Another section of the by-law outlined the work to be done to reclaim these lands:

> *"(the properties) which are more fully described in the said Petition, might be drained, reclaimed and usefulness improved by means of:*
>
> *1) a drain or drains.*
>
> *2) Deepening, straightening, widening, clearing of obstructions or otherwise improving the stream or watercourse, known as the south portion of the Holland River, and the tributaries of the said portion of the said River in said Townships in the said described area.*
>
> *3) Lowering the waters of said south portion of the Holland River, or diverting the course and waters of same and its tributaries, by a system of dredging, embankment and pumping or other mechanical operations or by any or all of the said means."*

King Township Council took exception to the passage of this by-law by West Gwillimbury for four reasons: (1) that the scheme will not be successful; (2) that West Gwillimbury should not be permitted to do work in King Township; (3) that the work cannot be successfully carried out for the estimated cost; and (4) the assessment should apply to the whole of the lands owned and not just to the part of the lot being affected. Based on these four points King Township appealed the approval of the by-law almost immediately. The matter was referred to Mr. George Henderson from Ottawa, the Drainage Referee for Ontario. It was not until March 4, 1925, one year later, that his considered decision to dismiss King Township's appeal was handed down. King Township now had no alternative but to proceed with the sale of the debentures and co-operate with West Gwillimbury in implementing The Scheme.

As a last reminder of their being unwillingly drawn into The Scheme the King Township Council at their April 10, 1925 meeting instructed their clerk :

" to write to the Clerk of West Gwillimbury Township, a letter, registering the same, and inform them that this municipality insists upon written approval of the Department of Public Works (Ottawa) and the Department of Lands and Forests (Ontario) being placed on file with our clerk before the municipality shall offer for sale any debentures in connection with the Holland Marsh Drainage Scheme and that a copy of this resolution be sent to the Clerk's Office of the Counties of York and Simcoe."

King Township delayed the sale of debentures until November of 1926. This delay meant that West Gwillimbury had to borrow funds to pay King's share of the costs that were being incurred in starting up the project, as the tender had been let and work was underway. This added a contentious additional cost to the project. King Township had also been assessed $2,120.84, the costs of the appeal to the Drainage Referee, and King had added this amount to their share of the costs of The Scheme, thereby adding further to the landowner's costs. Both of these additional costs were contested by the marsh land owners in King Township in a later court case. In the article that appeared in the Canadian Engineer in 1925 Prof Day observed that the two members of King Council responsible for appealing By-law No. 595A were defeated in the 1926 election. In due course King became a willing partner in The Scheme once these initial problems were resolved.

In early April of 1925 West Gwillimbury Council advertised for tenders and seven companies responded. The successful bid of Cummins and Robinson of Toronto was accepted at the Council meeting of May 16, 1925 on the following motion:

" that the tender of Cummins and Robinson be accepted subject to the disposal of any motion to quash the By-Law and that the Engineer, Alex Baird, and our solicitor be instructed to prepare the necessary contract of work."

The tender price quoted by Cummins and Robinson was $137,000, $6,230 more than Baird's estimated price of $130,770. A year and a half after West Gwillimbury Council had passed By-Law 595A the construction of the Big Scheme was about to get under way. Cummins and Robinson were the contractors, Baird was the overseeing engineer and Professor Day was here there and everywhere keeping tab on daily progress.

Between the time when the petition was approved by West Gwillimbury Council in January 1924 and the engineer had filed his report in June of that year a delegation of members from the Councils of Bradford, King and West Gwillimbury had travelled to South Western Ontario to see first-hand some of the drainage projects that were similar to the proposed Scheme. In particular they viewed the Pike, Dauphin, Forbes and Burke Schemes in Kent and the Point Pelee in Essex. This experience gave the Council members a better understanding of the work involved, the expenses and the results that they should expect.

THE PLANS FOR THE BIG SCHEME

The Holland Marsh Drainage Scheme, The Big Scheme, was no small venture. Nearly a million cubic yards of muck and clay would be moved. Seventeen and a half miles of canal and embankments would be dug and built; one hundred and eighty acres of bush, scrub trees and alders would be cleared, three dams would be built and a pumping station would be put in place with operating pumps capable of moving 40,000 gallons of water per minute. At one time more than one hundred men were employed on the project. The framework for The Scheme was laid out by Alexander Baird in his report to Council. His report provided the plans,

the details of the work to be done and the construction methods to be followed in order to complete The Big Scheme.

In the preamble of the report Baird stated the task as follows:

> *"For the construction of a Drainage Scheme for the reclaiming and draining of a portion of the South Part of the Holland River Marsh in the Township of West Gwillimbury and in the Township of King, by means of an embankment and pumping."*

He stated that the work to be done *"embraced:"*

> *"The system or works to be performed consists of and embraces the excavation of the Drains, or Dredge Cuts, shewn on the plan and profile of the work, forming the earth excavated there from into continuous Embankments along the Drains, or Dredge Cuts, doing all necessary clearing, grubbing, pile work, building such bridges as may be required, flumes, pump beds, pumping station, engine and boiler foundations and furnishing all necessary materials for same. Providing and placing in position one steam boiler and one engine, or such other power machinery as may be decided upon for running and operating the pumps. Two submerged centrifugal pumps of 40,000 gallons per minute capacity and furnishing all material and work necessary in connection with same.*
>
> *The whole to be complete in every way, put in position, properly built, erected, fitted and coupled up ready for regular use, to the entire satisfaction and approval of the Engineer in charge of the work."*

He estimated the cost to be:

Excavating the canal	$ 85,998.30
Clearing and Grubbing	1,000.00
Damages to lands	2,107.50
Allowance for Bridges	1,475.00
Allowance for providing Dredge	10,000.00
Pump house and equipment	8,000.00
Pile work and Dams	1,960.20
Site for pumping station and access	200.00
Survey, plans, specifications	2,500.00
Assistance in survey and expenses	1,200.00
Publishing By-law - WG	100.00
Court of Revision WG	20.00
Clerk's fees WG	150.00
Publishing By-law - King	100.00
Court of Revision - King	20.00
Clerk's Fees - King	125.00
Publishing By-law - Bradford	25.00
Court of Revision - Bradford	20.00
Clerk's Fees - Bradford	19.00
Service of Plans, report etc.	20.00
Letting and Superintending	5,730.00

Total	$ 130,770.00

Baird's estimate of $85,998.30 for the excavation was based on excavating 859,980 cubic yards of material @ 10 cents per cubic yard. The tender price came in at $137,000, $6,230 more than estimated cost. By the early 1930's additional costs of $15,000 for legal and professional engineering fees increased the cost to

$152,000. The final tally was $197,000. The original estimate of the reclamation project was $18.00 per acre. This acreage cost was to increase to $23.00 per acre before the project was completed. The total cost was reduced by the 20% grant that came from the provincial government under the Municipal Drainage Act.

One schedule in Baird's report provided the location of each property, the owner, acreage, the value of the benefit and the annual pumping cost. The location is described as lot or part lot in a concession; the acreage is in acres, the value of benefit is the acreage multiplied by the $18.00 per acre cost and the pumping fee is 10 cents per acre per year. For example Mathew Brandon the owner of the S1/2 of lot 5, Con 1 West Gwillimbury owned 99 acres, the value of benefit, the acreage times $18.00 acre, is $1,782, and the annual pumping fee was $9.90. Mr. Brandon was assessed each year 1/30 of the value of benefit, $59.40, plus the pumping cost, $9.90, for a total annual levy of $69.30. In addition there was the annual tax bill on the property. The road allowances, 64 acres in West Gwillimbury and 98 acres in King, were also assessed, the levies paid by the respective Townships to the Drainage Scheme.

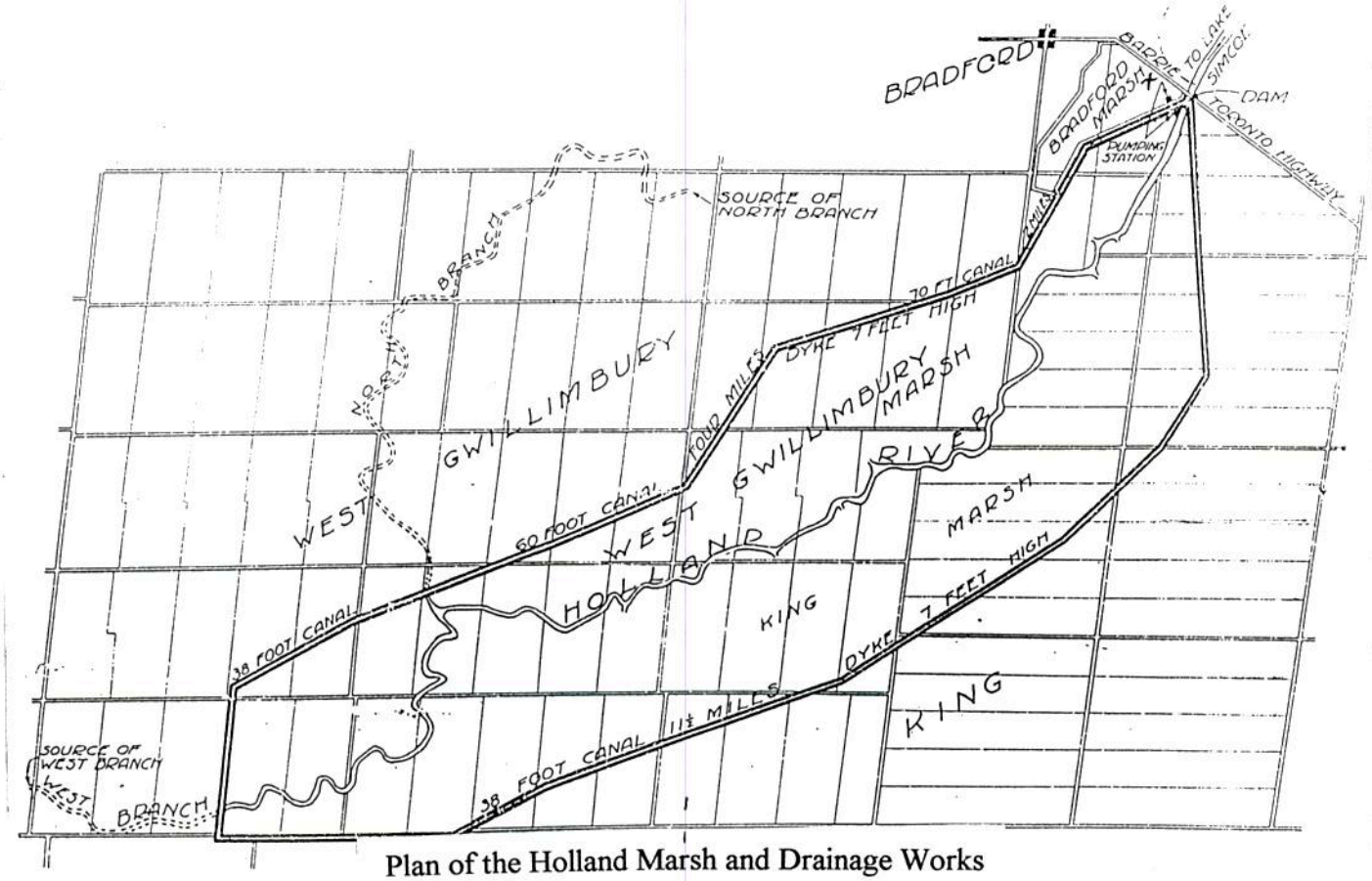
These costs on a Township basis broke out as follows:

	Value of Benefit	Share of cost	Pumping Cost
West Gwillimbury	$ 52,281	40.0 %	$ 290.45
King	$ 76,663	58.5 %	$ 425.91
Bradford	$ 1,825	1.4 %	$ 10.14
Total	$130,770	99.9 %	$ 726.50

The only figures on this table that have remained the same are the figures in the share of cost column. The costs of maintenance and improvements are split on these percentages to-day.

It was also the responsibility of the Engineer to lay out the plan for the work to be done and specify the details. He provided the plan for the alignment of the canals and the specifications for the width and depth for the seventeen and one half mile channel. His plan called for the first two miles of the canal, commencing at the Holland River and heading west to be seventy feet wide at the top with sloping sides to a width of forty feet at the bottom. This section would end where Simcoe Road now meets the canal at Jonkman's Corners. The next four mile section would end at the North Branch of the Holland River and was to be cut sixty feet wide at the top with sloping sides to a forty foot width at the bottom. These two sections of the canal were wider because they would carry the flow from the North Branch of the Holland River and the drainage waters from the highland to the main body of the Holland and then on to Lake Simcoe. The next eleven and one half miles of the canal were to be cut 38 feet wide at the top with the sides sloping to a width of twenty feet at the bottom.

The embankment, which we now call the canal bank, was to constructed as a continuous earthen bank on the marsh side of the dredge cut. There was to be a six foot clear space between the edge of the embankment and the dredge cut. The embankment was to be thirty eight feet wide at the base, seven feet high and eighteen feet wide at the top. Care was to be taken that no trees, logs stumps or brush were covered, and the excavated material was to be "uniformly deposited in order to leave a clear berm". The excavated material could be deposited on both sides of the dredge cut in the seventy and sixty foot wide sections but there was to be allowance for drainage outlets into the canal and road access for bridge crossings. It is interesting to note that the embankment measurements are similar to the canal cut, remembering that in the wider sections the earth could be deposited on both sides of the new canal. With this plan there was no excess earth that had to be moved away from the site.



Plan of the Holland Marsh and Drainage Works

The main dam across the Holland River was to be built where the two embankments met at the north end of The Scheme near the Highway 11 bridge. The specifications and the method of construction of the dam are included in the Baird report. Mention is also made of the need to protect the embankment with sheet plank piling where the flow from the North Branch and the Holland (Schomberg) River are diverted into the Canal.

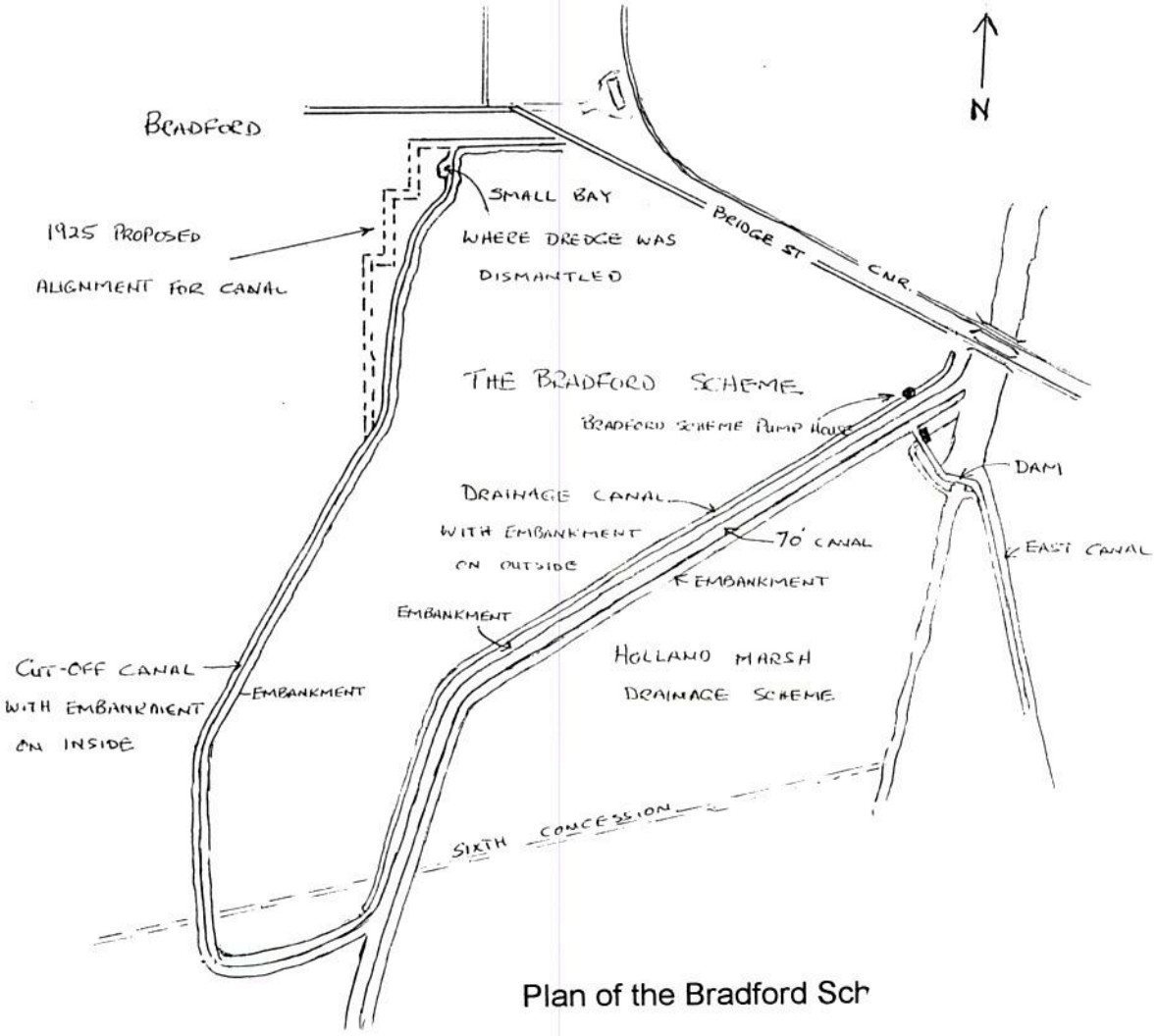
The pump house to house the steam driven pumping equipment was to be installed at the north end of the drainage system adjacent to the dam. There were to be two pumps each capable of discharging 20,000 gallons per minute that would move the water from the interior river channel over the dam or embankment

into the main river. The Holland River channel, now enclosed by the embankments, was a reservoir to receive the waters draining from the marsh. The pumps would control the level of this reservoir.

Alexander Baird was seventy years of age in 1925 when this project got underway. He continued to supervise this project until the spring of 1927 when he had to retire because of ill health. During his time of service he was assisted by his son John who was also an engineer and associated with his father in their Sarnia office. Alex Baird was replaced by George McCubbin whose appointment was confirmed by West Gwillimbury Council on April 27,1927.

THE BRADFORD MARSH DRAINAGE SCHEME

The original plan included the small Bradford Marsh in the Holland Marsh Drainage Scheme but it was found that three townships could not legally be involved in a municipal drain petition. This was not discovered until after the original petition had been presented to West Gwillimbury and Baird had been appointed as the engineer. Professor Day was the major owner in the Bradford Marsh so no time was lost in presenting a petition to the Village of Bradford to set up what became known as The Bradford Scheme, The Little Scheme. This Scheme covered that portion of the Marsh that lays within the municipality of Bradford and is north and west of the large 70' canal.



Plan of the Bradford Sch

To this day the Bradford Scheme operates entirely separate from The Big Scheme. It has its own management team and does not come under the jurisdiction of the Holland Marsh Drainage Commission which oversees the rest of the marsh. Just to make everything neat and clean we must remember that the portion of the Town of Bradford, that lays south of the north canal and north of the sixth concession, is included in the Holland Marsh Drainage Scheme, The Big Scheme.

Alexander Baird had filed his report and with it in hand the land owners of the Bradford Marsh presented their petition to the Bradford Council on July 27th, 1925. Council approved the petition and passed the necessary by-law to borrow the funds, subject to the approval of the Ontario Municipal Board. The following motion of the Board approved the By-law on September 30th 1926.

> *" By-law No. 510 - a by-law to provide for drainage work in the Village of Bradford, in the County of Simcoe and the Province of Ontario, and for the borrowing on the credit of the Corporation of the Village of Bradford aforesaid the sum of $7,050.00 as amended by the said By-law No. 520, be the same is hereby approved and validated."*

Baird estimated the cost of constructing the drains in the Bradford Marsh at $1,825.20 with a $10.14 annual pumping fee. He had made a slight error. He had based his estimate on 101.4 acres within the Bradford Scheme when in fact there were 200 acres. The by-law above authorized the borrowing of $7,050.00. The completed scheme costing $11,000.00 was eligible for the 20% grant from the provincial government leaving $8,800.00 to be levied back to the owners.

The original plan for the Bradford Scheme showed an alternative alignment for the canal in the north-west corner of the Marsh. This canal, which opened into the 70'

canal, came north along the edge of the marsh lands to Back Street, along Back to a point half way between Bingham and Anne when it turned north again to Centre. At Centre it again turned north on Anne to a point one lot south of the highway. Here it headed east until it met Bridge St. In 1926 there was no access to the embankment, which we now know as Morris Road, because of the canal. In later years this short leg of the canal that turned to the east was filled in and access was opened to Morris Road, the embankment, and to Centre St. by way of Anne St. When the canal was dug the plan changed to avoid the jogs and right angle turns. The new alignment was more easily constructed and maintained.

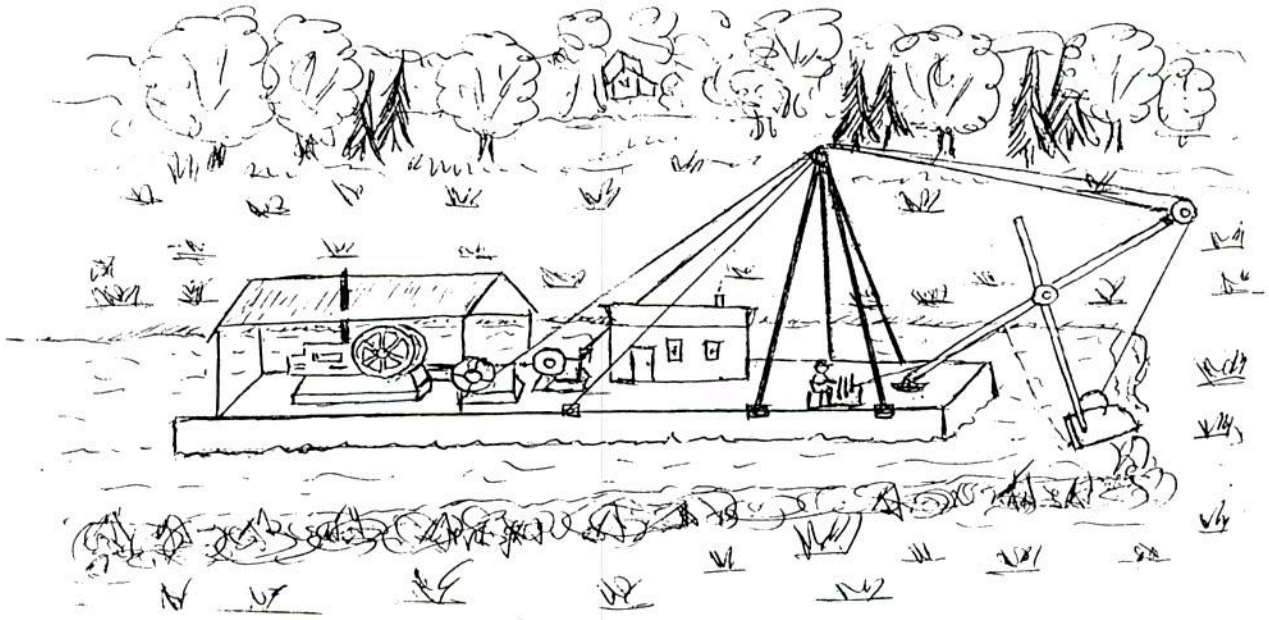
The canals in the Bradford Scheme were dug by the smaller dredge that was built alongside the Big Dredge, in the late summer of 1925. The machinery for this smaller dredge was mounted on a wooden barge ten feet wide and twenty-five feet long. It was powered by a gasoline engine and it worked only in the Bradford Scheme. The dredge was operated by Mike Somerville, the brother of the project manager, assisted by Ernie Peterman. The dredge commenced work in the fall of 1925 and worked as quickly as possible in an attempt to have the drains, embankment and canal completed so that land could be broken in the fall and a crop grown on the Bradford Scheme in 1926. This was not to be. The canals were not completed until the summer of 1926.

There are two canals for the Bradford Scheme. The drainage canal, the reservoir, starts near the river, but does not drain into it. It follows the alignment of the 70' canal, to the west and comes to a dead end where it meets the sixth concession right of way. The excavated material from the canal was piled beside the material from the 70' canal and became part of the embankment that runs between the two canals. The second canal, the cut-off canal, ran up the west side of the Bradford Marsh starting at the 70' canal, as described earlier. The embankment for this canal was built on the inside, the marsh side, so the canal could accept the water

from the town and highland and divert it around the marsh to the big canal and to the river.

When the dredge had completed the canal to Bridge Street it backed up to a point just south of Centre Street, where it dug a shallow bay. It then was moved into the bay where it was dismantled by the crew who could work handily in the shallow water. The many pieces were laid out on the bank to be taken by horse drawn wagons to the railroad station. This spot was a popular swimming hole for many years.

Before all the Bradford Scheme canal work was completed, the pump house and pump were in place by June 10th 1926 and were being tested. The pump was rated at 5,000 gallons per minute and was powered by an electric motor controlled by an automatic float switch which started the motor when the water rose to a certain level in the canal.



The Bradford Scheme Dredge

Prof Day Standing in front of the Bradford Scheme Pump House - 1929

The pump house was a round red metal shed about six feet in diameter, with a conical roof. There was a door and a window and it was set on a concrete foundation. The foundation for this shed is still in place immediately to the east of the present Bradford Scheme pump house. A corrugated steel pipe through the embankment provided the outlet to the river.

The pump did its job effectively allowing Professor Day to be on the marsh by mid July with a breaking plough.

The first attempt to break the matted surface layer of roots, soil and grass was made with an ordinary breaking plough pulled by a wheel tractor. This didn't work too well so the Professor arranged for the demonstration of a marsh breaking plough pulled by a caterpillar tractor. A few potatoes and some cauliflower were planted the last week of July of '26 with limited success because of the late planting and a very wet season. Progress was made and by freeze up in the fall the marsh lands of the Bradford Scheme had been cleared and broken ready to grow the first vegetable crop in the summer of 1927.

On April 13th 1927 Professor Day began cultivating the marsh and *"it is working nicely and in good condition"* reported the Bradford Witness. It was this garden that the folks on the highway saw during the summer of '27.

THE WORK BEGINS

THE DREDGES

On May 16, 1925 the tender for The Big Scheme was let to Cummins and Robinson. On September 15, 1925, only four months later, a huge dredge had been assembled on the banks of the Holland River at Bradford and it took the first cuts out of the river bank and initiated the excavation of the canal.

During the four month period from May to September, the contractor had built a 3,000 square foot wooden scow and mounted on this scow a "Steam Driven Dipper Stick Dredge." The dredge had come to Bradford in pieces, in three railroad cars, from the American Steel Dredge Company in Fort Wayne, Indiana. Cummins and Robinson found the local people in the Bradford area to work with the foreman to build the wooden scow and mount the dredging machinery. The alignment for the canal had been surveyed and staked and a crew was clearing the first section of the right-of way along the West Gwillimbury section. Two local men, Dave Sutherland and Emerson Faris, had surveyed and placed the markers for the canal alignment. Bill Davey had worked with them to clear the survey line through the bush. They had worked during the winter of 1924 - 25 to mark out the path for canal. In a 1964 interview Dave Sutherland mentioned that he had to wear heavy mitts and a coon skin coat to protect him from the cold. His recopied field

note book, which is on file, contains the elevations of the marsh that he recorded in 1925 - 26.

Much of the information about the construction of the dredge and its progress in excavating the canal, was gleaned from reading the issues of the Newmarket Era from April of 1924 through to September of 1929. Unfortunately copies of the Bradford Witness, our local newspaper of the day, were not preserved for this period. However, in many articles that appeared in the "Era" credit is given to the "Witness."

The first article pertaining to the dredge was dated June 25, 1925 and it read as follows:

> *" One would think that the old sawmill days had returned to Bradford when he views the quantity of timber and the number of men at work at the riverside near the bridge. The contractors are busy building the scows for the great project of draining the Holland Marsh. The main scow will be 30 feet by 85 feet."*

The sawmills that were mentioned here were the two mills that used to sit on the eastern banks of the river, one to the north and one to the south of the road to Holland Landing. With these mills of course there were piles of sawn lumber and timbers, similar to the piles that were now in the work yard. The lumber for the scow came in on the train and was loaded on to horse drawn wagons and moved to the construction site on the east bank of the Holland River, just south of the bridge. The scow was assembled on the river bank on top of a skidway. When ready for launching the skidway was greased and the barge, with some urging, moved down the slight slope into the river. Once in the river the scow was manoeuvred into a channel, a slip, that had been cut in the river bank about the

same width as the scow. This allowed the workmen easy access to it when they were mounting the Dipper Stick and the rest of the dredge machinery.

Mention is also made in this article of scows in the plural. The main scow reference implied that another, maybe smaller scow was also being built. From interviews with persons who have memories of those days it has been confirmed that there were in fact three dredges, the main large dredge and two smaller ones. One of the smaller dredges were mounted on a scow which was ten feet wide and twenty-five feet long and powered by a gasoline engine. This unit worked only in the Bradford Scheme as was mentioned in the previous chapter on the Bradford Scheme. Another slightly larger dredge, twenty feet wide and forty-five feet long worked on the King Township side of the Big Scheme. This dredge was not built until 1926 and will be mentioned again later.

By July 31st the scow had been constructed and all was in readiness to mount the machinery. The completion of this stage of the work was celebrated with a Saturday night dance on August the 1st. The Witness reported the event in their August 7th issue:

> *"A very large crowd attended the dance on the new scow on Saturday Night. Mr W. G. McLellan was the floor manager, with the Schomberg Orchestra, led by Bill George, playing for them. All were having a good time when the rain came down about 11 o'clock and stopped the dance. For this dance the scow was in the Holland River and anchored to the east bank, just south of the highway 11."*

On Monday morning, August the 3rd the workmen started to mount the machinery on the scow. This scow was a hollow rectangular box, 30 feet wide, 85 feet long and 7 feet deep. It was built around a wooden frame of 8x8 and 6x6 fir timbers

and was bolted together. Three inch planks were fastened to the outside of this wooden frame, chinked and tarred to make the scow watertight. During the previous week three train cars of dredge machinery had arrived from Fort Wayne, Indiana. The workmen had been busy unloading the railroad cars and transporting the many parts and laying them out in the work yard beside the scow. Among the many pieces was a steam boiler, two steam engines, the pieces for a sixty-five foot steel boom and a two cubic yard bucket. All these bits and pieces were moved using manual labour.

The construction of the scows and the assembly of the dredges was supervised by Leonard Andrews, the construction superintendent for the American Steel Dredge Company. It was his responsibility to oversee this assembly phase and ensure that all was in good working order before turning the dredge over to the construction company and their staff. This responsibility had taken him to many locations around the world where American Steel Dredge Equipment had been used.

The following is the description of the dredge and the task that it was expected to accomplish that appeared in the Newmarket Era on August 10,1925. While it is a rather lengthy article it is in fact rather concise. The choice of words such as "staunchly, earth devouring, ladle and peregrinations" provides a glimpse of the writing style of the day. It may also send you looking for your dictionary. The second last paragraph, which mentions the crew and their living quarters, is the only written reference that was found with regard to these facilities. So here is the article, that appeared in the August 10, 1925 issue of the Era:

> *" There now lies in the stocks on the southern bank of the Holland River, beside the Barrie Highway leading to Toronto, a scow staunchly built of British Columbia fir. It is 80 feet long, 30 feet wide*

and has a depth of seven feet. Across its decks are big timbers 8x8 inches that are to carry the amphibian monster which will stick its nose down into the muck and clay, and while it builds a dyke likewise will it cut its seventeen mile circuit around the flats.

As it cuts its way it will drag itself along through the mud and slime. The dredge itself is a huge affair. The 65 foot boom of steel sticks in front drooping a dipper with a sixty-foot handle. It will take a two-cubic-yard mouthful every time it goes down and incidentally it has a downward reach of thirty feet.

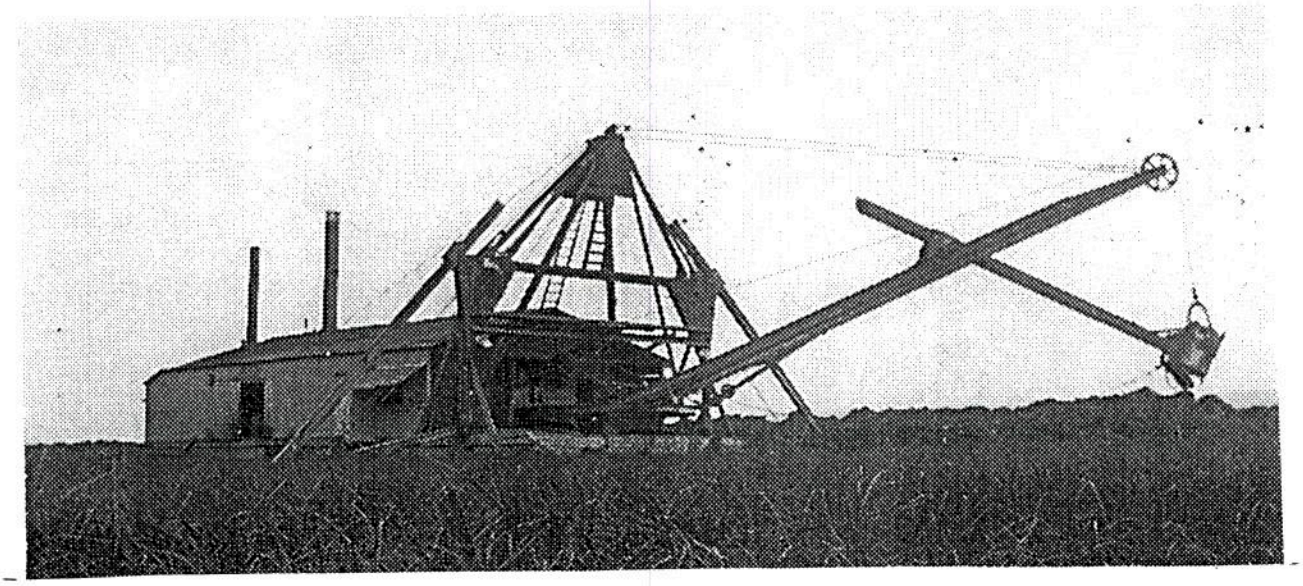
A 48 h.p. engine burning either wood or coal will power the hoist and a 32 h.p. engine will swing the boom. The progress of this earth devouring monster will depend on the type of soil it has to dig. On the top is a dressing of muck that will be literally "pie" for it, but underneath there is a bed of clay that will require plenty of steam to rip it up. The very presence of the clay will however make the building of the dyke an easy matter. It will prove a splendid dyking substance. As the machine cuts its way and tosses the dirt on its inside track to a height of 7 feet the wide outside course for the canal will be dug.

On either side of the machine will be huge bank anchors weighing about seven tons and consisting of an iron beam, which will hold the whole apparatus steady while actual dredging operations are going on. When the dipper has cleared a pathway to the end of the boom the big ladle will reach out 20 feet ahead of the boom and stick into the ground, the side anchors will be lifted, the hoisting engine will be slipped into gear and the scow and its load will be hauled ahead by

the leverage of the dipper handle. In this manner will the canal be dug and the dyke be built.

Accompanying the scow on its slow peregrinations will be two houseboats for the double crew consisting of ten men. Five men can operate the dredge but it is planned to have two shifts and run it from sunrise to sunset and probably later. There will be a fuel barge and a motor boat at the service of the big wallower. With the anchors up the scow will draw about six feet of water. The apparatus costs about $ 30,000."

Pictures of events that happened in 1925 are hard to find but when they are available they are appreciated. Three pictures, taken by Mrs. Sinclair Mills in 1926, were made available by Ron and Karon Mills of Dunkerron. The pictures show the dredge at work excavating the canal.



This picture shows the dredge at work in a grassy meadow portion of the marsh. You cannot help but be impressed by the size of this machine. The machine certainly wasn't fancy. A simple shed like structure enclosed the workings and provided shelter for the boiler, engines, winches and the crew at work. Mounted on

the front end was the heavy steel A frame, with the two spud anchors, one on each side, which each weighed seven tons. The weight of this frame, the spuds and the boom and dipper stick, all hung on the front end would suggest that this monster had to be manoeuvred very carefully. In this view the dredge is working in a grassy meadow portion of the marsh and is about to drop a bucket of material on the embankment.

> *Can't you just see the dipper stick coming up out of the "muck and slime" of the marsh, rising above the surface of the marsh, the water running out around the gate and the muck oozing over the edges of the dipper. Hearing the whoof, whoof, whoof of the steam engine as it is asked to lift the heavy load and then the second engine cutting in to move the dipper sideways to the embankment where the gate is tripped and the "muck and slime" is dropped on marsh, which will become the embankment. The steam engine is quiet again, just the click, click, click of the gears as the dipper stick swings back over the cut. It makes a loud splash as it is dropped into the water, the gate is closed and again it is drawn up through the muck in front of the dredge. As the load comes on the dipper stick again we hear the whoof, whoof, whoof of the steam engine and the cloud of steam coming from the stack with each whoof tells us that the governor have opened up and the engine is responding to the load. During the good weather season, from April to November the dredge worked twenty four hours a day along the chosen path to carve out the canal.*

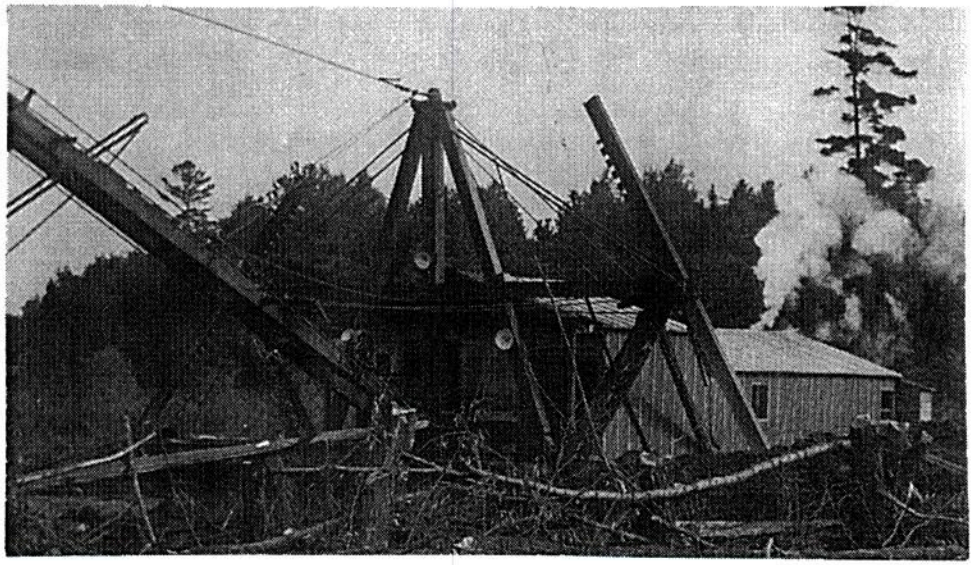
Members of families who lived in West Gwillimbury near the marsh still remember laying in bed at night listening to the huffing and puffing of the dredge as it worked its way along the edge of the Marsh.

The scow on which the dredge was mounted was thirty feet wide and eighty feet long. The long boom with the pulley at the top was 65 feet long and the "dipper stick" was 35 feet long. The large bank spuds, which project on an angle on each side, were deployed to provide lateral stability and to limit the forward/backward movement of the dredge when it is working. The dredge was moved by lifting the spuds, extending the dipper as far forward as possible, dropping it on the ground and then drawing the dredge forward by pulling the dipper back toward the dredge. The dipper could also be used to push the dredge backward, when and if needed.

This picture was taken when the dredge had first started to cut the canal. It was working in the grassy area just west of the river. The photographer is standing on the top of the embankment looking back towards the river. The rear corner of the dredge is on the right. The original of this photo was included in Professor Day's

1927 Canadian Engineer article. You can see from the picture the uneven surface of the embankment. In the background is the lattice steel framework of the old highway bridge. To the right of the bridge lay the two white houseboats that would follow along behind the dredge as it circled the marsh. A full rear view of the dredge would have shown a privy mounted on the left rear corner of the scow. All the comforts of home.

The next two pictures showing the dredge working in a wooded portion of the marsh came from the Mill's files. Both pictures show that while the trees have been cut down, all the brush, tree branches and stumps have not been removed from the working area and the line for the embankment.



The picture shows us the dredge at work and the conditions under which it operated when it was in the wooded portion of the alignment. Where there were stumps in the canal cut the operator tried to roll them out on to the opposite bank and leave them in the open. In both of these pictures stumps and debris are quite evident and it would appear they are going to be covered up and become part of the embankment. Some large stumps were dynamited. Others were removed by

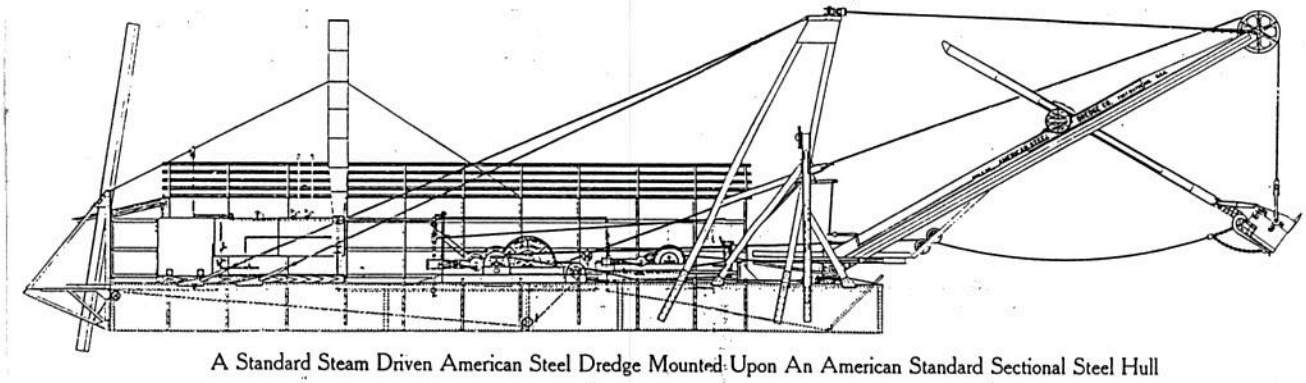
chopping around them but that was time consuming tiring manual work. Some possibly could have been pulled out using a team of horses but their use was limited to the winter months. There were no tractors or bulldozers available at that time and if they had been available it would not have been possible for them to work on the marsh because of the waterlogged conditions.

This picture also shows the dredge at work in the wooded section. The dipper stick is pointed directly at you. It would appear that the stumps in the foreground will be covered up with the muck and clay and become part of the embankment. The tree cover in the background is an example of the tree cover that had to be cleared for the right-of- way.

Over the page is an engineer's plan, of the Dipper Stick Dredge. Again, the 65 foot boom, the 35 foot long dipper stick, mounted on an 80 foot long, in this case, steel hull. The Bradford dredge you will remember was mounted on a wooden hull

of the same size. The steam boiler, placed at the rear, with a smoke stack that extended well above the roof. The mid section housed the two steam driven winches.

The rear winch, the larger one, was driven by a 48 h.p. steam engine and worked the boom, the dipper stick and the spuds. The smaller winch, the one toward the front, was powered by a 32 h.p. steam engine and worked the turntable, moving the boom from side to side.



A Standard Steam Driven American Steel Dredge Mounted Upon An American Standard Sectional Steel Hull

The boom and the dipper stick were raised and lowered with cables which fed back to the winches. The sections of the cable that were constantly running over the pulleys would become frayed and would have to be replaced regularly. It was not uncommon for a cable to snap when the operator was trying to loosen and raise a tough old stump or even when just lifting the dipper. A new cable had to be threaded through the pulleys and back to the winch before work started again. Not a bad job in the summer but pretty miserable in December when it was freezing cold and the cable was as stiff as an iron rod. And everything was covered with grease, black sticky grease that is. The boom only turned about 180 degrees as it

could not turn past the spuds. Reaching around to fix a cave in behind was not possible.

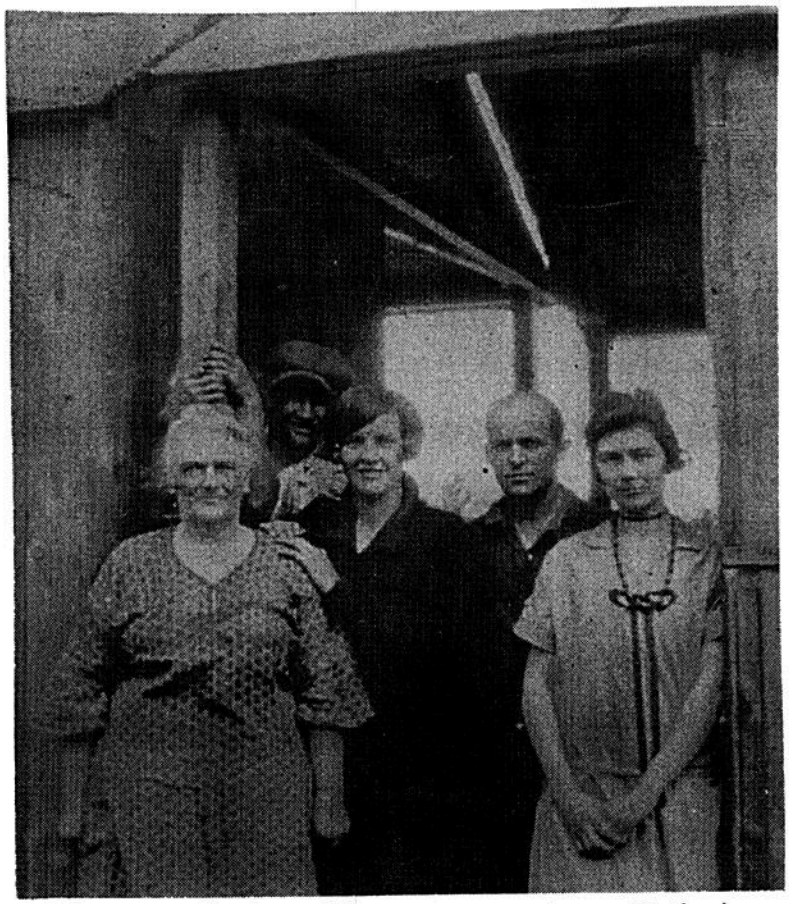
The controls for the dredge were located at the front just ahead of the small winch. There were six levers and three brake pedals that the operator used to direct the movements of the dredge. A pull on a lever would start the winch, releasing it would stop the steam flow to the winch followed up by the pressure on the brake pedal to stop and hold the winch at a certain point.

First the upward dip through the face of the cut, the turn to the side, the trip of the gate on the dipper to release the muck and clay onto the top of the embankment, the turn back to centre line of the canal, the drop of the dipper into the water and the start of the upward dip again. Dip, turn, trip, turn, dip, a cycle, maybe two cycles a minute, for hours on end. This sketch doesn't show a seat for the operator, maybe he was expected to stand.

The task of one crew member was that of oiler. He carried a large oil can with a thumb operated pump that squirted oil on the chains and winch gears and everything else that needed to be lubricated. He also tended all the grease cups that were fitted to all the bearings of the dredge. The cups ranging in size from three inches, the large ones, to smaller ones only an inch in diameter. These cups provided lubrication for the bearings and the larger the bearing the larger the grease cup. The oiler's job was to continually go around the moving machinery to make sure that every moving part had oil and grease. He would fill the cap of the grease cup, replace it on the fitting, then every so often he would turn the cap a half turn or a full turn to force the grease into the bearing. He was doing this all the time that the dredge was operating. To grease the bearings at the end of the boom and the Dipper Stick the operator would lay them out on the bank and the oiler would crawl out on the steel boom and complete his task.

The dredge required a crew of five, the dredge operator, a hand to help operate the winches, the oiler, a boiler operator who had his "papers" and a fireman to fire the boiler. There were two shifts per day working twenty-four hours a day for a good part of the year. Three local Bradford men who had their "papers" were engineers on the dredge, Dick Waller, Ed Callendar and Tom Prince. Gord (Boots) Davey was a crew member.

Two houseboats followed the dredge, one as a bunkhouse and one as a cookhouse. Mrs. Margaret Campbell, who lived on James Street in Bradford, cooked for the crew. Wouldn't that have been an experience. One person mentioned that their memory of seeing the dredge at work was the washing on the line.



Margaret "Maggie" Campbell | Gordon "Boots" Davey | Margaret Macdonald Saint (Mrs. Art) | not known | Katharine Wilma Saint

This would appear to be "Visitor's Day" on the dredge

The supplies for the cookhouse came from Bradford by various means:

> " *The men who supplied the dredge transported their goods by boat, but in the winter, Ossie McKinstry and Casey Stewart delivered the food supplies to them from Sutherland's store by horse and sleigh."*

Sutherland's was a grocery store on Holland St. West in Bradford.

The soft coal to fire the boiler for the dredge came by train to the Bradford coal yards located alongside the railroad tracks just east of where the Co-op Storage now stands. From here the Graham Brothers would truck the coal to the west bank of the river just south of the highway bridge.

At that location the coal was loaded on to a barge which was towed by a motorboat, along the canal to the dredge. Mel and Gurnel Peterman were responsible for this operation. They also brought the spare parts, the grease and oil and the other bits and pieces that the dredge crew needed. They had a twenty-one foot boat powered by a three cylinder inboard gas engine that they used to pull the barge. To protect the wooden boat from the debris that was floating in the canal they covered the outside of it with galvanized metal. Large scoop shovels were employed to both load and unload the barge.

A working steam engine of this size would use about 40 gallons of water an hour, 400 gallons every ten hours, about 1,000 gallons in a twenty four hour period. A steam engine without water is like your car when the gas tank is empty. Steam engines need clean water and while there was lots of water around the dredge it wasn't always clean. The crew found the water for the steam boiler but where it came from is another unanswered question.

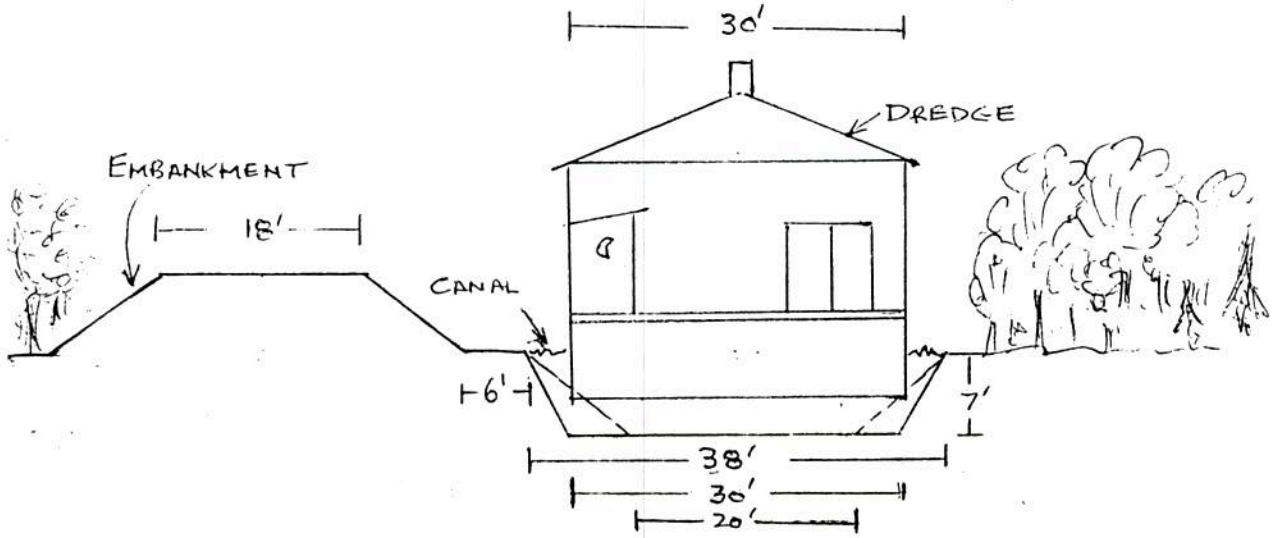
Earlier the main survey crew had marked the centre line of the canal which had been a guide for the clearing of the right of way. The dredging crew now used this line, marking the edges of the canal on either side of the centre line with 8'

stakes, cut from the brush and blazed on one side so the markers could be more easily seen by the dredge operator.

The dredge crew faced all kinds of weather. The dredge was open and exposed to the sun, rain, snow , wind, cooling breezes and freezing cold. In the winter the heat from the steam boiler was a comfort but in the summer it was like working in a steam bath. In winter the crew strung a canvas across the front of the dredge to provide some protection but still they and the machinery were exposed to the elements. It wasn't an enjoyable task replacing a steel cable on a cold winter day. This was the job and the crew accepted these conditions as part of their job. We also forget that this work was taking place in a virtual wilderness. While there were established roads on the highland none of them entered or accessed the marsh. Access to the dredge was by boat in the summer and over the frozen canal and marsh with team and sleigh in the winter.

On numerous occasions the dredge got hung up. The scow was seven feet deep and it drew almost six feet of water. A little bit of carelessness in not making sure that the canal was a full seven feet deep and there could be a problem. As well, the muck soil was not stable and the bank would slide off into the newly cut canal. If possible the dredge would push backward past the problem area and then move forward to reshape the bank. In other places the only alternative was for the crew to use shovels to clear a path for the dredge or restore the canal bank by hand.

Cross section of the thirty eight foot wide canal



In the 38' portion of the canal the 30' width of the dredge did not leave much room for error. To make it possible to move the dredge through this section, the dredge had to excavate almost the full 38' width to the full seven foot depth. The dredge operator soon found that by making the sides straight he had fewer problems. The young folk who swam in the canal in later years found there wasn't much slope on the sides.

Earlier it was mentioned that there was a third dredge. This one did not come on the scene until the summer of 1926. The July 2, 1926 issue of the Era-Witness reported:

> *"A third scow is being constructed and equipped to work on the King side of the river, and the whole job is to be finished this year."*

This dredge, like the one on the Bradford Scheme was smaller, 20 feet wide and forty-five to fifty feet long and was powered by a gasoline engine. In the late summer of 1926 this dredge started digging the south canal beginning the cut at the east end of the dam. It proceeded along the planned alignment on the King side as far as lot 12 of Concession 3, about opposite Ansnorveld, where it was frozen in for the winter. In the spring it began its slow progress along the south canal. It had to back up and go around the sandy area just west of Dufferin St. After this small detour it then proceeded on to meet the Big Dredge.

There is no written record of where the two dredges met but it reported, "on good authority" that they met near where the canal crossed Keele Street.

With the canal excavation completed the dredges returned to the work yard at the Highway bridge in Bradford. The dredges may have made some repairs to the canal and embankments on their return trip. No record as to how long that trip took. The Big dredge would be travelling in the canal dug by the smaller dredge, if it took the short route back to the work yard. Did they turn the small dredge around so they could use the dipper to move it ahead? Or did they have a boat come down the canal and take them in tow? An opportunity to let your imagination run rampant.

The two dredges were dismantled in the fall of 1927 at the same place where they were built, on the east river bank just south of the bridge. Tom Fuller and Bill Sutton worked on the dismantling of the dredges They would dive under the water and loosen the bolts holding the equipment in place. When dismantled the pieces were loaded on to the train again and shipped off to the next destination.

One of the dredges didn't travel far as reported by the Newmarket Era in their September 27th , 1927 issue:

" The dredge that was in use on the marsh has been taken to Alliston where Mr. Budd and his men are at work."

This lead was followed up but the persons contacted in the Alliston area had no recollection or records of dredging work being done in their area at that time. Another dredge from Bradford was rumoured to have been used to do dredging around Port Perry and Lake Scugog. Ernie Peterman went along as a helper on this dredge. No records there either. Their work done, the dredges left town with little fanfare but they left a lot of memories.

CLEARING AND GRUBBING

The canal was dug as close to the perimeter of the marsh as possible. This meant that most of the path for the canal and the embankment, the right of way, would be through the tamarack, cedar and scrub bush around the perimeter of the marsh. The map on page 7 shows the alignment of the canal in relation to the forested portion of the marsh.

The initial two mile section required a path one hundred and fifty eight feet wide, seventy feet for the canal, the six foot clear space on either side the canal and a clear strip on both sides for the thirty eight foot wide embankments. The next four miles required a path of one hundred and fourty eight feet. With both of the wider canals the banks on both sides had to be cleared of debris before the spoil from the canal was deposited. For the thirty eight foot wide canal an eighty two foot right-of-way was needed for the last eleven and one half miles. There was grass meadow for about a mile at the beginning, just west of the Holland River, another mile at the east and west approaches to the North Branch and a small portion of the western section. The forested area to be cleared added up to about one hundred and eighty acres. This was all manual labour, using axes and hand and

cross cut saws. Horse drawn sleighs were used to haul the harvested wood off the marsh. The slash and trim and those stumps that could be pulled were burned.

This was marsh and swamp so the winter time was the time to get the job done. The Era-Witness reported on Feb 10th 1926:

> *" The right-of-way for the drainage canal is being cleared by about thirty-five gangs numbering upwards of seventy - five men. Two or three sections of about the middle of the south side are not under way yet and they will be let free to anyone who will clear them at once. Prof Day is looking after this for the contractor."*

Bill Davey from Bradford was the person in the field supervising this operation.

One thousand dollars was budgeted to pay for the clearing of the right of way. Some of the men employed would receive pay but there were others who would work for the logs and firewood that they salvaged when clearing this path. After The Scheme was completed and the marsh land was being cleared the payment for clearing the wooded areas was often the wood that was harvested. Sometimes the deal was an acre for the owner and an acre for the cutter.

THE TIMETABLE FOR THE CANAL

This following item could have appeared in the Friday September 18, 1925 issue of the Bradford Witness:

> *"Last Tuesday, September 15th, was one that will be remembered by many Bradford folk as long folk as they live. It was still cloudy after the all day rain the day before. The wind was still from the east and it felt like a late fall day. This was to be the day that the Big Dredge*

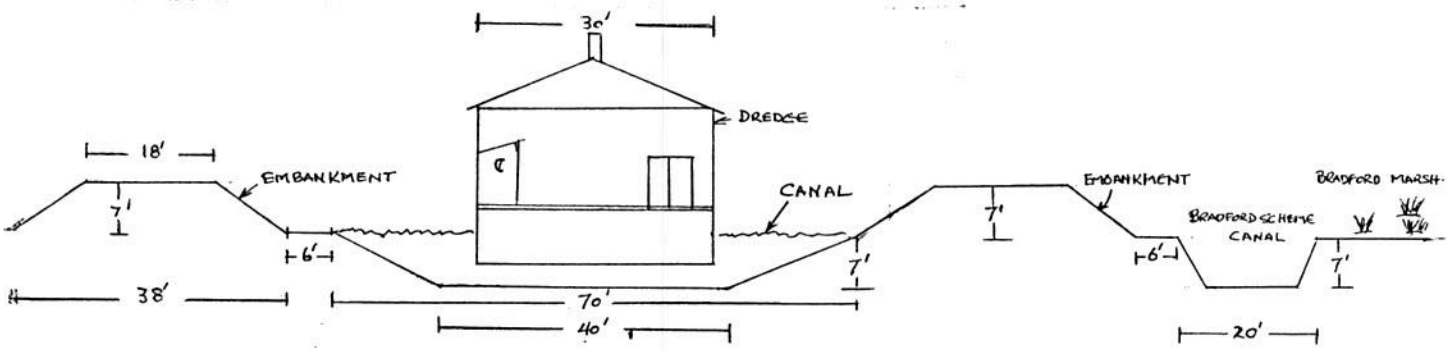
started to cut the canal and set in motion the Holland Marsh Drainage Scheme.

Interest had been mounting for the last week as to when the Big Dredge would start working. It had been stoked up daily and appeared to be ready to move from its berth along the east bank of the Holland River. The crew had been putting the dredge though its paces, lifting and lowering the dipper stick, turning right and left and taking the occasional dip from the river bottom in front of the dredge. The occasional blast from the steam whistle could be heard all the way up into town.

Members of the Councils from Bradford, West Gwillimbury and King lined Bridge Street and waited for the dredge to make its first move. Those who had worked to build the dredge and their families joined the onlookers. An excited Prof Day and the more stoic Alex Baird, the engineer, were both very evident as they stood out in the marsh, along with two helpers, at the point where the dredge was to begin making the first cut. Finally a cheer went up from the crowd as the dipper stick reached out into the river and the dredge made its first move out of the slip, where it had been built, and away from the river bank. It moved very slowly as it started towards the west bank of the river. The dipper stick was able to reach the river bottom to allow the operator to tighten the cables and slowly move the dredge toward the west bank of the river. Another lift of the dipper stick and it reached out, dug in and now was able to pull the dredge up near, but not too close to west bank. Space was needed to drop the dipper stick between the dredge and edge of the river. The large spuds were extended sideways and forced into the river bottom. The operator pulled the dipper stick back towards the dredge, dropped it

into the water, tightened the cables and brought the dipper forward and up with the first dip, a mixture of grass, muck and water. With the dipper now above the level of the marsh the boom swung over the marshy land on the left and the contents of the dipper dropped on the marsh with a mighty splash and a whump. This was the beginning of the seventeen and one half mile canal and embankment. Finally, The Big Scheme was underway."

Cross Section of the seventy foot wide canal bordering the Bradford Scheme



The first two mile section of the canal was cut through the open marsh land westward. This section was cut seventy feet wide at the top, forty feet wide at the bottom, seven feet deep. A paint mark had been placed on the dipper stick at the seven foot depth as a guide to the operator to ensure that the canal was excavated to that depth. For this first two mile section the muck was placed on both sides of the canal. This canal would run parallel with the smaller canal for the Bradford Scheme and they would share an embankment on the right hand side of the big canal. After the dredge moved past the Bradford Scheme, at the sixth concession, care was taken not to obstruct any watercourse that ran into the canal from the high land. As the dredge moved forward the two cubic yard bucket would scoop out the three or four foot deep top layer of muck and deposit it on top of the marsh to form the base of the embankment. The three feet of clay in the bottom

would then be scooped up and placed on the top and sides to form a cap and face for the thirty eight foot wide embankment. The capability of this embankment to act as a continuous dam to keep the highland water out of the marsh was improved where there was a higher clay component. The clay would bind together and seal the top and face of the embankment.

In excavating the canal the contractor found that the organic soils varied considerably as to depth and type, as did the underlying material, clay, quick sand and sand, making it difficult to construct a uniform embankment. Later mention will be made of two locations where the planned alignment was changed because of the soil conditions. While the engineer's report stated that the earth should be "uniformly deposited" the embankment was left just as the dipper stick dropped the excavated muck and clay, humps and hollows with roots and the remains of marshy plant growth sticking out of the face. It was left as a pile of dirt along the side of the canal. It would remain that way until some years later when the marsh farmers would grade a path along it to gain access to their farms. In time the clay and muck was levelled, the surface gravelled and the Canal Bank Road was made a continuous access road to provide a ready and reliable access to the marsh farms.

The excavation of the canal was a major earth moving operation. Baird in his report estimated that eight hundred and fifty nine thousand cubic yards of material would be moved in excavating the canal. This figure did not include the several thousand cubic yards of clay needed to fill the dam and the extensions. The earth that was moved to carve out the seventeen and a half mile canal by the dredge was moved two cubic yards at a time, with each dip of the dipper stick.

By early November the dredge was cutting the canal at the rate of a half mile per week. The dredge had just completed the two mile seventy foot wide section and was moving into the narrower sixty foot portion. To cover this half mile distance in a week the dredge would have had to work twenty four hours per day and complete two dips with the Dipper Stick per minute. Possible, but a work schedule that would be hard to maintain.

The dredge did shut down for part of the winter of 1925-26. This could have been because of the severity of the weather or it could have been because the right-of-way had not been cleared, or both. The weather turned very cold in mid December of 1925 down to 25 to 30 below zero. The clearing of the right-of-way was a task for the winter months and was not well organized until the winter of '25-26 when, as mentioned before, Professor Day had seventy five men working at the task.

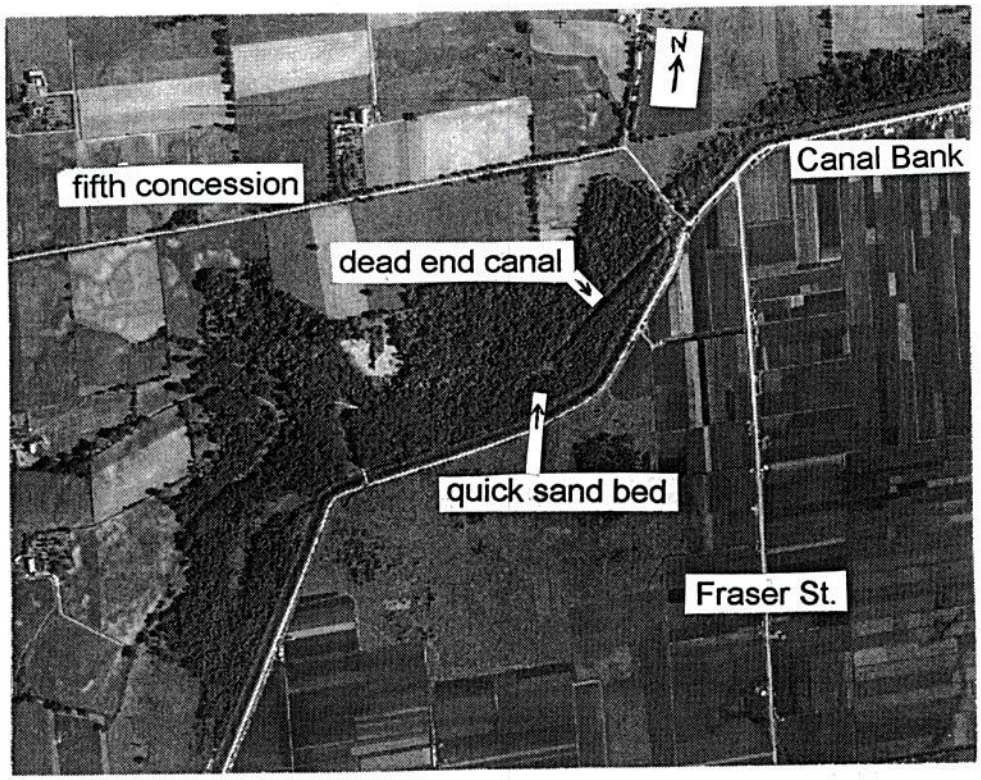
In March of 1926 the men returned to the dredge to carry out the necessary repairs and maintenance. Work didn't get underway until mid April when the Era-Witness reported:

> *" The Big Dredge on the Marsh resumed operations this week, the remaining frost being no obstacle and the work resuming day and night."*

In mid May the main dredge became stuck in a bed of quicksand. The quick sand bed was to the south and west of where the canal crossed the fifth concession of West Gwillimbury.

The dredge was in trouble in the quick sand which oozed up around it. It took some time for the crew to extract it but finally it was free. Using the Dipper Stick to push

the dredge backwards the monster was finally back to a point where the crew and the engineer agreed that the soil conditions were such that they could proceed westward along a new alignment.



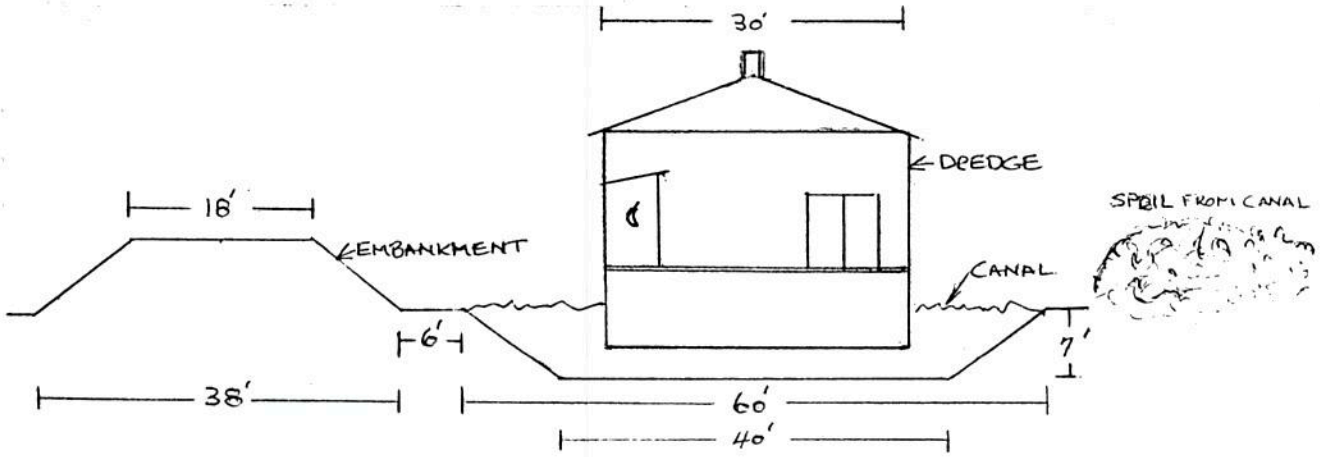
A 1946 photo of the path of the canal that ran into the quicksand

They had backed up about one thousand feet and it had taken a lot of pulling and pushing to keep the dredge in the middle of the canal. The new alignment was moved about 10 degrees to the left and the dredge began to dig a new channel.

This change required additional clearing of trees and brush along the right-of-way at a cost of $300.00. The beginning of the "dead end" cut that leads to the quick sand is still visible on the west side of the canal just to the south and west of the bridge where the 5th Concession of West Gwillimbury crosses the canal.

By July 2nd the Big Dredge was working about the McLellan farm, still in the sixty foot wide section, just east of where Highway 400 now crosses the marsh. On July 30th they were crossing the Gosnell farm the first farm east of the North Branch of the Holland River. The Big Dredge had been working for six months, from Sept 15th to Dec 15th and from April 23rd to July 30th and had almost completed the first two sections of the canal excavation. The dredge had moved over 400,000 cubic yards of muck and clay.

Cross section of the sixty foot wide canal



At this location, where the North Branch met the canal a one hundred foot long clay dam was built across the watercourse to divert the waters of the North Branch into the newly dug canal to the east to the main river. This dam was faced with a wooden sheet piling. The first step in building the piling was to drive 12" wooden piles into the subsoil on a five foot spacing at the base of the embankment. Four horizontal stringers were bolted to the piles on the inside. Three inch thick hardwood planks were then placed vertically inside the stringers, side by side, and were nailed to the them, creating a wall, or, what was called, sheet piling. Clay from the embankment was placed against this piling to create the

dam. It is not know when this structure was built. The piles for the main dam at Bradford were driven during the winter with the pile driver working on the frozen river. It could have been the same here. The dredge when passing may have built an extra heavy embankment of clay, which was readily available on the north side of the canal, and left the building of the dam until later. It was at this location where the rushing waters of the North Branch overflowed this dam, breached it and created the Hurricane Hazel Flood.

The 38' canal section, the remaining eleven and one half miles, required the excavation of about forty percent less material than in the 60' canal section. Except for about a one mile section at the beginning the canal had been dug at the edge of the marsh, close to the highland. As the dredging moved further west the alignment moved further out into the marsh. Along this path there was more muck and less clay in the canal cut and the embankment. These conditions were to be found on the north canal from half way between the North Branch to the western end, along the north-south western section and the east west southern section. It wasn't until the crew came to the higher lands near Weston Road that the half and half muck and clay mix was found again. There were also places where the canal intersected a creek. At these spots the muck was considerably deeper, there was flowing water and there was a problem in building a stable embankment that would divert the flow without eroding the canal bank.

In time, the primarily muck embankments dried and shrank, were lower than planned and in spots, prone to leaking. It was necessary to haul in clay and gravel to raise and reinforce them to ensure that they served their purpose, to hold back the water in the canal and the drainage from the highland surrounding the Marsh.

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At the south west corner of The Scheme the new canal met the Holland River (Schomberg River) flowing into the Marsh from the west. At this location a sixty foot long sheet piling dam was constructed along the face of the embankment to

divert the waters from the inflowing river along the canal. The same procedure for constructing the sheet piling at the North Branch was used at this location.

The southern canal of the Drainage Scheme was constructed along the alignment of the First Concession, the Town Line between West Gwillimbury and King. This was a designated road allowance but there was no road in this location in 1926. The 38' canal was cut adjacent to the south edge of the road allowance, with the excavated earth, the embankment, placed on the road allowance. As the marsh was developed the growers levelled the embankment and built a useful roadway on it to provide access to their farms starting westward from Weston Road. It was some time before the road was open to Schomberg.

The following is a short digression from the timetable but it will explain the alignment of the present canal beside Highway 9. In 1968 the road that had been constructed on top of the embankment was reconstructed. A new canal was dug to the south of the existing canal and two new bridges were built over the new canal, one at the western end and one at Weston Road. The old canal was drained and it was filled with clay hauled down from the high land beside 400 Highway. Much of the clay came from the south east quadrant of the #9-400 interchange. When you travel on Highway 9 today you are travelling along what was the original canal alignment. The original embankment is still in use as the service road on the north side of the highway. A field stone cairn stands in the small park on the south side of the Highway 9 to commemorate the opening of this section from Highway 27 to Highway 400 on July 20, 1970. Now back to our timetable.

Nothing more was mentioned about the progress of the dredge until January 21st of 1927 when the Era reported:

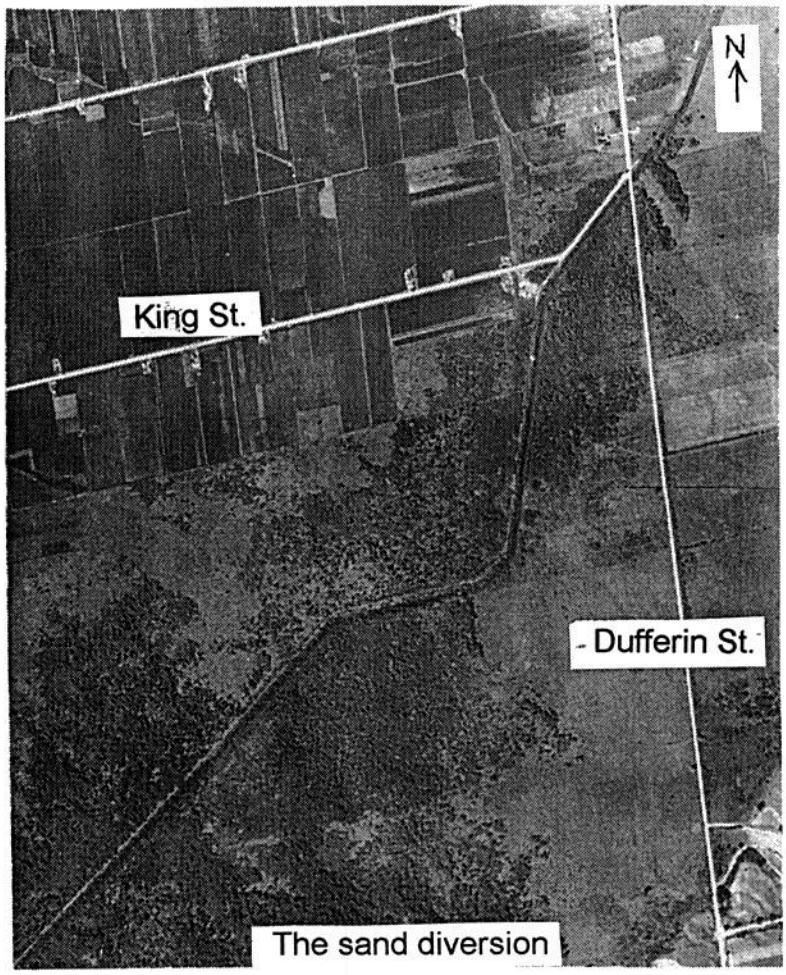
" The progress of the Big Dredge in the drainage work of the Holland Marsh has halted. The scow sprung a leak and in order to repair it a dam is being built after which the water will be pumped out and the repairing done".

The dredge somehow met up with a stump and the barge was damaged enough that it sprung a leak, filled with water and was immobilized. It was late January, the weather was freezing cold and the temperature had fallen to -20 F two nights in a row. The water in the canal was frozen and the barge was now sitting on the bottom filled with ice and water. The crew, and some welcome helpers, built a temporary dam across the canal behind the dredge to shut off the water from the canal. They then pumped out as much water as they could from around the dredge. This was a continuous operation as the swamp waters kept flowing in around the dredge. As best they could the crew cleared the mud, muck and ice from around the barge and isolated the damaged area. They first closed the hole in the hull and battening it with lumber on the inside. Then they covered the damaged area with two layers of canvas and wrapped the canvas tight against the hull with ropes. Two layers of tar were applied to make the patch watertight. The dam was removed, the barge floated and the dredge picked up where it had left off.

In February, it was reported that there was only one and a half miles of the narrow canal left to excavate and if the weather permitted the canal would be completed by the end of the month. It may be that the weather, mechanical breakdowns, crew fatigue or finances caught up with the dredging activity but this estimated completion date was not met. The Era-Witness reported on May 27th:

" The dredging is to be completed to-day and all that remains to be done will be the touching up of the canal in spots and the completion of the dam."

One of the obstacles that the smaller dredge met along the southern leg was in the area just to the west of Dufferin Street. In this location the crew found such sandy conditions that they were unable to form a stable bank for the canal.



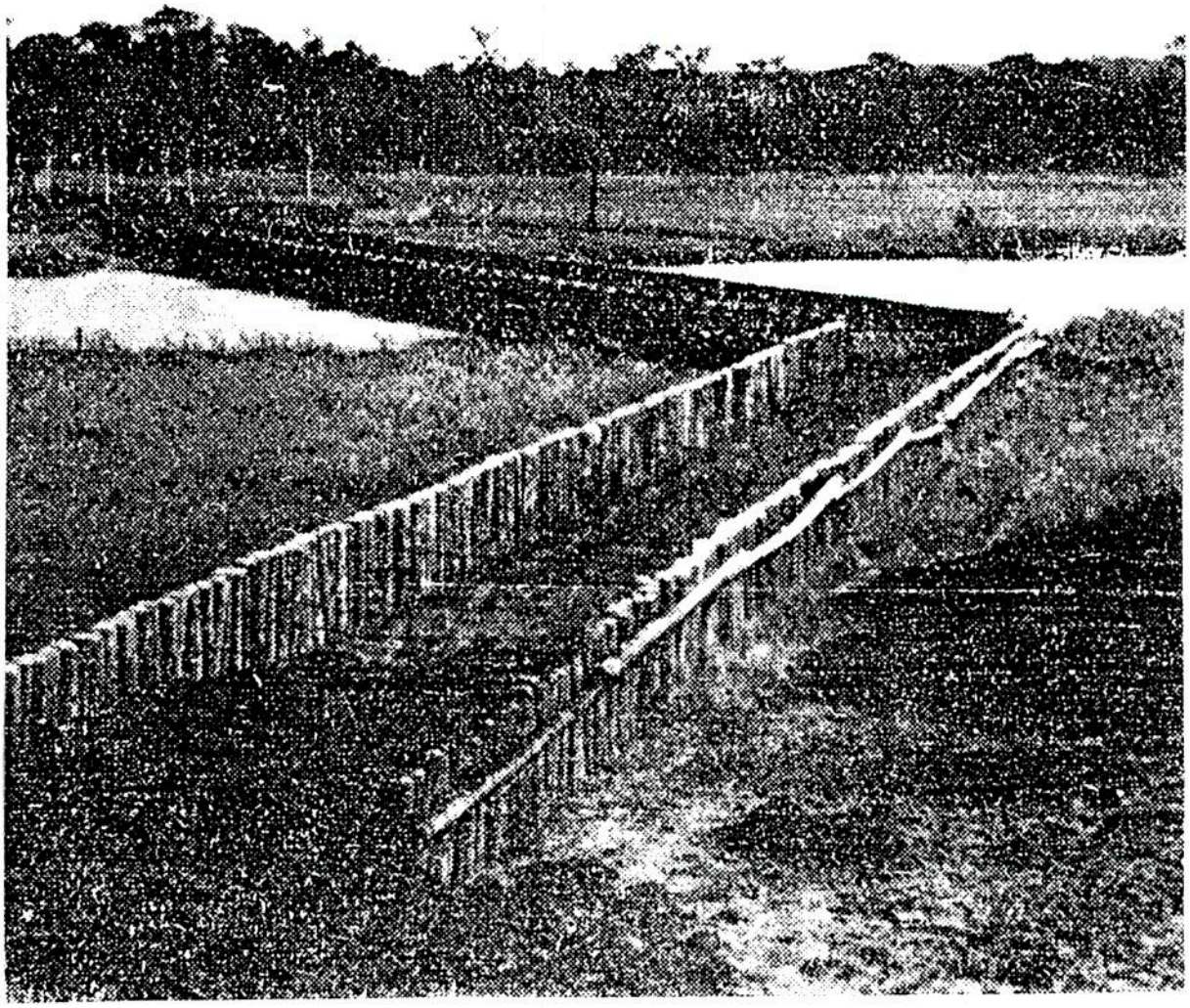
As was done at the quick sand site, the dredge backed up a distance to more stable soil conditions, moved their alignment to the left and dug a new channel around the problem area.. The dredge swung off to the south for about half a mile, almost parallel to Dufferin Street, before heading west again to meet the planned alignment on the north-east, south-west heading. You would never notice this small diversion unless you were to take a walk in the woods.

THE DAM

The second component in Professor Day's plan for the Big Scheme was to build a dam to stop the Holland River from flowing into the reclaimed area, the Marsh. While the digging of the canal required more time and inputs, the dam was more unpredictable and challenging. It would prove to be a serious problem for the contractor.

This dam was to be built at the Bradford end of The Scheme close to the highway. The original site chosen was at the junction of the north canal with the river. There had been an old saw mill on the east side of the river at this location and there were buried wood slabs and other debris that would interfere with the work. As well, soil tests and soundings showed that the muck was fifty feet deep so it would be difficult to find a firm footing for the dam at this point. The decision was made to move the site of the dam one thousand feet south where the depth of the muck was measured and it was found to be only five feet deep. This site too would provide some unanticipated problems.

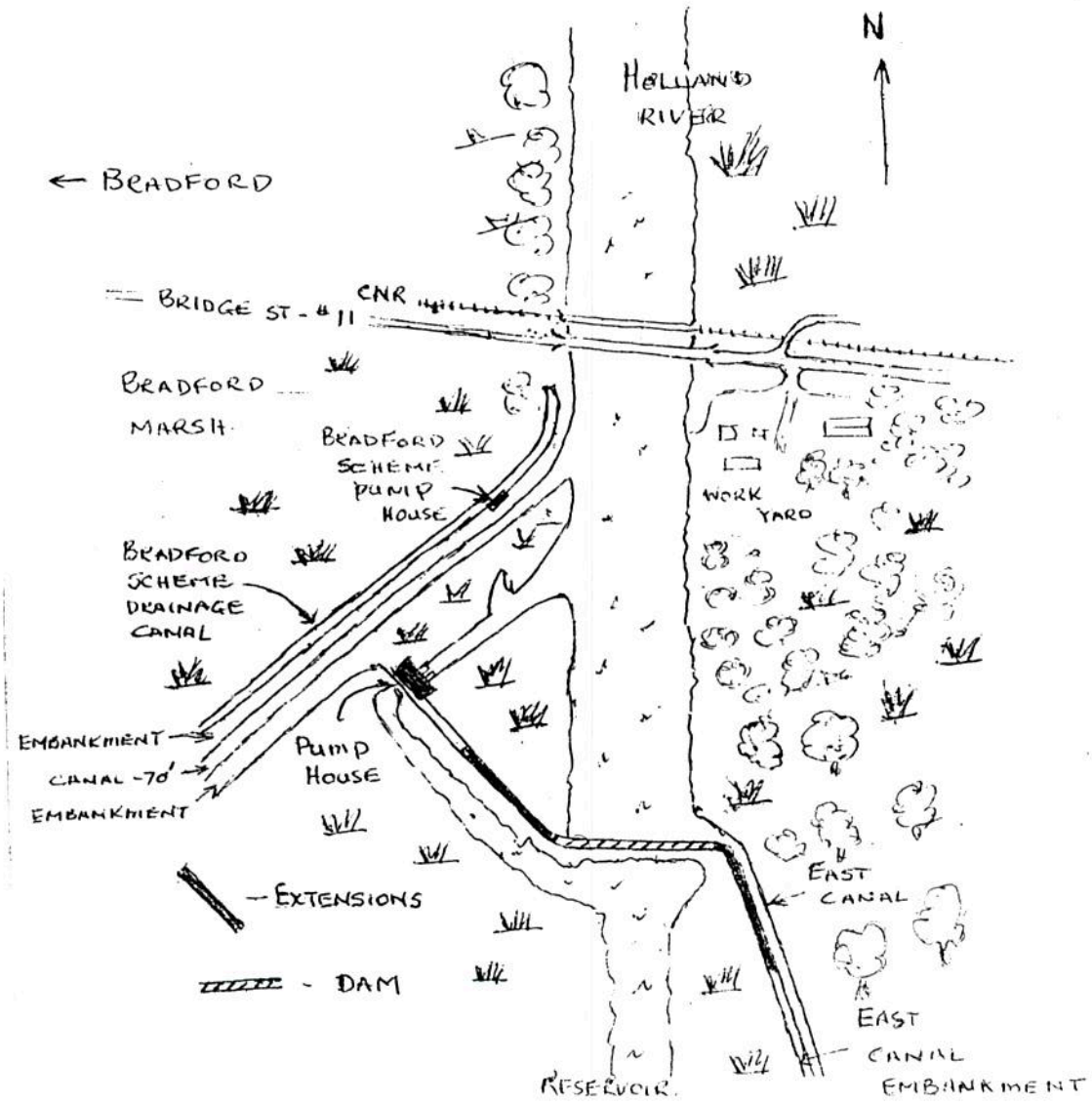
The building of the dam began the winter of 1925-26 with the driving of the wooden piles that formed the "crib" for the dam and the sides for the extensions. The deep ice on the frozen river allowed the crew to operate the pile driver and drive the one hundred piles into the river bed for the dam and the many hundred for the two side extensions on the river banks. Most of this work was completed by the end of March of 1926. The dam was 250 feet long, 20 feet wide and had side extensions, each 200 feet in length and 20 feet wide, that met up and were joined into the two embankments.



This picture of the dam, which was included in Professor Day's article in the 1927 issue of the Canadian Engineer, provides:

> *" a bird's eye view of the main dam taken from the boom of the dredge just at the commencement of the filling operations, showing the piling across the river, and also the extension at the westward end."*

The view is to the south-east from a location near where the old pump house stands.



Plan View of the Dam, The Extensions and the Pump House Location

This plan shows the dam, the extensions and the location of the pump house. You will note the channel that leads from the reservoir to the inlets for the pumps and the outlet channel that received and directed the discharge waters to the river. There was no bridge across the 70' canal, as there is now, until 1930.

Remember, the dam is two hundred and fifty feet long and the extensions are two hundred feet long, both being twenty feet wide.

Baird's in his report detailed the plan and the materials to be used in constructing the dam as follows:

> *" The dam shall be constructed in the following manner, two rows of Elm, Black Ash, or other suitable native timber, shall be driven across the river, to such width or length as is required to join properly the ends of the embankments, twenty feet apart, inside measurements, and driven five feet centre to centre, driven 10 feet, or as such depth below the river bottom as to obtain a solid firm footing and across the length required in the length of the Dam shall be three lines of three inch Elm plank, or waling, spiked to the inside of each row of the piles, one line of this plank, on each row of the piles shall be at the surface of the water of the River, another line on each row at the top of the piles, and third line intermediate between these, and close up to these lines of planking and on the inside of the same shall be closely sheet piled with three inch Elm or other suitable plank, 18 feet long, driven down until the top ends of the planks are flush with the top of the piles, and each plank of sheet piling shall be securely spiked to each line of cross planking, or waling. The sides of the Crib thus formed is to be stayed or secured together by iron rods one and one half inch in diameter, let through the sheet piling and each pile, secured with nut and washer at each end, screwed tight, to prevent the piles or sides of the Crib from spreading when the Crib is filled with earth. The Crib is then to be filled in with earth to the height of the Embankment on either sides and thus joining up the North end of the West with that of the East and forming one continuous Embankment at least 7 feet high."*

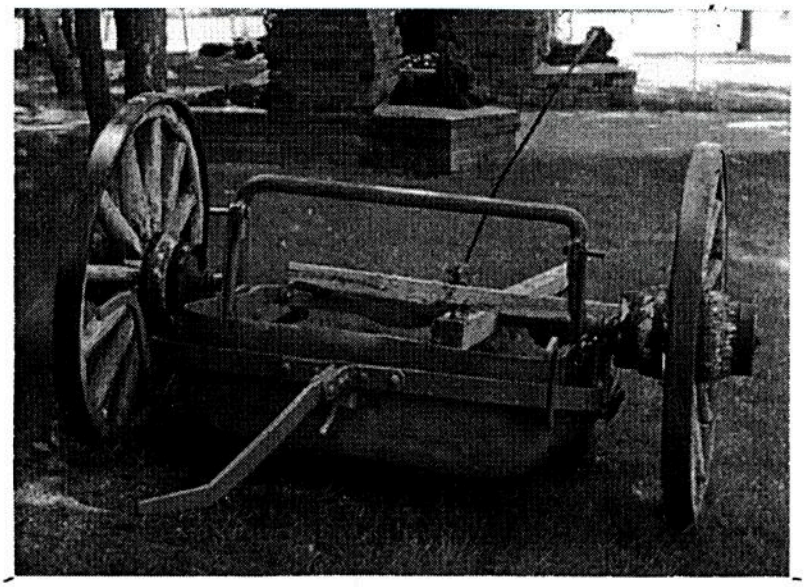
The material list for the cribbing for the dam is as follows:

- 100 piles - 12" diameter at the top, 10" at the bottom, each 18 to 20 feet long , some longer, of Elm, Black Ash or other suitable native species
- 500 running feet of 3" x 10" Elm planking for the horizontal ribs
- 600 pieces of sheet piling 3" x 10" planking, 18' long
- 50 1½ " diameter steel rods 22 feet long threaded on both ends
- 4,500 to 5,000 cu yards of clay fill

The extensions were really a part of the dam as they provided extra strength to the embankments where they joined with the dam. Four hundred feet of piles standing side by side were used to build each extension. From the picture these piles appear to be about ten inches thick at the top. They too were to be long enough to be driven into a firm footing so they were likely fifteen to eighteen feet in length.

The clay fill for the dam came from the hillside, at the foot of Drury Street, in Bradford. The parcel of land was purchased by West Gwillimbury Township on behalf of the Holland Marsh Drainage Scheme. The workings were behind 104 Simcoe Street, on the west side of Simcoe Street across from the Community Centre. This operation was managed by Gilford and Weldon (Nick) Graham and they took on the task of moving the clay from this hillside to the dam. Duke Lowe, John Maurino, John Sweezie and others hired on with their teams to work on this task.

The hillside workings were built so that the horse drawn hoosier wagons could drive under a large wooden hopper that funnelled the clay into the wagon. The hopper was filled from the top by horse drawn earth moving scrapers that scooped up the clay from the hillside and dumped their load into the hopper as they drove over the top of it. These scrapers were a well known piece of earth moving equipment of the day and were used extensively in road and railroad construction and were known many names, some complementary, some obscene.



The Earth Moving Scraper

This two wheeled horse drawn scraper had a four foot square eighteen inch deep steel bucket that held a cubic yard of earth. The one open side was sharpened and it was tipped up to cut into the ground and fill. When filled the bucket was hinged on the axle and was raised about six inches off the ground by depressing the five foot long iron bar, the Johnston Bar, that extended from the back of the bucket, and engaging a latch to hold it level. To dump the bucket the latch on the back of the bucket was released and the team of horses moved ahead. The operator had to be strong physically and patient. A steady obedient team of horses also was helpful.

The hoosier wagons were also drawn by a team of horses and they too carried about a cubic yard of clay. The "hoosier box" was mounted on a wooden wheeled

wagon gear. The box was reinforced with iron straps and had a hinged bottom that was controlled by a chain apparatus. Twelve or more hoosier wagons were used to move the clay to the dam.

They filled up at the pit then proceeded down Centre Street to Bingham, then left to Holland East and Bridge Streets to the dam. This route avoided the steepest part of the Holland Street East hill. These wagons may have had a foot brake, but most of the braking on a downslope was provided by the team of horses, their strength, condition of their harness and the conditions underfoot.

Like any other operation there were times when repairs had to be made. Bob McKinstry was the local blacksmith who had his shop where the Royal Bank is located. He shod the horses and was prepared to make all kinds of timely repairs to the wagon gear. It was always interesting to see him shape the red hot iron using only a hammer, the anvil and his tongs to hold the iron at the desired angle. His strength was often challenged by the big horses, some weighing over a ton, who came to his shop to be shod.

George Geddes had a wagon gear shop, on the east side of Barrie north of the four corners. His speciality was rebuilding wagon wheels, or making a new wheel, if needed. He would also replace a worn out iron wheel rim. He did "smithing" as well.

Secondo (Charlie) Cavallo, whose shop was the second one east of Moore, on the north side of Holland West, was the harness maker. Repairs to bridles, new bits, lines, collars, hame straps, traces and belly bands kept him busy. With the many teams of horses needed to haul all this clay there was the off chance that he might sell a full set of harness to an owner who had work for his team and some cash.

About five thousand cubic yards of clay was required to fill the twenty foot wide crib of the dam and the extensions. The space to be filled was six hundred and fifty feet long, twenty feet wide. For the land section it was seven feet deep but where it crossed the river the water was from seven or eight feet deep so the clay fill was fifteen to sixteen feet deep for the middle fifty feet of the river.

To begin filling the extensions and the dam the hoosier wagons dumped the clay near the entrance of the cribs and the scrapers moved it into the narrow channel between the crib walls. They were more manoeuvrable in tight quarters. The scrapers would go into the crib and venture as close to the water as they dared, dump their load and turn and head back to the stock pile. The shovelling crew would then take over, levelling the fill in preparation for the next load. Once the cribs were filled above the water level then the wagons could drive through and drop their load. A drag, made of logs, for weight, and with an iron edge, drawn by a team, levelled and packed the fill. In the real close quarters the machine of the day was a man on the end of a long handled round mouth shovel.

No history is complete without a story that has been passed down by word of mouth. The story goes like this. The crew had been filling the dam for some time and were making good progress. They came to work this morning and they couldn't believe their eyes. The clay fill in a section of the crib for the dam had disappeared. About seventy-five feet north of the dam in the middle of the river there was an island of clay that had not been there before. The clay had moved underground. This story is credible. The same thing happened when Highway 400 was being constructed. Where 400 crossed the Holland River the muck was so deep that it couldn't be excavated by the contractor. The decision was made to use dynamite to disperse the muck. Blasting material was laid in the muck which was then overlaid with a layer of six to eight feet of clay. The blast was discharged and the clay dropped down to replace the muck. The next morning the crew

returned to find the clay gone and a mound of clay and muck in the marsh about one hundred feet east of the spot where they were working.

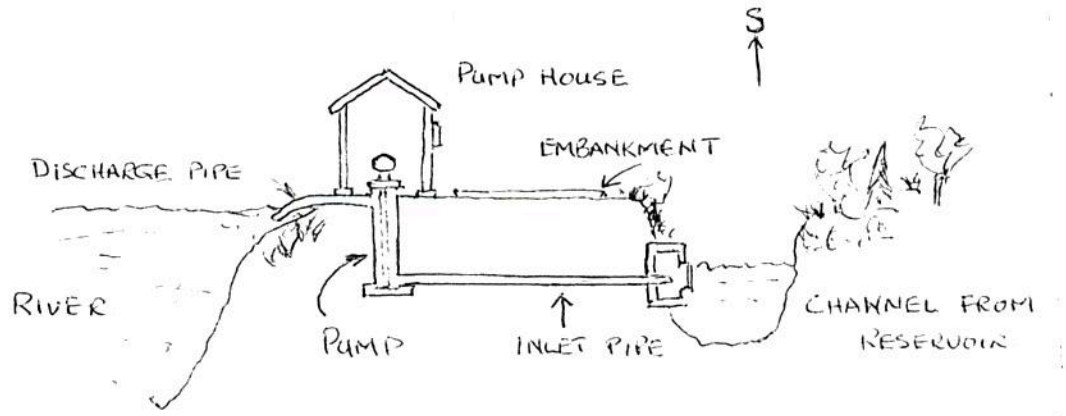
In 1929 a portion of the dam let go and the north east quadrant of the Marsh was flooded. Four acres of elm logs were cut and placed along the face of the dam to reinforce it. Later, old cars and obsolete implements, filled with clay, were incorporated into the face of the dam to strengthen it. For a number of years the Saturday morning collection of ashes and garbage was dumped on the face of the dam adding more fill to build it up. The dam now is four times the original width of twenty feet, a measure of the amount of material that has been added over the years. With this widening the travelled portion of the road has also changed. The original road had an almost ninety degree turn at the eastern end of the dam where the dam joined the eastern extension and embankment. The next time you cross the dam heading south look over to your left and you can see the path of the old road.

The dam still has many hidden secrets. Recent probing of the site cannot find any evidence of the original material used to build the dam. The wooden piles, the planking, and the material that has been added, the elm logs and the old cars all seem to have disappeared. The dam is a dynamic structure, moving ever so slightly, but moving. When you contemplate the force of the water that is against this dam it is understandable why there could be movement and changes taking place. As was mentioned at the beginning of this section, the building of the dam was the most difficult of the three components to complete and maintain.

THE PUMP HOUSE AND THE PUMPS

The third component of The Big Scheme was the installation of the pumping equipment. The construction of the dam completed the encircling of the Marsh closing off any water coming into it from the river and the highland. The section of the Holland River that was now enclosed within The Scheme acted as a reservoir to receive the drainage water from the marsh lands. The role of the pumps was to lower this reservoir four to five feet thereby lowering the water level in the marsh and providing the opportunity for these lands to dry and be cultivated. The pumping equipment and the pump house design were a major departure from the Baird plan.

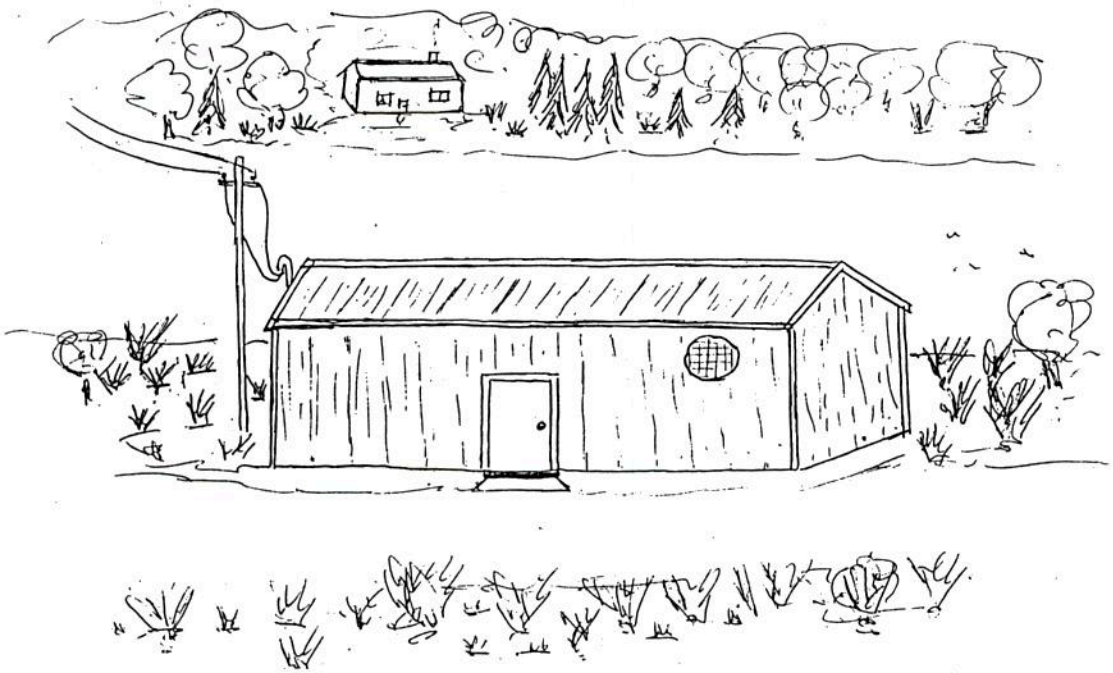
While the pump size stayed the same they were to be driven by electric motors. The pump house now only had to provide shelter for the pumps and the motors, rather than house a steam boiler.



Cross section of the pump installation

The above profile shows the arrangement for the pumps and the pump house. In this sketch the view is looking to the south, the river is on the left hand. The pump house is on the river bank on the left edge of the embankment. The inlet for the pumps runs under and through the embankment opening into the small channel on

the marsh side which was open to the reservoir. The water level in this inlet was five feet lower than the river or canal water level.



The Big Scheme Pump House 1927 - 45

The pump house was a sheet metal shed, twenty feet long and seven feet wide, which provided shelter for the two pumps that were housed inside. The shed had a two by four frame. The space between the wall studs and the ceiling rafters was filled with white asbestos insulation which was held in place by chicken wire. A twenty-four inch ventilation fan helped to lower the temperature in the shed when the pumps were running.

Steve Duga bought this shed in 1945 when it was no longer needed as a pump house and moved it to his property next door and used it to house his tractor and farm supplies for a number of years.

One of the original pu
with the pulley still att

Although the pump house is gone the two original pumps are still in their original location on the east side of the road across the road from the old Pump House. These pumps were in operation from 1927 to 1945 when new pumps were installed. The original pumps were put back into use in the fall of 1954 at the time of Hurricane Hazel. On this occasion they were fitted with pulleys and belt driven

by pulley equipped farm tractors. They were used for about six weeks to help pump the flood waters from the Marsh in October and November of 1954. These were submerged impeller type centrifugal pumps each capable of discharging 20,000 gallon per minute against a five foot head.

The two inlet pipes on the marsh side of the embankment

The water from the reservoir was fed to the pumps by way of a channel from the reservoir to the inlet pipes, then through the two twenty-four inch galvanized iron pipes to the pumps. On the north side of Pump House #2 you will find a cement foundation and if you take care going down the steep bank you can look inside and see the inlets for the two original pumps, sitting in quiet repose, behind a steel grate.

These original pumps were set to lower the level of the water in the reservoir by five feet. In 1945 when the new pumps were installed they were set lower and were capable of lowering the water level by seven feet. The new 1993 pumps are capable of lowering the water level in the reservoir to twelve feet below the river and canal level but are only run at an eight and a half foot differential. Sometime when you are crossing the dam pull over to the side and take a look at the water levels on both sides of the dam. The water level in the river on the south side is eight and a half feet lower than the water in the river, as you look toward the highway bridge. This difference in the water levels is controlled by the pumps and the sturdy dam that holds back the waters of Lake Simcoe.

The Baird report recommended that the pumps be steam powered and his report went into considerable detail about the construction of the building to house the 120 H. P. steam boiler. He had left the door open in his report for Council to make a decision to use another power source other than steam. It was decided to do that and to power the pumps with two fifty horse electric motors. The building to house the pumps and motors was considerably downsized. The two fifty horsepower electric motors were connected directly to the pumps and were automatically controlled by a float switch that started the pumps when the water rose to a certain level. It has been mentioned that this float control was later replaced by timers which set the time of operation for the pumps.

In early 1927 West Gwillimbury Council entered into an agreement with the Hydro Electric Commission of the Village of Bradford to supply the electric power for the pumps. The Commission supplied three phase, 60 cycle, 4,000 volt power to the pumps and the power was available by the 15th of May in '27. West Gwillimbury, the customer promised to pay the Commission for the power in monthly payments "in gold coin of the present weight and fineness." Whether the payments were in gold coin of not the minimum yearly bill was to be $1,000.00. An interesting side note here. Some will remember when the electric power service in much of

Southern Ontario was converted from 25 cycle to 60 cycle in the early '50's. This conversion required an exchange of all electric motors. Bradford wasn't affected because their power feed had always been 60 cycle, their source of power coming from the Eugenia Falls generating station, in the Beaver Valley.

FINISHING UP

On March 4, 1929, West Gwillimbury Council authorized the Treasurer:

> *" To pay the contractors Cummins and Robinson, the sum of $6,500, the balance of their account in full settlement of all claims and demands of every nature and kind whatsoever in connection with the Holland Marsh Drainage Scheme."*

Prior to this date the completion deadline had been extended a number of times. One extension was to June 1st 1927, then later still to September of 1928. On that date Cummins and Robinson were paid an additional $8,000.00 bringing their total up to $145,000. With this March '29 payment their responsibilities for the project came to an end.

The Township of West Gwillimbury now took over the work with the expectation that they could finish the project quickly. However the Township did not give the matter their attention and the work was not completed until the end of 1930.

There is very little information available about the completion of the project. Mention is made that the dredges did some trimming up of the canal and that there were spots where the embankment sides caved in and had to be fixed. As with any project of this scale the finishing up of the many small things that may have been overlooked, or left for later, is always a problem. This was the completion of this phase the next one, the development was about to begin.

In 1929, during this period in which the Township was not deemed to be acting too diligently, the marsh land owners formed a Marsh Land Owner's Association, headed up by Professor Day. The purpose of this Association was to speak to the municipalities with one voice about their concerns. Their request was to establish a Commission that would have the authority to manage The Scheme. The townships were reluctant to give up their control and initially proposed a Commission with some powers but not control. Day went to the Drainage Referee and asked for his opinion on full powers for a Commission under the Drainage Act. The Referee suggested that the powers could be granted. With this opinion on record, the municipalities agreed and a by-law establishing the Holland Marsh Drainage Commission was approved. The members of the first Commission in 1930 were E. J. Evans, Reeve of West Gwillimbury, E. M. Legge, Reeve of King and Denis Nolan, Reeve of Bradford. By 1940 the elected officials were replaced by marsh growers who are the members of the Holland Marsh Drainage Commission today.

Professor Day was still active. As was his way, he was busy organizing, growing crops of vegetables and publicizing the potential of the Holland Marsh. In 1930, the Prof and his sons, Bill and Harry, sold $26,000 worth of vegetables from their 37 acre marsh farm in the Bradford Scheme. His vision of the Holland Marsh was now reality.

> *" It was a warm sunny day in early July of 1938. Bill Fuller was wheel hoeing his onion patch. In the plot beside him Professor Day was doing the same only his crop was carrots. It was about 11.30, and they were both a little tired, so they decided to take a breather. They sat down on the ditch bank between their plots and, as usual, discussed the state of the crops, the problems of the Marsh and the state of the world in general. The Prof was asking Bill about the new fertilizer that he had suggested he use on his onions. They pulled a*

few onions and looked them over carefully and Bill suggested the recommendation seemed to be a good one. They spoke about the prices for produce and other things , but by now it was noon, time for lunch. They parted, wishing each other the best. That afternoon the Prof died, in his carrot patch, finishing up the wheel hoeing."

Appendix A

Listed below are the properties that were optioned by W.D. Watson, on behalf of the Holland Marsh Syndicate, in January and February of 1911 and were assigned to W.H. Day in February 1912. The options are listed as they appear in document #13333, on file in the York County Land Registry Office in Newmarket. Many of these options pertain only to part of the lot as the Syndicate was interested only in Marsh lands.

The following options are located in West Gwillimbury Township:

Owner	Con	Lot
Allen Fisher	1	3
Alex Creighton	2	4
Herb Morris	2	9,10
M. A. Brandon	2	5,6
Mrs. Rob't Fraser	2	8
Mrs. Rob't Fraser	3	8
Wm Copeland & W. Miller	3	10
Alex Sutherland	3	7
Thos R. Morris	3	11
J.W. Hurd	3	12,pt13
Mrs. M. Sutherland	3	14
W.S. Fraser	4	13
M.R. Faris, S.J. Faris et al	4	14
James Bennett	4	15,16
James Bennett	6	17,18
James Archer	5	15
Barnie E. Collings	9	20,21,22
Barnie E. Collings	10	22,23
Richard Crake	10	21
James Wood	10	20
Robert McAfee	10	21
J. S. Kneeshaw	11	21
Jos. Andrews	11	21
Mrs. Luther Roberts	12	23
J.C. Dolittle	12	22
Henry R. Nesbitt	13	22
Robert Clement	11	22
Sam Neilly	13	23

The following options are located in King Township:

James F. West	1 NS	8
Albert Wilson	1 NS	9
Thomas Webster	1 NS	pt 12
Thompson Martin	3 NS	14

Owner	Con	Lot
Mrs. M. Sutherland	3 NS	14
Mrs. M. Sutherland	1 NS	7
Luke Gibbons	1 NS	4,6
Charles Denne	1 NS	3,5
Joseph Cutting	1 NS	14
Fred A. Denne	2 NS	12
Henry Graham	2 NS	7,8,9,10,11,12,13
E. Webster	2 NS	14
Thos. R. Morris	3 NS	11,12,13
A. K. Doan	2 NS	14
B. B. Collings	2 OS	25,26,27,28
B. B. Collings	1 of E. Gwill	121
Isaac Sweezie	2 OS	22
John M. Salter	2 OS	23
Martin Dew	2 OS	21
Mrs. G. Denne	2 OS	23,24
Fred Stoddart	2 OS	11,12
William McClure	3 OS	9
Charles Denne	3 OS	6
William Graham	3 OS	10
J. H. Brillinger	3 OS	7
John McCarroll	7	35
David Dale	6	34
Alex Tatton	6	35
Zenas Black	3 OS	7
Henry Graham	2 OS	14,15
Henry Graham	3 OS	8
Thos & H. Morris	3 OS	14,15,16
J. G & Alex Shields	1 w of Yonge	119
Margaret M. Lennox	1 w of Yonge	124
Chas. B. Johnston	1 w of Yonge	120
Garabaldi Thompson	1 w of Yonge	116
John Grantham	1 w of Yonge	117
John Rogers	1 w of Yonge	119,111,112,113,114
Thos E. Foster	1 w of Yonge	122,123,124
John D. Moore	1 w of Yonge	124
James E. West	1 w of Yonge	125
John W. Huntley	1 w of Yonge	123

Owner	Con	Lot
Wm G. and Wm H. Foster	1 w of Yonge	128,129
Wright Fogg	1 w of Yonge	124,125
Albert Foster	1 w of Yonge	127
Mrs. Wm. D. Glover	1 w of Yonge	123,124
Fred A. Doan	1 w of Yonge	121

Appendix B

Property Ownership Changes on the Holland Marsh from 1911 to 1924

For the Township of West Gwillimbury

Concession	Lot	Acres in the Marsh	Owners 1911	Owners 1924
1	4	146.6	John McManus	W. Aldrich & J .O. Long
	5	141.2	John McManus	R. C. Nelles & F. J. Wood
	6	96.0	John McManus	Alex Gray
	7	5.5	John McManus	N. J. Underhill
2	4w1/2	16.8	Alex Creighton	Alex Creighton
	4e1/2	28	George Breedon	Fred Bond
	5	89	George Breedon	Mathew Brandon
	6	151.2	Mathew Brandon	D. Carroll & T. J. Overn
	7W1/2	100.8	Mathew Brandon	Alex Sutherland
	8	74.6	Robert Fraser	George Gosnell
	9	88.4	Herb Morris	Wm Day, E. E. Day & A. F. McKinnon
	10	41.4	Herb Morris	Wm Day, E. E. Day & A. F. McKinnon
	11	10.4	Herb Morris	H. Graham Estate
3	8	15.2	Mrs. Rob't Fraser	George Gosnell
	9	60.4	Macdonald Estate	Misses Macdonald
	10	102.2	Ireland & Miller	Wm, Jessie and Chas. Copeland
	11S1/2	96.4	Thos Morris	John and Catherine Day
	N1/2	80.2	Thos Morris	John Darling
	12	181.4	J. W. Hurd	J.W. and W.J Hurd
	13	126	J. W. Hurd	J.W. and W.J.Hurd
	14	65.2	Mrs. E. Sutherland	Richard and Marshall Day
	15	41.4	Mrs. E. Sutherland	Howard Henry
4	11	14.6	D. J. Sutherland	J. E.Sutherland,Ida, Daniel, Isobel Sutherland, sr & jr.
	12	146	D. J. Sutherland	J. E. Sutherland, Ida,

Concession	Lot	Acres in the Marsh	1911 Owners	1924 Owners
				Daniel, Isobel Sutherland, sr & jr.
	13	177.2	W. S. Fraser	Fred Doane
	14S1/2	104.4	no owner	R. L. McKinnon
	14N1/2	104.4	Ida Faris Estate	Robert Faris
	15	192.8	James Bennett	Walter, Hester, Hettie Day
	16	26.6	James Bennett	George and Clara Day
5	14	10.8	W. J. Faris	Vic Turner
	15	39.2	James Archer	James Archer
	16	138.2	R. Stewart	A. L. & John McKinnon, Alex Baird, J.A, M.G, A.W and Elizabeth Baird
	17	77.4	no owner	As above, McKinnon et al
6	16,17 &18	100.6	James Bennett	As above, McKinnon et al

For the Township of King (New Survey)

Concession	Lot	Acres in the Marsh	1911 Owners	1924 Owners
1	4	49.6	Luke Gibbons	Luke and John Gibbons
	5	57.6	Luke Gibbons	Chas Denne
	6	119.2	Luke Gibbons	Luke and John Gibbons
	7	208.4	Mrs. J. Sutherland	Thompson Martin
	8	185.2	James F. West	H. A. and Amy Glaspell
	9	145.2	Albert Wilson	Nathan and Polly Day, Margaret Henry, James and R.M. Bates, G and A.E. McKinnon
	10	117.6	Albert Wilson	James A. and John Woolven
	11	75.6	James Wilson	James Wilson, Emma J. Henry and George Blackburn
	12	30.8	F. Webster	Fred Walton
	13	6.4	F. Webster	Fred Walton

Concession	Lot	Acres in the Marsh	Owners 1911	Owners 1924
2	7	87.6	H. Graham	Mary C. and Christine Myers
	8	136.6	H. Graham	J.E. Howell & W.J. Squirrell
	9	110	H. Graham	J. Stewart & E. Webb
	10	152.8	H. Graham	Roy and Bertha Fleming
	11	189	H. Graham	Stewart and Laura Fleming
	12N1/2	100.9	D. Wheelihan	W. D. Wheelbalm
	12S1/2	100.9	Fred Denne	Fred Denne
	13	201.8	H. Graham	E.F. McCullough and Ruth Fleming
	14	35	A.K. Doan	W.H. Day
		25	A.K. Doan	Ayron Doan
		25	A.K. Doan	Mrs. E. Webster
		42.5	J. Black	George Blackburn
3	11	3.6	Thos Morris	Mel Underhill
	12	20.0	Thos Morris	W.H. Day
	13	70.6	Thos Morris	Howard Henry
	14	118.2	Mrs. E. Sutherland	Paul Munro and A.R. McTavish

For the Township of King (Old Survey) - east of Keele Street

Concession	Lot	Acres in the Marsh	Owners 1911	Owners 1924
3	5	2.8	Dennie	Chas. Dennie
	6	44.0	Dennie	Chas. Dennie
	7		Zenas	W.H. Day, W.A. Brodie
		108	Black	and J.H. Brillinger and
			J.H. Bellinger	Mrs Soules
	8	162	H. Graham	Florence McKinnon and Lenora McCullough
	9	190	Wm McClure	John Munro, R.L. McKinnon and Chas. Dennie
	10	172	Wm Graham	Dora E., Paul and Annie McKinnon
	11	129.2	Canada Company	Canada Company and R.S. Goodwin
	12	117.2	John Sweeezy	Freeman Porritt

Concession	Lot	Acres in the Marsh	Owners 1911	Owners 1924
	13	99.6	John Sweezy	Freeman Porritt
	14	114.0	Thos Morris	F.A. Hayter
	15	75.4	Thos Morris	Evelyn Hayter
	16	31.6	Thos Morris	Irene Drinkwater
	17	12.0	Thos Morris	Irene Drinkwater
2	9	3.6	Wm McClure	Munro, McKinnon et al
	10	29.4	Wm McClure	McKinnon et al
	11	48.8	Wm Sweezy	Hector McDonald
	12	68.2	Fred Stoddart	Hector McDonald
	13	69	John Maurino	Peter Catania
	14	34	Henry Graham	H. Graham Estate
	15	55.4	Henry Graham	H. Graham Estate
	16	22.5	L. & M. Hamilton	Janet Hamlton
		23.5	L. & M. Hamilton	J. H. Adams
	17	37	L. & M. Hamilton	J.H. Adams & Janet Hamilton
	18	22.2	L. & M. Hamilton	J.H. Adams & Janet Hamilton
	19	3	L. & M. Hamilton	J.H. Adams & Janet Hamilton

Appendix C

The following is a listing of the properties that were still associated with the Holland Marsh Syndicate in December of 1937 when The Syndicate challenged the levies against their properties before the court.

In West Gwillimbury:

Con	Lot	Acres
1	4	64.6
1	4	100
1	5	141.2
1	6	96.0
1	7	6.8
2	6	124.0
2	9	88.4
2	10	41.6
2	11	10.4
3	11	176.6
3	14	65.2
3	A	41.4
4	14	104.0
4	15	92.8
4	16	26.8
5	16	138.2
5	17	77.4
		1,395 acres

In King Township

3 OS	7	95.8
3 OS	8	162.0
3 OS	16	31.6
1 NS	8,9	320.2
2 NS	7	87.6
2 NS	8	136.6
2 NS	9	110.0
2 NS	10	152.8
2 NS	11	189.0
2 NS	13	201.8
2 NS	14	35.0
3 NS	11,12,13	94.2
3 NS	14	118.2
		1,734.8 Acres

Appendix D

Imperial to Metric Conversion Table

One inch = 2.5 centimetres

One foot = 30.48 centimetres

One yard = .9144 of a metre

One cubic yard = 27 cubic feet (3'x3'x3')

One cubic metre = 35 cubic feet (3.27'x3.27'x3.27')

One acre = .405 of a hectare

One hectare = 2.47 acres

One gallon of water weighs 10 pounds

One litre of water weighs 2.2 pounds (1kg.)

one gallon of water weighs 4.53 kilograms

Minus 20 degrees F = Minus 29 degrees C (cold eh!)

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