July 7, 1917.

Hon. Simon Bamberger,
Governor of Utah,
Capitol Building,
City.

Sir:

I am transmitting herewith my report on the failure of the Mammoth Dam.

Respectfully yours,

State Engineer.

July 7, 1917

REPORT ON THE FAILURE OF THE MAMMOTH DAM

The Mammoth dam is situated on the southwest quarter of Section 6, T. 13 S., R.6 E., twelve miles east of Fairview, Utah, and is owned by the Price River Irrigation Company of Salt Lake City. The officers of the company are

Geo. Austin,	President
Geo. A. Smith,	Secretary
T. R. Cutler Mark Austin Ira D. Winis Thomas Austin J. H. Leautand	Directors
J. C. Wheelon,	Chief Engineer.

The dam was approximately seventy-two feet in height, of earth construction, with a concrete core wall founded on bedrock.

The reservoir covered an area of 349 acres with a watershed area of 12,115 acres, the elevation at the dam being 8,600 feet above sea level.

The waters impounded in the reservoir flowed down Gooseberry Creek, thence into Fish Creek in Pleasant Valley a few miles below Scofield, thence into the Price River near Colton, and thence down the Price River to the company's diversion dam between Helper and Price. From the diversion dam the waters were carried in the company's main canal for a distance of about twelve miles and used for the irrigation of about twenty thousand acres of land lying south and east of Price.

On June 27th, Mr. H. S. Kleinschmidt, representing the Engineering News Record, J. L. Rhead, engineer on the Piute project, and myself proceeded to the dam, took numerous measurements and photographs of the wrecked structure, and after remaining there over night, arrived back at Fairview the next day, or June 28th.

We then interviewed M. P. Christenson, who was in charge of the dam for the company, and Andrew Hall, watchman at the dam at the time of the break.

I find the following to be the facts in the case:

The concrete core wall was raised five feet in the Fall of 1916.

The earth fill was about five feet below the top of the core wall on the up-stream side and ten feet below the top on the down-stream side.

The top width of the dam was 160 feet, and the top length about 440 feet, the unusual top width being caused by the fact that the company expected to raise the dam about 50 feet to a total height of 125 feet. The core wall was located on the axis of the dam.

At the junction of the up-stream slope and the top of the dam, an earth dyke had been erected eighty feet up-stream from the core and parallel to it, the top of this dyke being two feet higher than the top of the core.

The water in the dam was two feet ten inches below top of earth dyke, or ten inches below the top of the core wall.

A wooden flume had been constructed, extending from

the dyke to a rectangular notch in the core, the flume being 2'6" deep, 10 feet wide, and eighty feet in length, this flume being intended to carry flood waters from the dyke to the core wall, thence over a vertical drop of 6'6" into a temporary wooden spillway butted against the lower side of core. This flume was laid through the earth dyke without any bulkheads or cut-off walls.

On Sunday, June 24th, Watchman Hall left the dam at 11:00 A.M., and went to lunch at the bunkhouse, about a thousand feet distance. On his return, two hours later, the water had broken through the earth dyke along the side of the temporary flume, had filled the intervening space between the dyke and the core wall, and a section of the core, about five feet high and thirty feet in length, had fallen outward, allowing the water to pour through this breach onto the earth fill forming the lower half of the dam. As the earth washed away, leaving the core unsupported, sections of the core continued to fall until seventy-five per cent of the dam had gone out and the reservoir emptied.

I am advised by Supt. Christianson that there was no unusual flood condition on the day of the break; that the level of the reservoir was stationary or, if anything, falling slightly; that no water was passing through the flume; that he had nailed three six-inch boards across the upper end of the flume forming a bulkhead eighteen inches high; and that the water level was four inches below the top of the bulkhead.

A review of the situation shows that this dam failed, first; because the flume portion of the spillway was improperly and inadequately constructed, second; because the horizontal

reinforcement in the core wall had been stopped twelve feet above the base instead of being carried to the top of the core, third; the first section of core wall to fail sheared off at a point five feet below the top, indicating that the bond between the older section of the wall and the five-foot raise made last year was not what it should have been, and fourth; because the management deliberately permitted the level of the water in the reservoir to rise to within ten inches of the top of the core wall contrary to all precedent, and against all engineering practice.

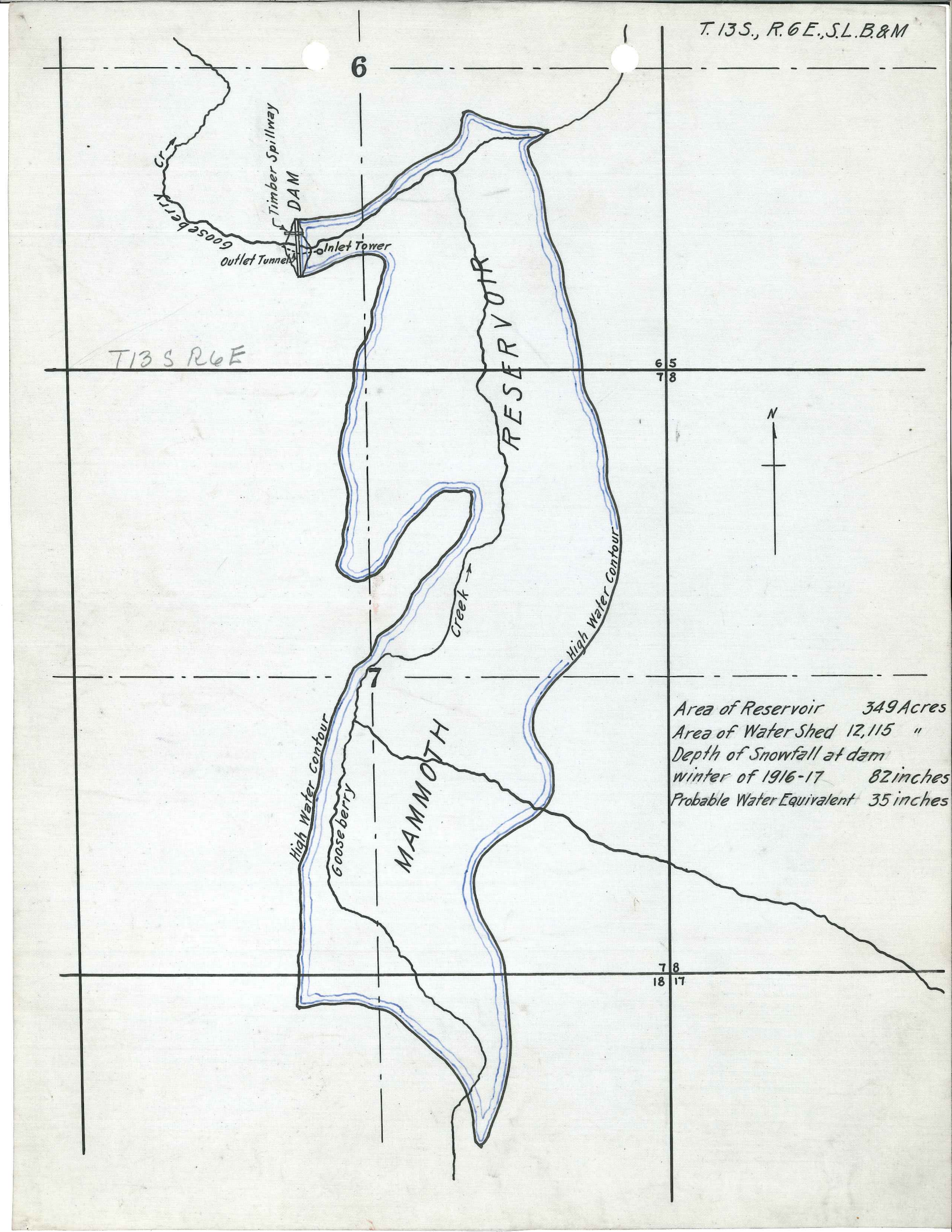
If the water level had been maintained five feet below the top of the core wall, the dam would still be intact.

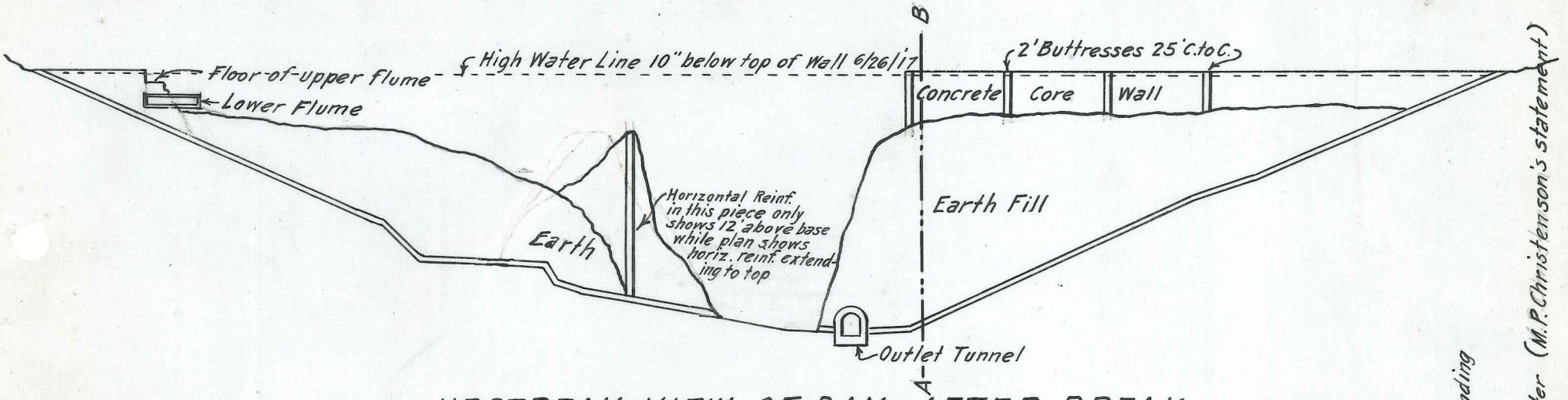
There is absolutely no evidence to indicate that the dam was tampered with by outside parties.

Maps, photographs and drawings are herewith attached.

Respectfully submitted,

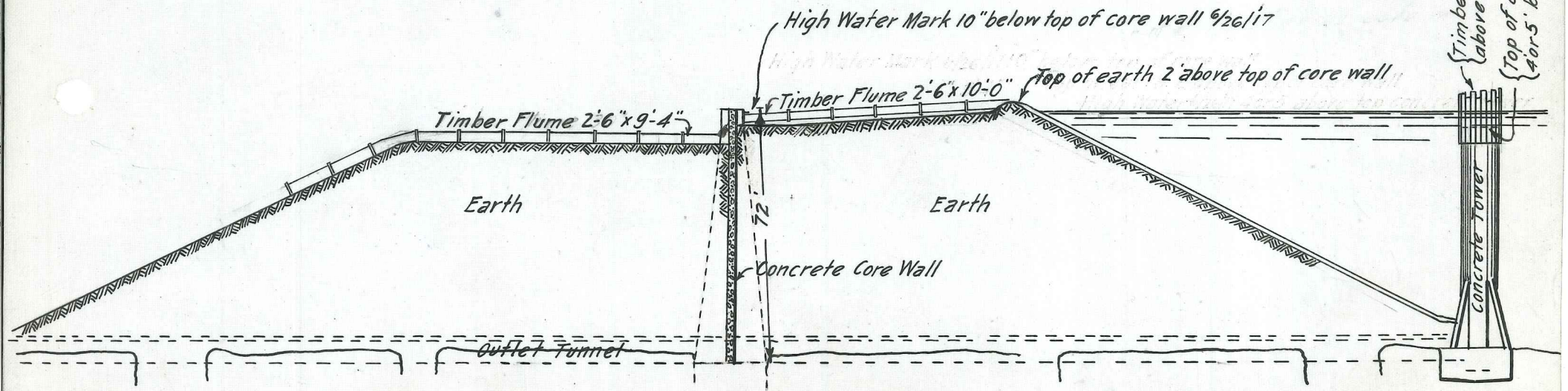
July 7, 1917. State Engineer.


T. 13S., R. 6E., S.L.B.&M
6
Timber Spillway
DAM
Cr.
Gooseberry
Outlet Tunnel
Inlet Tower
RESERVOIR
T13S R6E
6 5
7 8
N
Creek
High Water Contour
7
High Water Contour
Gooseberry
MAMMOTH
Area of Reservoir 349 Acres
Area of Water Shed 12,115 "
Depth of Snowfall at dam
winter of 1916-17 82 inches
Probable Water Equivalent 35 inches
7 8
18 17



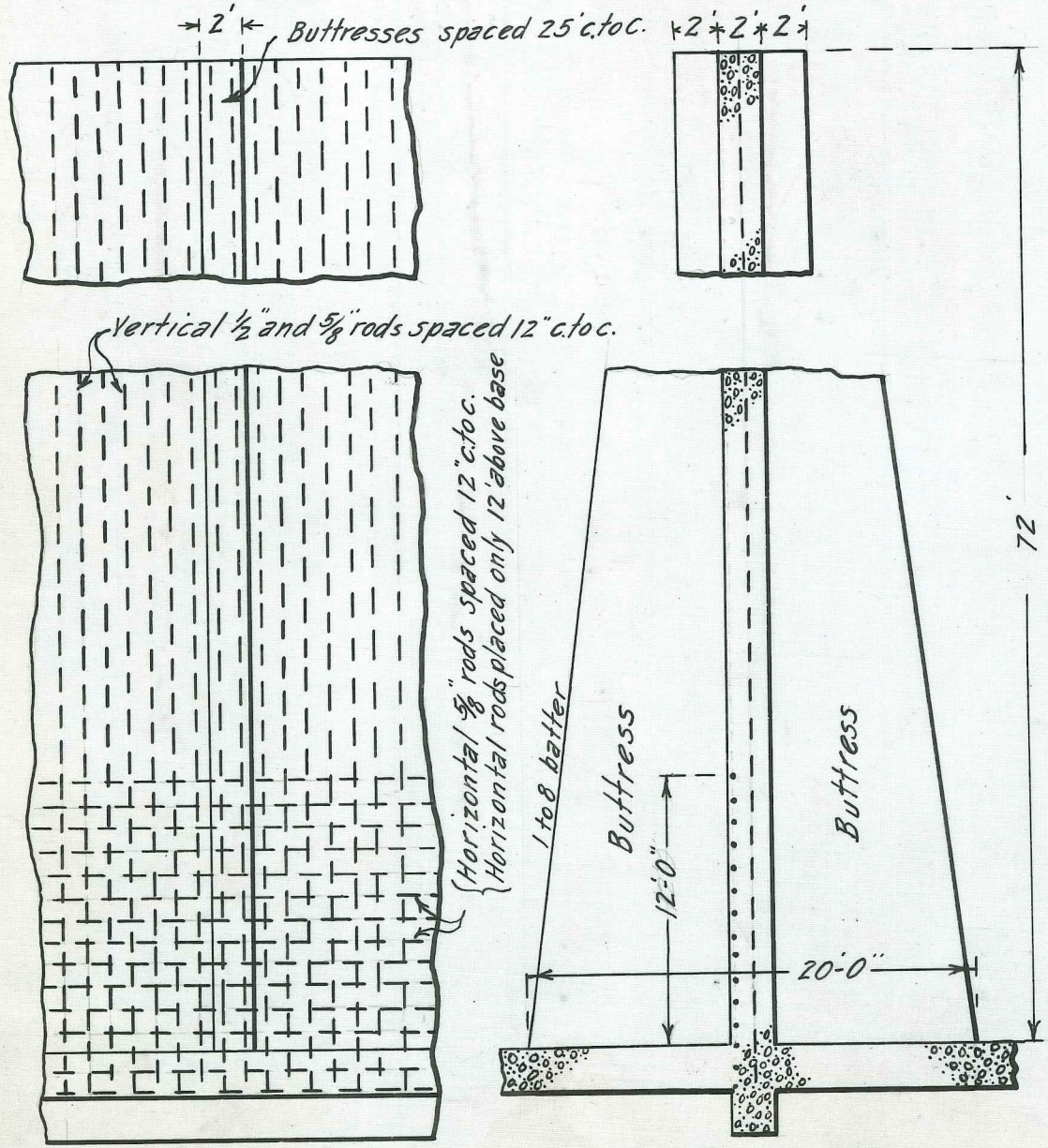
UPSTREAM VIEW OF DAM AFTER BREAK

Scale 40'=1"



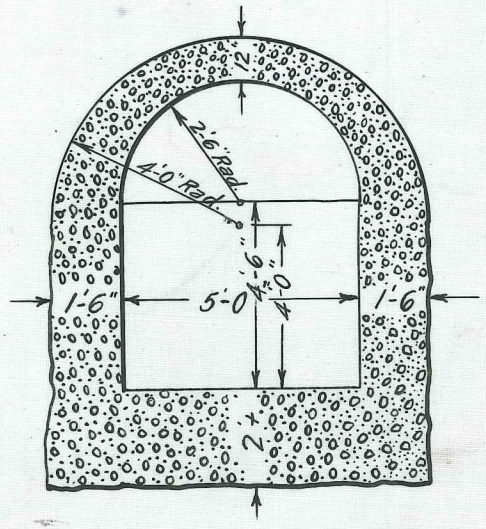
SECTION A-B SHOWING CONDITIONS BEFORE BREAK

Scale 40'=1"



CORE WALL

SECTION OF CORE WALL



SECTION OF OUTLET TUNNEL

Scale 4'=1"