

ENGINEER'S REPORT
ON THE
CONSTRUCTION OF THE
FRED LENK DRAIN
FOR THE
CORPORATION OF THE TOWNSHIP OF MATILDA
1975

COUNCIL

GEORGE COOPER, REEVE

HARRY SMALL, COUNCILLOR

DWIGHT GILMER, COUNCILLOR

WILLIAM HORNER, CLERK

LORNE STRADER, COUNCILLOR

STIDWILL & ASSOCIATES LIMITED

CONSULTING ENGINEERS

CORNWALL, ONTARIO

ENGINEER'S REPORT
FRED LINK DRAIN
TOWNSHIP OF MATILDA
1975

TO THE REEVE AND MEMBERS OF COUNCIL
TOWNSHIP OF MATILDA

Gentlemen:

The following report on the construction of the Fred Link Drain is respectfully submitted under Section 3 of the Drainage Act, R.S.O. 1970, Chapter 136.

The drain has its point of commencement some 1,100 feet north of the 1/2 lot line of Lot 5, Concession 8, between the property of Mr. Fred Link and Mr. Charles Pollock. The drain runs in a general southwesterly direction to an outlet into the Toye Drain. The total length of drain is 3,138 feet affecting an area of approximately 80 acres. The section located on Mr. Fred Link's property will consist of a 300 foot shallow water course which will drain into a new catch basin to be installed between the Fred Link and Charles Pollock properties. The section on Mr. Charles Pollock's property will consist of an underground tile only with a catch basin on the west side of his lane opposite the existing culvert near Station 7+69. As for Mr. Dwayne Harper's property, for best results, it was decided to have both a shallow water course along with a tile-drainage system. The same will hold true for the Martin Bongers property.

PRESENT CONDITIONS

Our survey shows that the land has a general slope to the southwest and is badly in need of drainage.

PLAN

A plan has been prepared showing the names of the owners written on their respective properties. The boundary limits of the watershed are shown outlined in yellow and the benefit area in red. The general course and extent of the proposed work is shown by means of a solid blue line, and tiles by means of a green line. Turns and intersections with property lines have been referenced to the hub line.

PROFILE

Wooden stakes and numbered markers, called "Stations", were driven in the ground bordering the drain at hundred foot intervals. From the plotted results of levels and soundings then taken, a profile of the work has been prepared and a new grade designed. The hub line and the present ditch bottom are shown by means of the solid and broken irregular lines respectively, while the proposed new grade is indicated by the solid red regular line. The depth of earth to be removed from the ditch bottom is shown coloured yellow and hardpan in brown. The cuts from the hub line to reach the new bottom are shown in feet and decimals of a foot along the top of the profile. There are two sets of cuts, one for the shallow water course and one giving the invert elevation of the underground tile.

WORK RECOMMENDED

I recommend that the Fred Link Drain be constructed to the dimensions shown on the profile which is attached to this report and forms part thereof.

As for the shallow water course, deepening will, on the average, run from one and one half of a foot from the hub line. All ground will be spread by the contractor as part of his contract. The amount of earth excavation is estimated at 1,200 cubic yards.

FARM CROSSINGS

The necessary farm crossings will be supplied and installed by the contractor as part of his contract. Each crossing will be provided with a new corrugated steel pipe, excepting the access culvert on the Pollock property where the old pipe will be used. Specific details are given in the attached "Schedule of Farm Crossings." Included in this Schedule is the supply and installation of two catch basins.

Further construction details for the bridges and the catch basins are outlined in the accompanying "Specifications." After construction, each owner will be responsible for the maintenance of his own crossing.

ALLOWANCES FOR DAMAGE

Excavation and spreading of large volumes of subsoil from the drain over the adjoining farmlands will cause a certain amount of damage. Also, the collection of small debris from the spreading area and the necessary fence repair will cause

extra expense for the owners adjoining the course of the drain. As part compensation for these extra expenses, the usual allowances have been granted and are as shown on the accompanying "Schedule of Allowances for Damages."

FUTURE MAINTENANCE

Future maintenance of the scheme will be the responsibility of the Township of Matilda, and the cost of such maintenance will be spread over all the lands and roads affected and in the same proportion as shown in the annexed Schedule of Assessments under the heading of Maintenance Assessments.

Owners are not allowed to obstruct the shallow water course because this forms a part of the municipal drainage system.

ESTIMATE OF COST

1,200 cu. yds. Earth Excavation @ \$1.15 per cu. yd.	\$ 1,380.00
900 feet of 8 inch tile @ \$2.50 per ft.	2,250.00
900 feet of 10 inch tile @ \$2.90 per ft.	2,610.00
1,300 feet of 12 inch tile @ \$3.20 per ft.	4,160.00
Allowances for Damages	1,173.15
Allowances for Land Taken	319.40
Supply & Installation of Farm Crossings(2 catch basins)	1,200.00
Preparation & Printing of By-laws	150.00
Meeting of Council	200.00
Clerk's Fees	250.00
Engineering Fees	1,500.00
Supervision & Inspection	<u>500.00</u>
Total Estimated Cost	\$15,692.55

This Total Estimated Cost of \$15,692.55 has been apportioned in the following manner:

Outlet Liability-Real Property-Twp. of Matilda	\$ 2,895.63
Benefit-Liability-Real Property-Twp. of Matilda	12,096.27
Out let Liability-Twp. Roads-Twp. of Matilda	307.19
Benefit Liability-Twp. Roads-Twp. of Matilda	<u>393.46</u>
Total	\$15,692.55

Trusting that this report will meet with your approval,
Gentlemen,

We have the honour to be

Your obedient servant

STIDWILL & ASSOCIATES LIMITED

Per.....*F. P. Stidwill*.....
C.E., O.L.S.

Cornwall, Ontario. December 11, 1975.

SCHEDULE "A"
SCHEDULE OF ASSESSMENT

Name of Owner	Con.	Lot or Part	Acres Drained	Outlet Liability	Benefit Liability
Fred Link	8	E. $\frac{1}{2}$ 5	12	\$ 513.28	\$1061.17
Chas. Pollock	8	W. $\frac{1}{2}$ 5	24	1026.56	4473.41
Dwayne Harper	8	S.E. Pt. E. $\frac{1}{2}$ 6	22	798.44	3517.24
Martin Bongers	8	S. Pt. W. $\frac{1}{2}$ 6	14	471.80	2200.10
Martin Bongers	8	S.E. $\frac{1}{4}$ 7	3	85.55	844.35

TOWNSHIP OF MATILDA

Concession Road btwn Conc. 7 - 8			2.3	223.59	336.34
Side Road btwn Lots 6 - 7, Conc. 8			1	83.60	57.12

SCHEDULE "B"
ALLOWANCE FOR DAMAGES

Name of Owner	Con.	Lot or Part	Allowance
Fred Link	8	E. $\frac{1}{2}$ 5	\$ 99.00
Chas. Pollock	8	W. $\frac{1}{2}$ 5	307.89
Dwayne Harper	8	S.E. Pt. E. $\frac{1}{2}$ 6	325.05
Martin Bongers	8	W. Pt. W. $\frac{1}{2}$ 6	229.02
Martin Bongers	8	S.E. $\frac{1}{4}$ 7	212.19

SCHEDULE "C"
ALLOWANCE FOR LAND TAKEN

Name of Owner	Con.	Lot or Part	Allowance
Martin Bongers	8	S. Pt. W. $\frac{1}{2}$ 6	\$ 164.40
Martin Bongers	8	S.E. $\frac{1}{4}$ 7	155.00

SCHEDULE "D"

FARM CROSSINGS

Name of Owner	Con.	Lot or Part	Diam
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Dwayne Harper	8	S.E. Pt. E. $\frac{1}{2}$ 6	2 $\frac{1}{4}$ 2 $\frac{1}{4}$ 2 $\frac{1}{4}$
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1 - catch basin on fence line btwn. Mr. FRE

1 - catch basin on Mr. Chas. Pollock Prop.
near culvert)

NOTE: Under side road - 30 feet of steel
12 inches (16 gauge)

FARM CROSSINGS

SCHEDULE "D"

Name of Owner	Con.	Lot or Part	Diameter	Length	Gauge
Dwayne Harper	8	S.E. Pt. E. & 6	24"	24'	16
			24"	24'	16
			24"	24'	16

1 - catch basin on fence line btwn. Mr. Fred Link & Mr. Chas. Pollock
 1 - catch basin on Mr. Chas. Pollock Prop. (to west side of access lane near culvert)

NOTE: Under side road - 30 feet of steel pipe with a diameter of 12 inches (16 gauge)

GENERAL SPECIFICATIONS

FRED LINK DRAIN

TOWNSHIP OF MATILDA

1975

1. These specifications are drawn up to cover the work as outlined in the Engineer's Report on the drain, the said report forming part of these specifications.

Where there is any doubt as to the meaning or intention of the report and specifications as a whole, it shall be the Contractor's duty to obtain a ruling from the Engineer before proceeding with the work.

2. The work to be done shall consist of making the necessary excavation to the grade and dimensions as shown on the accompanying profile and more particularly described in these specifications, also, the cutting of any brush that may be necessary, grubbing of roots and the removal and disposal of all excavated material to points hereinafter mentioned.

Particular care must be taken that all straightening recommended is to be carried out. Portions of the drain to be straightened are indicated on the profile by those portions coloured yellow which extend up to the hub line.

3. SUPPLY OF LABOUR, MATERIAL, ETC.

The Contractor shall furnish all labour, tools, implements, machinery, material, etc. which will be necessary for the full and proper completion of the work, in accordance with these specifications, plan and profile. All work must be done to the satisfaction of the Engineer.

4. ROADS TO BE KEPT OPEN

All public and private roads shall be kept open and in a passable condition during the continuance of the work.

5. RELIEF DITCHES

In case the Contractor may make relief ditches, he must do so and refill the same at his own expense.

6. DAMAGES

In case of damage being done to any farm or other property along the line of work by blasting or other operations, the Contractor shall be held liable for such damage.

The Contractor shall also rebuild and leave in as good condition as possible all fences removed in order to execute the work. When hay or other produce is growing on lands adjacent to the proposed work, the Contractor must give the owner ten days notice in writing to remove the same before he begins work on that portion, otherwise he shall be held liable for any damage cause.

7. CLEARING AND GRUBBING

Any brush growing on the banks or in the ditch must be grubbed out clean. Small brush removed is to be piled in a neat and workmanlike manner so that it may be burned by the farmer. Large trees are not to be cut unless absolutely necessary for the execution of the work. If large trees are cut, the stumps are to be removed from the premises to a suitable dumping place away from the cultivated land, and away from the spreading area. If a suitable dumping place is not available on the property on which the drain is located, then these stumps will be removed to the township dump by the Contractor as part of his contract.

Small branches are to be cut and piled so that they may be burned by the farmers, and the trunks of large trees and branches cut into log lengths and piled clear of the drain so that they may be salvaged by the farmer. I wish to impress upon the Contractor that he is to avoid cutting large trees if at all possible. Also, the necessity of carrying out grubbing in a clean and workmanlike manner. If the Contractor wishes to bulldoze out small shrubs into piles he shall be responsible for the burning of this material. The spreading of spoil directly on small brush without previous grubbing will only be allowed in swamp and muck land at the locations mentioned later in these specifications.

8. DISPOSAL OF MATERIAL

The excavated material shall be disposed of so as to do as little damage to lands and crops as possible. It shall be taken back at least 8 feet from the edges of the finished drain so as to leave a berm of 8 feet in width of the spreading is done in cultivated land. If the earth is spread along unopened road allowances it shall be so spread that no holes remain along the roadway and so crowned that no water will lie on the roadway. In either case the outlet or course of all neighbouring ditches must be saved from damage by the spreading.

The excavated material shall be spread and levelled by means of a bulldozer, or similar equipment, so that the finished work presents a neat appearance and leaves the land so that it can be easily worked by the farmer, and spread in such a manner that the average elevation at any particular location does not exceed the elevation of the adjoining land by more than 6 inches in cultivated land, and 12 inches in the case where spreading is done in wooded areas.

Wherever they occur, stones larger than one foot in volume are to be buried by the Contractor as part of his contract. These stones are to be covered with at least 48 inches of soil.

Where straightening occurs, as shown on the plan and profile, the Contractor shall fill in the abandoned ditch throughout its entire length from shoulder to shoulder with the excavated material taken from the drain. They may, or may not, entail transportation of the excavated material by trucks or other equipment. The cost of this work is to be included in the unit price for excavated earth quoted by the Contractor in his tender price.

DESCRIPTION OF DITCH

The bottom of the ditch shall be brought to an even grade between the stations so that no water may lie stagnant therein.

Rock cuts, should they occur, shall have vertical sides and width equal to the specified bottom width for the drain at that point.

It is essential that the side slopes shall not be greater than that specified. The Contractor shall not be allowed to increase the bottom width without maintaining the specified side slopes.

Bottomwidth for the shallow water course on Mr. Fred Link's property is 3 feet. The location will be along the easterly side of the line fence. The west side of the ditch will have sideslopes of 1-1/4 to 1 and the east side will have a sideslopes of 4 to 1.

The underground tile commencing at Station 0+00 to 9+00 will consist of an 8 inch diameter pipe with one catch basin located at 0+00 (under the line fence) and another located on the west side of the culvert across the access lane at Station 7+75. This culvert will be lowered by contractor to the level of the catch basin in order to allow the easterly lane ditch to drain into the catch basin. The lane will be covered by 8 cubic yards of 3/4 inch crushed stone to be supplied by the contractor as part of his contract. Rip-rap will be placed on both sides of the access culvert.

Each catch basin will be covered with a grill made up of 5/8 inch round black iron rod welded to cross bars with a 1 inch opening.

From Station 9+00 to 18+11 the drain shall consist of a shallow water course with a bottomwidth of 3 feet and sideslopes of 3 to 1. Here the underground tile will have a diameter of 10 inches.

From Station 18+11 to the outlet the drain shall consist of a shallow watercourse with a bottomwidth of 3 feet and sideslopes of 3 to 1. Inside of this section of drain, a 12 inch underground tile will be installed.

NOTE: Where the underground tile crosses the township side road a 30 foot long, 12 inch diameter steel pipe will be used.

Included in the contract is the relocation of the existing side road culvert to line up with the new shallow water course along the north side of the northerly road fence. This includes the supply of pitrun gravel for compaction. No rip-rap is required on this side road culvert unless requested by the Road Superintendent, in which case the contractor will be paid the sum of \$180.00 extra. This sum will then be assessed against the Municipality as an Improvement Assessment against the side road.

UNDERGROUND TILE

The 8 inch and 10 inch diameter underground tiles may be clay-tile, concrete tile or slotted plastic tile of the general

approved type used for farm drainage purposes.

The 12 inch diameter tile will be clay or concrete or similar tile to be approved by the Engineer prior to installation. All material to conform to A.S.T.M. test requirements for standard drain tile.

All underground tiling will be done by a registered tile drainage contractor with the contractor on the drain having the supervision and bearing full responsibility. At any place the minimum cover over the top of the underground tile will be 30 inches.

All work on underground tiles is to be done with the utmost care and workmanlike manner to the satisfaction of the Engineer.

It is contractor's duty to notify the Engineer at least 3 days in advance of the installation of underground tiles.

BELL CANADA UNDERGROUND CABLE

The underground tile will cross the buried Bell Canada toll cable at a point near Station 13+84 on the Plan and again near Station 24+39. It is contractor's duty to notify Bell Canada at least 5 days prior to any work in the vicinity of the cable to have its location staked out by Bell Canada personnel.

Hand digging across cables is necessary. Avoiding damage to buried cables will be contractor's responsibility. In case of damage due to negligence on his part, he will be held fully responsible.

FARM CROSSINGS

Included in this contract is the supply and installation by the Contractor of a number of farm crossings as shown on the accompanying Schedule.

It is the Contractor's duty to contact each owner prior to the installation of each crossing to determine its most desirable location.

Only new galvanized corrugated steel culverts are to be used, having the correct inside diameter, length and gauge as indicated in the Schedule. The quality of the pipes is subject to the approval of the Engineer.

Each pipe will be laid on undisturbed soil and at the correct bottom grade. Construction of the crossings includes the backfill which will be shaped and compacted by the Contractor in a good and workmanlike manner, to the satisfaction of the Engineer. The minimum cover over each pipe will be 12 inches, regardless of the level of the surrounding field. The minimum width of each roadway across the pipe will be 16 feet. Ground used for backfill over culverts shall not contain old wood or other debris, nor old stumps. Backfill with soil containing a high percentage of muck or pure sterile sand must not be used.

RIP - RAP

Both ends of each culvert will be rip-rapped with stone, hand placed, starting from the bottom of the new drain, to a level of 1 foot below the average field elevation. Stones will have a minimum thickness of 8 inches, and will be laid flat on top of each other, with an inward slope of 6 inches per foot of height. All stones for rip-rap shall be supplied by the contractor.

This work is to be done in a neat and workmanlike manner to the satisfaction of the Engineer.

The Contractor is responsible for one year from the date of the final acceptance of the work, for washing out of a culvert, the falling down of rip-rap, or the washing off of cover, if due to faulty installation. This will be determined by the Engineer.

The contractor shall contact each owner along the drain to have the location of underground tile outlet marked out in the field.

10. GRADES

Grades will be given to the Contractor upon receiving written notice five days previous that the same are required.

11. COMPLETION

At the date fixed for the completion of the work there shall be a continuous ditch or watercourse of the dimensions set forth in the drawings, specifications, etc. and any material which may be accumulated or fallen into the ditch shall be removed by the Contractor except that it can be clearly shown that such accumulation was not caused by any action or want of action on the part of the Contractor or his employees.

12. CLASSIFICATION

Excavation shall be paid for under the following headings: Earth, Hardpan, and Rock.

"Earth" shall mean clay, sand, gravel, small stones or muck.

"Hardpan" shall mean such material other than rock that cannot be removed by the ordinary means but requires the use of picks, bars, or explosives in its removal.

"Rock" if encountered, shall mean strata rock, or boulders measuring 14 cubic feet or more.

A price per cubic yard shall be named on the tender for each material which shall include the removal of any brush from the ditch or banks.

12A. RECLASSIFICATION

No claim for reclassification of material will be allowed without positive evidence as to the exact location where reclassification is necessary, and in the case of boulders, the exact size (height, width and circumference measured in two directions) of each boulder encountered.

13. FARM BRIDGES

It is the Contractor's duty to clean out under the farm crossings and bridges on the drain. Where such crossings have not the width of $\frac{3}{5}$ of the summation of the top and bottom widths of the drain, the Contractor is to notify the owner to remove the same. If after four clear days notice in writing the owner does not remove his farm bridge, the Contractor is to remove the same and is to exercise reasonable caution so as

to not damage the material unduly and is to pile all the timber, etc. 15 feet clear of the edge of the ditch. Where the farm bridges have the widths as specified, the Contractor may remove the flooring for the purpose of cleaning but must replace the same in as good condition as before removal.

14. ROAD CULVERTS

The Contractor is to clean out under any existing open bottom road culverts which are of sufficient size, and is also to clean out any such pipe culvert which has been accepted by the Engineer as being of a satisfactory size and at a proper depth.

Any work other than the above which may be required at the site of the road culvert shall be charged against the road costs and shall be the responsibility of the Road Superintendent concerned. In order to make his equipment available for any excavation required by the lowering or replacing of a pipe culvert, however, the Contractor shall give the Road Superintendent concerned ten clear days notice in writing informing him when he will reach the site of any given culvert requiring work. Should the Road Superintendent prefer to carry out the work using his own equipment and personnel, the Contractor shall only be required to excavate to the grade up to and away from any such culvert.

15. RIGHT TO INCREASE OR DECREASE THE WORK

The Municipality reserves the right when it is deemed advisable by the Engineer to increase or decrease the amount of excavation or to deviate from the line or grade of the proposed work as shown by the drawings, but no variation shall be made from the price per cubic yard named in the contract, in consequence of any such change.

16. SUB-LETTING

No portion of the work is to be sub-let without the consent of the Municipal Council and the Engineer.

17. DEPOSIT TO ACCOMPANY TENDER

A cash deposit or certified cheque on a chartered bank for the sum amounting to ten percent of the tendered price must accompany each tender, such deposit will be returned to the unsuccessful bidders at once.

The cash deposit of the successful bidder may be retained until 37 days after the work has been accepted as finished.

18. DATE FOR COMPLETION

The whole work shall be completed on or before the day of 19 , including the spreading, and when the contractor considers that the work is completed he must notify the Engineer in writing that he requires a final inspection thereof.

The cost of inspecting the work done by the contractor shall be paid by the municipality. However, should it be found that the work, upon inspection by the Engineer, has not been done in accordance with these Specifications, the contractor shall then be responsible for any subsequent costs brought about by all extra work necessary for the ultimate final approval of the work, e.g., replacing hubs, re-inspecting the work, etc., and the cost of this extra work shall be deducted from the final progress payment issued to the municipality.

The contractor shall forfeit the amount of \$10.00 per day from his contract for every day's delay in completing the work after the date of completion unless he has been granted an extension of time by the Council of the municipality.

19. PAYMENTS

Cash payments will be made monthly equal to eighty-five percent of the value of the work done on the certificate of the Engineer should the amount of work done within the month amount to Three Hundred Dollars (\$300.00). The remaining fifteen percent will be retained until thirty-seven (37) days after the whole work has been accepted as finished.

20. RIGHT TO REJECT TENDERS

The Municipal Council reserves the right to reject any or all tenders.

21. WORKMEN'S COMPENSATION

The Contractor shall comply with the Regulations of The Workmen's Compensation Board of Ontario.

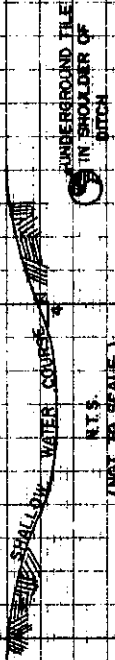
22. MEANING OF TERMS

In the foregoing Specifications, the words: "Municipal Council" shall mean the Municipal Council of the Township of Matilda.

"Reeve" shall mean the Reeve of the Township of Matilda.

"Engineer" shall mean the Engineer in charge of the work, or his authorized representative.

TYPICAL CROSS SECTION



PROFILE

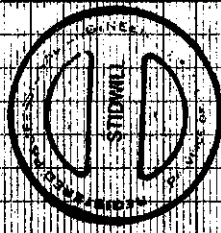
OF THE

FRED LINK DRAIN

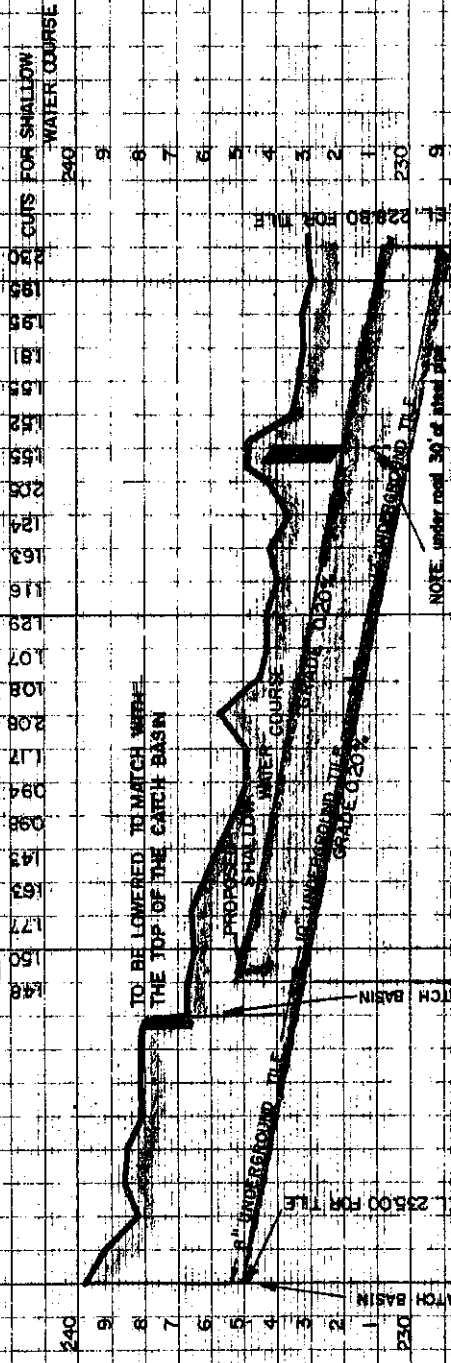
TWP. OF MATILDA

CONSTRUCTION 1975

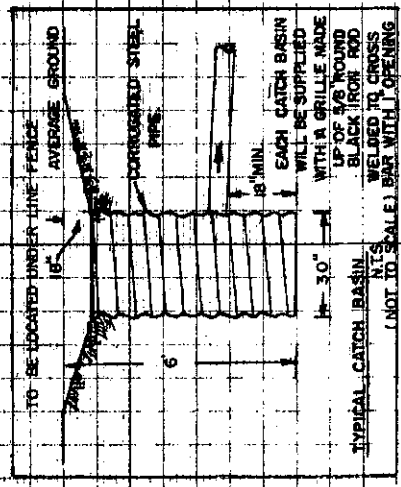
SCALE: 1" = 40' HORIZ
1" = 4' VERT



STEDWILL & ASSOCIATES LTD.
CONSULTING CIVIL ENGINEERS
CORNWALL, ONTARIO
DATE: DECEMBER 11th 1975
PER: *P. S. Stedwill*
P.S.C.
CE-0115



BOTTOM WIDTH: 3 FEET
SLOPES: 3-HORIZ TO 1-VERT



0+00 0+10 0+20 0+30 0+40 0+50 0+60 0+70 0+80 0+90

