and the sporting fraternity, generally, to crack.

Why not yacht sailing clubs with their cat boats, the swift travelling ice boats of the Hudson, the hundred mile an hour gasoline racer, establish homes in or about Fltes Eddy, Ferncliff, Peach Bottom, Bald Friar. If we have an airport in Lancaster why not many seaports in this old romantic country, and a landing port for hydro-airplane. Let your fancy play this winter and let's see who will be the first to start something worth while to fit this new situation at our doors.



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