incurring the risk of its running back into the channel.

The excavation could be done in three seasons. The Canadian hydraulic dredge, 'J. I. Tarte,' excavated during working season of 1907, and removed by pipe line, two million yards of material in the St. Lawrence below Montreal.

The line passes through Ile Bourdon in 35 feet cut, and this material will prove harder excavation than the channel below and above, although a good part of it can be done dry.

At this point the Chateauguay and Northern railway (Great Northern) is crossed, and a bascule double track bridge has been estimated for, leaving a clear water-way of 160 feet. About mile 8 the excavation becomes rock and continues so for the next half mile up to Prairies lock.

The line is generally direct, but bends, none of which are sharp, are necessary at four places to get between the numerous islands. Each leg is provided with range lights and mark piers so as to render navigation fully as easy as in the ship channel.

At mile 5 the St. Eustache branch of Mille Iles river joins the Back river, but without appreciable current. The manufacturing town of Terrebonne is situated 11 miles up this branch.

The end of Montreal island (Bout de l'Ile) is a triangular flat, elevated about 35 feet above the sea for a distance of two miles. The ground then runs up quickly to elevation 75, and continues to rise toward Mount Royal. Examination failed to discover any practical crossing between Bout de l'Ile and Ste Anne —the west end of Montreal island.

To cut through the island and join the St. Lawrence ship channel at the head of Ile Ste. Therese would be somewhat more expensive than the route as estimated. The saving in distance between the short cut and the adopted line, Montreal customs house would be about 6 miles in distance, but nothing in time of transit owing to reduced speed through canal cutting.

Prairies Reach.

The lock or step up to this reach is located on the north shore opposite des Prairies village, its lift being 24 feet from surface elevation 16 to surface elevation 40. A greater rise than this would flood the village property, and the damage might be considerably increased by the erosion of the soft earth banks along the south side.

The Prairies lock is founded on rock, the surface of which is elevated 20 feet, so that the walls for 26 feet in height are formed in the natural bed-rock. The remaining 25 feet in height of wall are built of concrete in a similar manner to all the other locks. About 3,000 cubic yards of concrete will be required for this, and part of the lock-pit excavation can be used.

The usual guide piers are provided above and below the lock. The upper guide pier forms a side wall to a short canal along the river bank.

There is a rock-fill dam between the lock and the south shore, which will require 100,000 cubic yards of loose rock.

The rock excavation immediately below the lock can be dammed off the excavated dry at the same time as the lock-pit, and will furnish ample material for the filling of guide piers and the dam.

Stop-log sluiceways are provided in the dam to pass the flow of the river. There are 14 openings, each 20 feet wide, and capable of passing 20 feet depth of water, and even 24 feet depth if the reach above should rise by accident. The regulated flow through Back river is 65,000 c.f.s., and 25 per cent additional is provided.

About a mile above the lock a straight channel will require the excavation of about 21,000 cubic yards of rock, which can be taken out dry.

Further up the channel, about two miles above St. Vincent de Paul, nearly 850,000 cubic yards of rock excavation is required extending right to the foot of Recollet lock-mile 17.

This heavy rock excavation is necessary so as to enlarge the river bed and prevent a current swifter than four feet per second for the total flow of 65,000 c.f.s.

The river now flows with considerable current, but with little depth, a rough limestone bed-rock. The proposed raised surface or working level will just obliterate the sloping fall of the river past Visitation island, and so destroy the current, without increasing the depth. It will, therefore, be necessary to increase the size of the river. To accomplish this a channel 700 feet wide will be taken out south of Visitation island to allow a flow of 10 feet in depth. This can be excavated dry. Part will be earth 54,000 cubic yards, and part rock, 202,000 cubic yards. The village property destroyed is often flooded, and so no great damage will be done. This channel could be excavated by three shovels in two seasons, working winter and summer.

The navigation channel north of Visitation island is full 300 feet wide, and excavated 7 feet into the rock river bed for a distance of about 1½ miles below Recollet lock. This can be closed off by dams from shore and excavated dry, especially as most of the river flow will be passed south of Visitation island. Three seasons will be required to complete this channel, that is one season after the channel south of Visitation island is finished. The water surface at Prairies lock will be raised about 15 feet and extend level to Recollet lock, where the surface will be as at present. There will be 368 acres of land inundated. The north bank from St. Vincent de Paul upwards is very steep and the south shore is fairly high but it may be necessary to protect parts of it by a stone slope, ample rock for which is available from the excavation.

A small water-power at Prairies lock will be extinguished and also that between Ile Visitation and the south shore where a small cardboard factory is now in existence.

Recollet Reach.

Recollet lock is on the north side, a mile below Pont Viau, the lift being 35 feet, which attains the level of Oka reach. It will be noted that only two locks are required to rise to Oka level by the Back river, while the front line requires three locks, as a small lift seems absolutely necessary at Ste. Anne.

Recollet lock is founded on solid rock, the