

REPORT OF THE CITY ENGINEER

To the Honorable City Council of the City of Worcester:—

Gentlemen: As required by Chapter 7 of the Ordinances of the city I herewith respectfully report relative to reservoir work for the fiscal year ending November 30, 1916.

The work of this character has been confined principally to the building of the Pine Hill dam, and as a partial report it is desired to say that the work has favorably progressed, although the labor situation had the effect of retarding the work somewhat below the moderation intended. It has been impossible to offer any inducement to obtain a force of men much beyond what was carried through the cold or non-construction months of the year. The frequent coming and going in the aggregate was about one hundred per cent. of the normal force employed, yet at no one time were there many in excess of the number of men who have been more permanently engaged, and as the season advanced even this number was slightly reduced by those who sought or obtained employment at greater wages or in more comfortable surroundings. A similar situation seems to have existed in other municipal departments as well as in a general way, and while such a condition has been somewhat of a handicap, very good advance has been made, and the work so far accomplished has been of excellent quality.

The heavy excavations required to obtain a satisfactory foundation give the impression of slow progress, but it should be remembered that the greater portion of the structure is below ground, and when once the surface is reached the advance will more readily be seen.

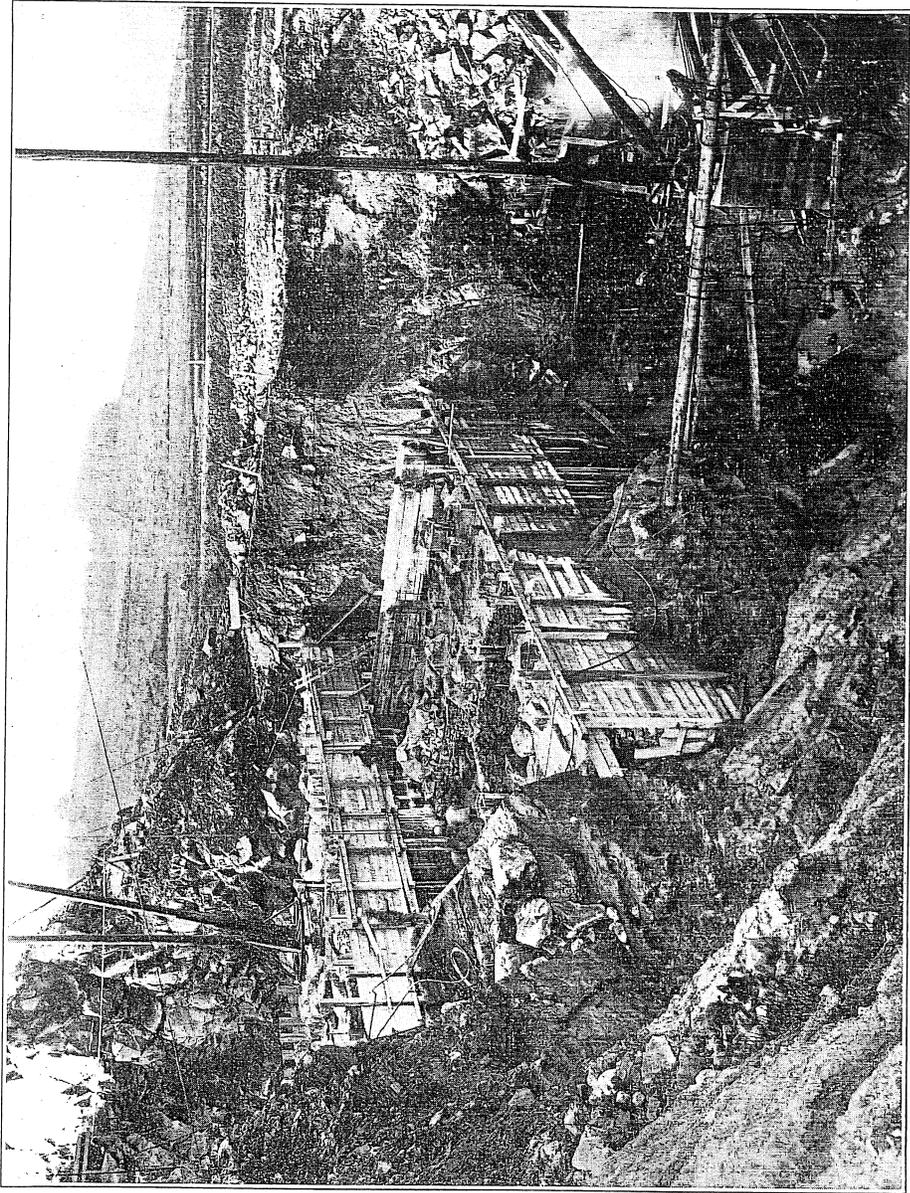
On portions of the work so far accomplished the excavations have reached a depth in the maximum approximating forty feet below the surface of the ground, and often required the removal of great quantities of ledge before a suitable hardness was obtained. Care was necessary in the removal of the ledge to avoid any disturbance of existing seams, and when the final depth was reached numerous drill holes were carried from twenty-five to thirty feet deeper to ascertain if further seams or fissures existed below the level of the excavation. Each drill hole was then tested for tightness with water under pressure, and if the water escaped from

the boring a thin cement grout was then forced into all connecting seams under a pressure of ninety pounds until refusal to accept more. It can easily be understood that this work required time, and practically the first twelve months of active work on the dam itself were occupied in this manner, so that it was not until the month of August of this year that any stone and concrete composing the structure was placed in position.

The plan divides the dam longitudinally into sections about forty feet apart to provide for expansion and contraction due to changes in temperature, with cut-offs and drainage wells for each section. Four of these sections have been commenced, and one of them can soon be placed in readiness to receive the discharge pipe intended for the operation of the reservoir. It is hoped that provision for carrying on the work will permit the placing of this pipe soon following the passage of the freshet waters of the spring months next following.

In anticipation of next year's work the quarry for furnishing the large stone for construction purposes should be worked industriously the entire winter in order to obtain in advance the large quantities required when in full operation. This work also includes the preparation of material for concrete and mortar sand. Much of the stone already used was procured from the excavations for the dam, and when washed and prepared was used for construction.

As the building of the dam proceeds, another location for the waters of the stream that now flows in the temporary channel provided in the side hill will be required, and which it is hoped may be created in the early months of the spring, so that the deep excavations in the northerly hill may be carried on. This would give opportunity for the employment of a larger number of men if they can be procured, and by so doing get the structure to a height that will the sooner permit its partial use for the impounding of water. The fact that opportunity for storing the greater volume of the water from this shed is now lacking should not be lost sight of, and the rapidly growing need of its use as indicated by the last water census requires continued building until completion. Such structures cannot be raised in response to immediate needs, and therefore should be built in advance of any possible contingency. The organization now employed by the city is the product of several years' occupation in this line of work and if allowed to disperse could not again be readily collected. Skilled men or men who have become skilled during the various constructions heretofore made,



SECTION OF PINE HILL DAM 40 FEET BELOW THE SURFACE

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are very necessary to the proper conduct of the work, and should be kept employed as long as the need and policy of such operations are evident, and I therefore advise and recommend that this work progress without interruption until completed.

Very respectfully submitted,

FRED'K A. McCLURE,
City Engineer.

SECTION OF FINE HILL DAM 40 FEET BELOW THE SURFACE