an old river channel, the summit of which is only 95 feet above the river bed and about 600 feet from the same. A stream known as the Mat-zi-win Creek has its source in the valley above referred to; and this is the natural boundary between the lands served by the two main branches of the system.

This project as outlined from the surveys takes advantage of a low pass in the watershed referred to, to take water from the Bow River by an intake located at the Horseshoe Bend. A dam is being built across the river at this point, which performs two functions. First, it will raise the water level at the intake, thus enabling the system to command a much larger area of land than it otherwise would have done; and secondly, it reduces the quantity of material to be removed from the main canal heading at the dam. At this point the ordinary low water level elevation is 2,515. The elevation of the canal headgates will be 2,549.6, and normal depth of water in the pool will be 11 feet higher, or 2,560.6. The dam is to be a composite structure, consisting of a long and high earthen embankment on the west bank of the river, and a reinforced concrete spillway in the existing river channel, connected at its easterly end with the canal headgates. Just above the site of the dam the river makes a long bend in the shape of a horseshoe, which gives the locality its name, the dam being located at its toe. At this point the river is approximately 600 feet wide, its north or left bank having a narrow bench immediately at the water's edge and only a few feet above it, beyond which is a cut bank rising over one hundred feet above the bed of the stream. The west or right bank has a gravel beach rising gradually until it forms a tongue between the two legs of the horseshoe. This tongue has a broad flat top several hundred feet in width and rising gradually to the general prairie level, its general elevation near the river being about 25 feet above the bed of the stream.

On this tongue an earth dam is now under construction, to which the spillway structure will be joined. This embankment will have a maximum height of about 45 feet, a total length of about 7,000 feet, and at its highest point is 310 feet in width at the base. Its wetted slope is 4 to 1, and dry slope 3 to 1, the top width being 32 feet, with a free board of 9 feet above normal water level. Provision has been made for under-drainage by a wooden box filled with boulders and gravel with suitable offtakes, and its upper slope will be paved with concrete slabs. It will contain about one million cubic yards, which material is being transported from the excavation from the main canal across the river over a double track timber trestle. The foundations of this dam consist of a deposit of river silt overlying coarse gravel and boulders, which in turn overlie dense blue clay.

The spillway referred to is designed to pass over its crest 100,000 second feet without raising the surface of the pool above elevation 2563.6, or 14 feet over the crest, which required a free length of weir of about 600 feet. To allow for end contraction on account of the piers necessary to support the movable crest, a clear length of 650 feet between piers was decided on.

As the crest of the dam and the sills of the canal headgates were fixed at elevation 2540.6, the additional depth of 11 feet for which the canal was designed, had to be maintained by some form of movable crest for the entire length of the spillway in order to pass extreme floods. This movable crest will be divided into 24 sections, and supported between piers giving 27 feet clear spans, and these openings will be regulated by structural steel gates, of the well-known "Stoney" type. In the determination of the spacing of the buttresses due consideration was given to the effect upon cost of construction, the time required to build the structure, and to the limitation in length of the gates corresponding to the spacing of the buttresses; with the result that these are to be at 15 centres, with every second buttress carried up in the form of a bridge pier. Emergency gates will also be provided in case of necessary repairs having to be made to the main gates.

The spillway proper is a reinforced concrete structure of the so-called "Ambursen" type, consisting of a heavy floor built upon the bed of the stream, and upon this floor are erected parallel buttresses of substantially triangular outline, having a slope on the upstream edge of about 45 degrees. Upon brackets or haunches projecting from the faces of the buttresses and parallel to the upstream edges, is built a concrete slab forming a deck, terminating at the top of the buttresses in a curved crest, and passing down over the downstream edge of the buttresses in the form of an apron suitably curved to correspond as nearly as possible to the path of the overfall flood waters. In front of the dam the floor is being carried downstream a distance of about 75 feet, forming a tumbling hearth. In general, the cross section of the spillway is what is known as the Ogee section, and consists of constructing the downstream face of the dam between the crest and the floor in the form of a reverse curve; the lower edge of this curve being tangential to the floor of the structure, so that the overfalling nappe shall be let down the face of the dam and turned into a horizontal direction parallel to the river bed with the least possible disturbance.

The spillway is founded on a deposit of sand, gravel and boulders, overlying a thick stratum of stiff blue clay.

At the upper and downstream edges of the structure heavy cut-off walls are carried well down into the clay and bonded to the body of the carpet. A concrete apron extends about 12 feet above the upper cut-off wall, and boulder concrete will be placed in the river bed for some distance below the tumbling hearth.

The structure is to be 720 feet in length between abutments, with a maximum height of 40 feet to the overflow crest, above which 11 feet of water will be retained by the gates above referred to. It will contain about 40,000 cubic yards of concrete, and 2½ million pounds of reinforcing steel.

(To be continued.)

BONUS FOR THE PRODUCTION OF QUICKSILVER.

The Mines Department of New Zealand, has recently sent out a notice regarding a bonus for the production of quicksilver. We are indebted to Mr. Egerton R. Case, patent attorney, Temple Building, Toronto, for furnishing us with a copy.

Notice is given that a bonus of fourpence (8 cents) per pound will be paid on the production of the first one hundred thousand pounds weight (100,000 lb.) of good marketable retorted quicksilver, free from all impurities, from any mine in New Zealand, on the following conditions:—

That at least one-third of the quantity is produced on or before the 31st March, 1914, and the remaining two-thirds on or before the 31st March, 1915.

No bonus will be payable until the whole of the one hundred thousand pounds (100,000 lb.) of quicksilver has been produced as stipulated to the satisfaction of an officer to be appointed by the Minister of Mines, and on whose certificate alone the bonus will be paid.

In the event of more than one person producing the required quantities of quicksilver before the dates named, inquiry will be made by the officer above referred to, when, if it is found that each applicant is equally entitled to a bonus, the amount will be divided in proportion to the quantities produced by each applicant, but in no case shall any bonus be paid until at least one hundred thousand pounds (100,000 lb.) of quicksilver has been produced in the aggregate.