

since 1913 and where posts could not be driven) but at the northerly angle thereof, except on correction lines, the lines between different systems of survey, the outer limits of the roads around Indian reserves, and generally all lines the posts on which marked the boundaries of lands on one side only of the line, in which cases the post was to be placed in the centre of one side of the base of the mound. Up to 1915, in which year some posts were still placed as above described, no change was made in the instructions in this regard.

Iron posts with tins on which were marked the numbers of the sections were placed in the centres of the mounds at section corners on the prairie from 1882 to 1889. Instructions issued for the season of 1887 were to the effect that no more earth mounds, but pits only, were to be erected on the prairie; the practice of erecting earth mounds was not, however, entirely discontinued for some time. The manual issued in 1890 called for iron posts and pits only at section corners on the prairie.

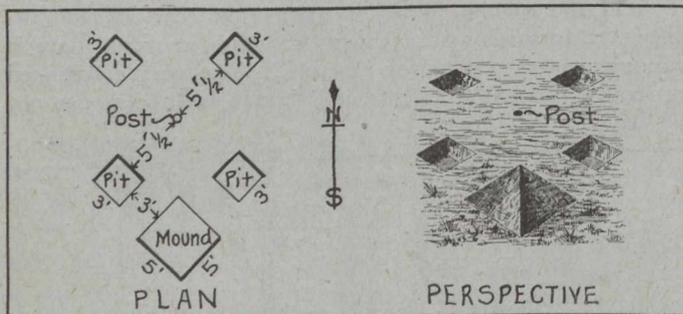


Fig. 3.—Monument to be Erected at Ordinary Township, Section or Quarter Section Corners in Wooded Country, 1916.

In wooded country no mounds or iron posts were called for by instructions until 1890. After that date the instructions for the positions of iron posts at section corners with respect to the mounds were similar to those mentioned above for township corners. (See Fig. 1.)

Up to 1881, where wooden posts and mounds were used, the instructions called for the posts to be placed in the centres of the mounds. From 1882 to 1889 wooden posts were to be used at quarter section corners only, and where used in connection with mounds were to be placed in the centres. From 1890 to 1900 inclusive wooden posts were still used at quarter section corners only, but were to be placed in the same relation to the mounds when erected, as in the case of iron posts at township or section corners. Since 1908 no wooden posts have been used except in muskegs, sloughs or shallow lakes.

The directions now given surveyors for the establishment of monuments of original surveys have been in force since about the middle of the season of 1915. Prior to that date it was the practice to have a mound, when erected, occupy a position midway between the four pits, in which case a post planted at the northerly angle of the mound was *not* in the desirable position of midway between the pits, formerly the most permanent part of the monument.

A boundary monument now generally consists of a standard survey post placed with its bronze cap flush with the ground. It is planted midway between four pits or in the centre of a circular trench with or without a mound. (See Figs. 2 and 3.)

The standard survey post, weighing seven pounds, consists of a piece of one-inch butt-welded iron pipe, 30 inches in length, filled with concrete. A malleable iron

foot plate $3\frac{1}{2}$ inches in diameter, and a bronze cap $2\frac{1}{2}$ inches in diameter, are fastened to the bottom and top of the post respectively. By such an arrangement and due to the fact that the cap is flush with the ground the chance of the post being removed or displaced is very small, indeed.

A pit is still to be made three feet square and eighteen inches deep, and as in the past, when pits only were dug, the nearest edge of the pit is to be $5\frac{1}{2}$ feet from the post.

When, however, a mound is now erected it generally occupies a position such that its centre is about ten feet due south from the post marking the corner. For any corner the mound is to be made five feet square, as has been the case in the past for section and quarter section monuments, but mounds at township corners were formerly made six feet square.

There is now, for the first time in the history of D.L.S. monuments, no difference whatever in the character of monuments marking township, section or quarter section corner. Legally it is understood no distinction is made between a quarter section corner or a township corner; each is equally important. It is fitting, therefore, that monuments marking different corners should differ only as to the markings on the posts and not as to their general character.

STEEL PIPE CONDUIT AT LOCH RAVEN, MD.*

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THE city of Baltimore, Md., has been making extensive improvements in its water supply during the past three years. The old supply was inadequate in quantity and its quality was of such nature that it was a menace to the health of the city. In order to increase the available water supply it was decided to build an impounding reservoir on the Gunpowder River, the stream from which the supply was taken before the improvements were begun. It was further decided in order to improve the quality of this water to install a filtration plant. The new dam has been completed and the filtration plant is now in operation.

In addition to these two main propositions, there were a number of supplementary works which were of considerable magnitude, including the building of five miles of road, one bridge 600 ft. long, another bridge 1,000 ft. long and the construction of a number of conduits which were 48-in. and 60-in. cast iron pipe, 7-ft. and 10-ft. steel conduits, and 7-ft. and 9-ft. reinforced concrete conduits.

The 7-ft. and the 10-ft. steel conduits have just been completed. The 10-ft. steel conduit is about one-half mile long and connects the waters of the new Loch Raven dam with the existing Loch Raven-Montebello Tunnel, which is approximately 7 miles long and 12 ft. in diam.

There have been great improvements in the building of large steel conduits in the last few years, introduced in the building of the aqueduct leading the water from the Catskill Mountains to New York City.

In steel pipe lines protected with various paints, asphalts and enamels, trouble has been experienced with corrosion, tuberculation and pin-hole leakage. In order to overcome these difficulties the engineers of the New York Board of Water Supply after a number of experi-

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*Abstract of article in The Cornell Civil Engineer.