

**DRAINAGE REPORT**  
**FOR**  
**PORTION OF THE MANNING ROAD DRAIN,**  
**MANNING ROAD DRAIN BRANCH 'A'**  
**AND**  
**MANNING ROAD DRAIN BRANCH 'B'**  
**IN THE**  
**TOWN OF LAKESHORE**

**BRUCE D. CROZIER ENGINEERING INC.**  
**CONSULTING ENGINEER**  
**1940 DEER RUN ROAD, R.R.#4**  
**LEAMINGTON, ONTARIO**  
**N8H 3V7**

**PROJECT REFERENCE BC-04-007**

September 16, 2005

Mayor and Municipal Council  
Corporation of the County of Essex  
360 Fairview Avenue West  
Essex, Ontario  
N8M 1Y6

**Mayor Croft and Councillors**

**SUBJECT: Drainage Report  
For a Part of Manning Road Drain, Manning Road Drain Branch 'A' and  
Manning Road Drain Branch 'B'  
In the Town of Lakeshore  
Our Project Reference BC-04-007**

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## **1.0 AUTHORIZATION**

Pursuant to Section 78 of the Drainage Act, the Town of Lakeshore has requested that repair and improvements be made to a Part of the Manning Road Drain, Manning Road Drain Branch 'A' and Manning Road Drain Branch 'B'. The Town of Lakeshore, acting as the initiating Municipality subsequently requested the firm of Bruce D. Crozier Engineering Inc. to make an examination and to prepare a report under the provision of "The Drainage Act 1990".

As requested by the Town of Lakeshore we have made an examination of the area requiring drainage along County Road 19 in the Town of Lakeshore. The survey of the drain has been provided to us by R. Lucente Engineering Inc., Consulting Engineer. The survey included topographical information along with measurements and cross-sections of the existing open drain, known as the Manning Road Drain, Manning Road Drain Branch 'A' and Manning Road Drain Branch 'B' all being municipal drains and I report thereon as follows.

## **2.0 PURPOSE OF REPORT**

The County of Essex is currently proposing to carry out a major road reconstruction program on the northerly portion of County Road 19. A part of that project is to widen the existing travelled portion of the road in order to add additional traffic and turning lanes.

The existing Manning Road Drain, Manning Road Drain Branch 'A' and Manning Road Drain Branch 'B' along a section of the proposed County Road 19 reconstruction project, is primarily an open drain with some road and driveway culverts. Since the travelled surface of County Road 19 is proposed to be widened it will encroach into the existing open drain.

It is therefore proposed to enclose a portion of the existing Manning Road Drain, Manning Road Drain Branch 'A' and Manning Road Drain Branch 'B' between the south side of Via Rail Canada Inc. property being Station 1+587.60 to a point approximately 230 metres south of Sylvestre Drive being Station 0+000.

This report therefore provides a description of the recommended work to be undertaken. Since the need to have this work completed is a direct result of the proposed County Road 19 reconstruction, all of the costs for the project will be assessed to and paid by the County of Essex.

## **3.0 ORDER OF PROCEDURE UNDER THE DRAINAGE ACT**

### **A) SECTION 78 DRAIN**

The following is the general order of procedure that is followed to repair and improve a municipal drainage system pursuant to Section 78 of The Drainage Act.

- a) Council determines that repair and improvements are required.
- b) Council appoints an engineer.
- c) Engineer conducts on site meeting.
- d) Engineer conducts survey of the drain.

- e) Need for preparation of a Preliminary Report is decided.
- f) Engineer completes and provides Preliminary Report.
- g) Council considers Preliminary Report at a public meeting with affected landowners and decides on option(s) with which to proceed.
- h) Engineer prepares Final Drainage Report and provides copy to the Municipality.
- i) Council considers drainage report at a public meeting with the affected landowners.
- j) At the meeting for consideration the Municipal Council may adopt the Drainage Report. If adopted the Municipal Clerk prepares a provisional by-law for the recommended work and sends copies of the by-law to affected parties and arranges a second meeting of Council for the Court of Revision.
- k) The Court of Revision is held at a subsequent meeting with the affected landowners to discuss any disputes regarding assessment of cost to lands and roads.
- l) Council passes by-law for construction of the work after statutory waiting periods and appeal periods expire.
- m) Tenders are received by the Municipality to perform the recommended work and construction is carried out. Inspection of the construction work may be provided by the Town Drainage Superintendent or by an inspector from the engineering office.
- n) Upon completion of construction the Municipal Clerk will finalize all applicable costs and submit grant applications to the Ministry of Agriculture, Food and Rural Affairs, if applicable. The clerk will then send a final net assessment to the affected landowners.

#### **4.0 CURRENT DRAINAGE REPORT**

The latest drainage report on file for the Manning Road Drain is one prepared by N.J. Peralta Engineering Ltd. dated March 5<sup>th</sup>, 2002. The latest drainage report on file for the Manning Road Drain Branch 'A' is one prepared by N.J. Peralta Engineering Ltd. dated August 27<sup>th</sup>, 2001.

#### **5.0 SITE MEETING**

A meeting was held at the office of R. Lucente Engineering Inc. on February 17<sup>th</sup>, 2004, at the meeting was Mr. Rocco Lucente, P. Eng., Prime Consultant for the County Road 19 Reconstruction Project, Mr. John Pawlowski from R. Lucente Engineering Inc. and Bruce D. Crozier, P. Eng., from Bruce D. Crozier Engineering Inc.

The proposed reconstruction of County Road 19 between the Via Rail Canada Inc. property at Station 1+587.60 to Station 0+000 was discussed. To determine what affect this reconstruction would have on the open Manning Road Drains. It was determined that the proposed widening of the travelled surface of Manning Road would position the proposed east concrete curb and gutter over the existing drain.

It was therefore decided that the existing open Manning Road Drain would have to be enclosed between the south side of Via Rail Canada Inc. property from Station 1+587.60 to the end of the proposed road reconstruction at Station 0+000.

The type of enclosure was also discussed. It was determined that since the enclosure would be located under the new travelled roadway, concrete pipe should be used to enclose the open drain.

#### **6.0 SURVEY**

Since a topographical survey of the site had already been completed by R. Lucente Engineering Inc. for the design of the road reconstruction. We were provided with base plans showing the topographical information along the length of the proposed drain enclosure.

The topographical information was used to prepare drawings for the drain enclosure from Station 0+000, which is located approximately 230 metres south of Sylvestre Drive. The survey continued northerly along the Manning Road Drain, Manning Road Drain Branch 'A' and Manning Road Drain Branch 'B' to Station 1+587.60, which will be the end of the work to be carried out under this report.

## 7.0 EXISTING SITE CONDITIONS

As a result of the topographical survey of the Manning Road Drain, Manning Road Drain Branch 'A' and Manning Road Drain Branch 'B' we have found the following:

### MANNING ROAD DRAIN BRANCH 'B'

- a) Existing open drain between Station 1+230 to Station 1+529 has evidence of minor sediment build-up and will be located under the proposed road widening.
- b) Existing 800 mm diameter C.S.P. access culvert between Station 1+447 to Station 1+456 has considerable backfall and is impeding flow in the open drain.
- c) Existing 800 mm diameter C.S.P. access culvert between Station 1+477 to Station 1+489 is too high and impedes the flow in the open drain.
- d) Existing open drain between Station 1+544 to Station 1+587.60 has evidence of minor sediment build-up and will be located under the proposed road widening.
- e) Existing pipe crossing under County Road 19 at Station 1+529 is a corrugated steel pipe which is showing evidence of minor deterioration.

### MANNING ROAD DRAIN BRANCH 'A'

- f) At Station 1+222.50 the existing 250 mm diameter P.V.C. pipe that crosses County Road 19 appears to be an undersized pipe.
- g) The existing open drain between Station 1+075 to Station 1+155 has evidence of minor sediment build-up and will be located under the proposed road widening.

### MANNING ROAD DRAIN

- h) At Station 0+957 the existing 1050 mm diameter pipe across County Road 19 is a corrugated steel pipe that has some signs of deterioration and would be changed.
- i) The existing open drain between Station 0+000 and Station 0+658 has some evidence of minor sediment build-up along with existing access culverts and headwalls that show signs of deterioration. The open drain would be located under the proposed road widening.
- j) The existing 1050 mm diameter pipe between Station 0+658 to Station 0+957 is corrugated steel pipe which would be changed under the proposed road widening.

## 8.0 RECOMMENDATIONS

As stated previously in this report, the purpose of the report is to enclose a portion of the Manning Road Drain, Manning Road Drain Branch 'A' and Manning Road Drain Branch 'B' to provide for the reconstruction of County Road 19. We would therefore recommend that the following work be performed on the Manning Road Drain, Manning Road Drain Branch 'A' and Manning Road Drain Branch 'B'.

### MANNING ROAD DRAIN BRANCH 'B'

- 1) We would recommend that the existing open drain between Station 1+529 to Station 1+587.60 be enclosed with 750 mm diameter C.S.P. and concrete pipe.
- 2) We would recommend that the existing 900 mm diameter corrugated steel pipe that crosses County Road 19 at Station 1+529 be removed and replaced with 900 mm diameter concrete pipe.

- 3) We would recommend that a 2400 mm diameter precast concrete manhole be installed at Station 1+529 as a junction chamber for 750 mm diameter pipe from the north, 900 mm diameter pipe from the south and 900 mm diameter pipe from the west.
- 4) We would further recommend that the existing open drain between Station 1+230 to Station 1+529 be enclosed with 750 mm diameter concrete pipe and 900 mm diameter concrete pipe as shown on the drawings.
- 5) We would recommend that there be precast concrete manholes, precast catch water basins, and catch water basin connections be installed as shown on the drawings.
- 6) We would recommend that the restoration of the boulevard over the existing open drain that has not been filled as a result of the drain installation be restored as part of the road construction project.

#### MANNING ROAD DRAIN BRANCH 'A'

- 7) We would recommend that the existing 250 mm diameter pipe under County Road 19 at Station 1+222.50, be removed and replaced with a new 450 mm diameter concrete pipe.
- 8) We would recommend that the existing 375 mm diameter P.V.C. pipe between Station 1+155 to Station 1+222.50 be cleaned and video inspected to confirm the condition of the pipe. If deficiencies are discovered, appropriate repairs should be made.
- 9) We would recommend that a new 375 mm diameter P.V.C. pipe be installed between Station 1+073.50 to Station 1+155.
- 10) We would recommend that new precast concrete manholes be installed, and existing ditch inlet catch water basin be relocated as shown on the drawings.
- 11) We would recommend that the restoration of the boulevard over the existing open drain that has not been filled as a result of the drain installation be restored as part of the road construction project.

#### MANNING ROAD DRAIN

- 12) We would recommend that the existing 1050 mm diameter C.S.P. under County Road 19 at Station 0+957 be removed and replaced with a new 1050 mm diameter concrete pipe.
- 13) The existing 1050 mm diameter corrugated steel pipe along the east side of County Road 19 between Station 0+658 and Station 0+957 should be removed and replaced with 1050 mm diameter concrete pipe, C.S.A. A257.2 R.G. Class IV.
- 14) We would recommend that standard precast catch water basins be installed along the road boulevard to provide for surface water drainage from the abutting properties.
- 15) We would recommend that the restoration of the boulevard over the existing open drain that has not been filled as a result of the drain installation be restored as part of the road construction project.
- 16) We would recommend that new 1050 mm diameter concrete pipe C.S.A. A257.2 R.G. Class IV be installed between Station 0+010 to Station 0+658 to enclose the existing open drain.
- 17) We would recommend that 1800 mm diameter precast concrete manholes and standard precast concrete catch water basins be located along the length of the drain enclosure as shown on the drawings.
- 18) We would recommend that a concrete headwall with safety grate be constructed at the end of the enclosure pipe at Station 0+010.
- 19) We would recommend that a gabion stone in wire baskets be constructed between Station 0+000 and Station 0+010, which will provide a spillway and bank slope erosion protection.

The construction of these alterations is recommended to be carried out under this report, however, the lateral piping is not recommended to become a part of the Manning Road Drain, Manning Road Drain Branch 'A' and Manning Road Drain Branch 'B' under the provisions of "The Drainage Act 1990".

We would therefore recommend that the work necessary to enclose this portion of the Manning Road Drain, Manning Road Drain Branch 'A', and Manning Road Drain Branch 'B' be carried out under the provisions of "The Drainage Act 1990".

We would further recommend that any future maintenance costs for the lateral piping, off set catch water basins and appurtenances that are proposed to be connected to the new enclosure pipe is the complete responsibility of the road authority or private property owners which are being serviced by said lateral piping and not a part of the Manning Road Drain, Manning Road Drain Branch 'A' and Manning Road Drain Branch 'B'.

## **9.0 DRAWINGS**

Attached to this report is Drawing No. BC-04-007, Sheets 1 to 10 which consists of a plans showing the location of the proposed work, together with the profile and details of the recommended work.

## **10.0 PROPOSED WORK**

In general the proposed work would involve the enclosing of the existing open drain between Station 1+230 and Station 1+587.60 of the Manning Road Drain Branch 'B' and between Station 1+073.5 and Station 1+155 of the Manning Road Drain Branch 'A'. Also the enclosing of the existing open drain between Station 0+010 to Station 0+957 of the Manning Road Drain. The work will also include the removal of existing driveway access culverts and replace them with the new enclosure pipe. The work also includes the installation of manholes, catch water basins and catch water basin connections along the length of the drain enclosure.

The work will also include a concrete headwall with safety grate at Station 0+010 and a gabion stone in wire basket spillway and bank slope erosion protection between Station 0+000 and Station 0+010.

## **11.0 ASSESSMENT**

We would recommend that the total cost of this work be assessed to the County of Essex as part of the County Road 19 reconstruction project.

## **12.0 MAINTENANCE**

We would further recommend that this drainage work be kept up and maintained at the expense of the lands and roads with the exception of the lateral pipes, catch water basins and offset manhole which shall be assessed totally to the properties or roads being serviced by these appurtenances.

## **13.0 DEFINITION OF DRAIN COMPONENTS**

For the purpose of defining the actual components of the Municipal Drain, the Manning Road Drain shall consist of the drain from Station 0+000 to Station 0+957.0 including all piping, manholes, catch water basins, gabion stone in wire basket, erosion protection, concrete headwalls and all appurtenances.

The Manning Road Drain Branch 'A' shall consist of the drain from Station 1+073.5 to Station 1+222.50 including all piping, manholes, catch water basins and catch water basin connections, gabion stone erosion protection and all appurtenances.

The Manning Road Drain Branch 'B' shall consist of the drain from Station 1+230 to Station 1+587.60, including all piping, manholes, catch water basins and catch water basin connections, gabion stone erosion protection and all appurtenances.

#### **14.0 FUTURE MAINTENANCE ISSUES**

Working Area - Working areas to be designated for future maintenance purposes and the municipality should keep the working area clear of obstructions.

#### **15.0 FEDERAL FISHERIES ACT**

The Essex Region Conservation Authority will review the recommended works of this report and will provide notice of project if required due to any fish habitat concerns.

#### **16.0 LATERAL DRAINS**

The cost of maintaining private service connections, private tile outlets, catch water basins and catch water basins into the Drain is the responsibility of the landowner for which said works are servicing.

All of which is respectfully submitted.

**BRUCE D. CROZIER ENGINEERING INC.  
CONSULTING ENGINEER  
1940 DEER RUN ROAD, R.R. #4  
LEAMINGTON, ONTARIO  
N8H 3V7**

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Bruce D. Crozier, P. Eng.



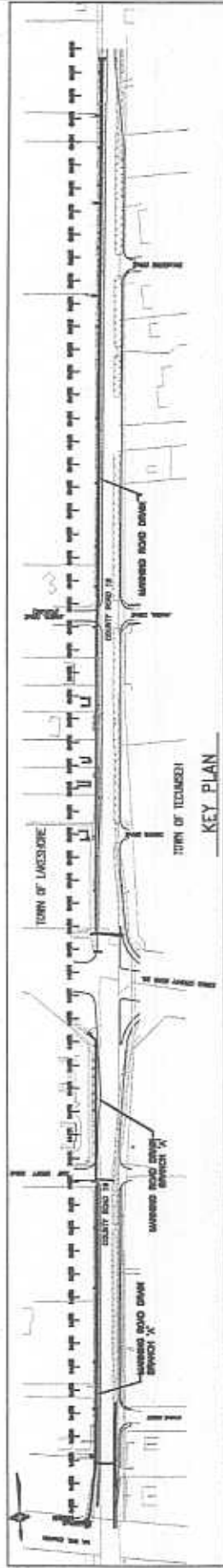
# MANNING ROAD DRAIN & MANNING ROAD DRAIN BRANCH 'A' & 'B'

## IN THE TOWN OF LAKESHORE

## IN THE COUNTY OF ESSEX ONTARIO

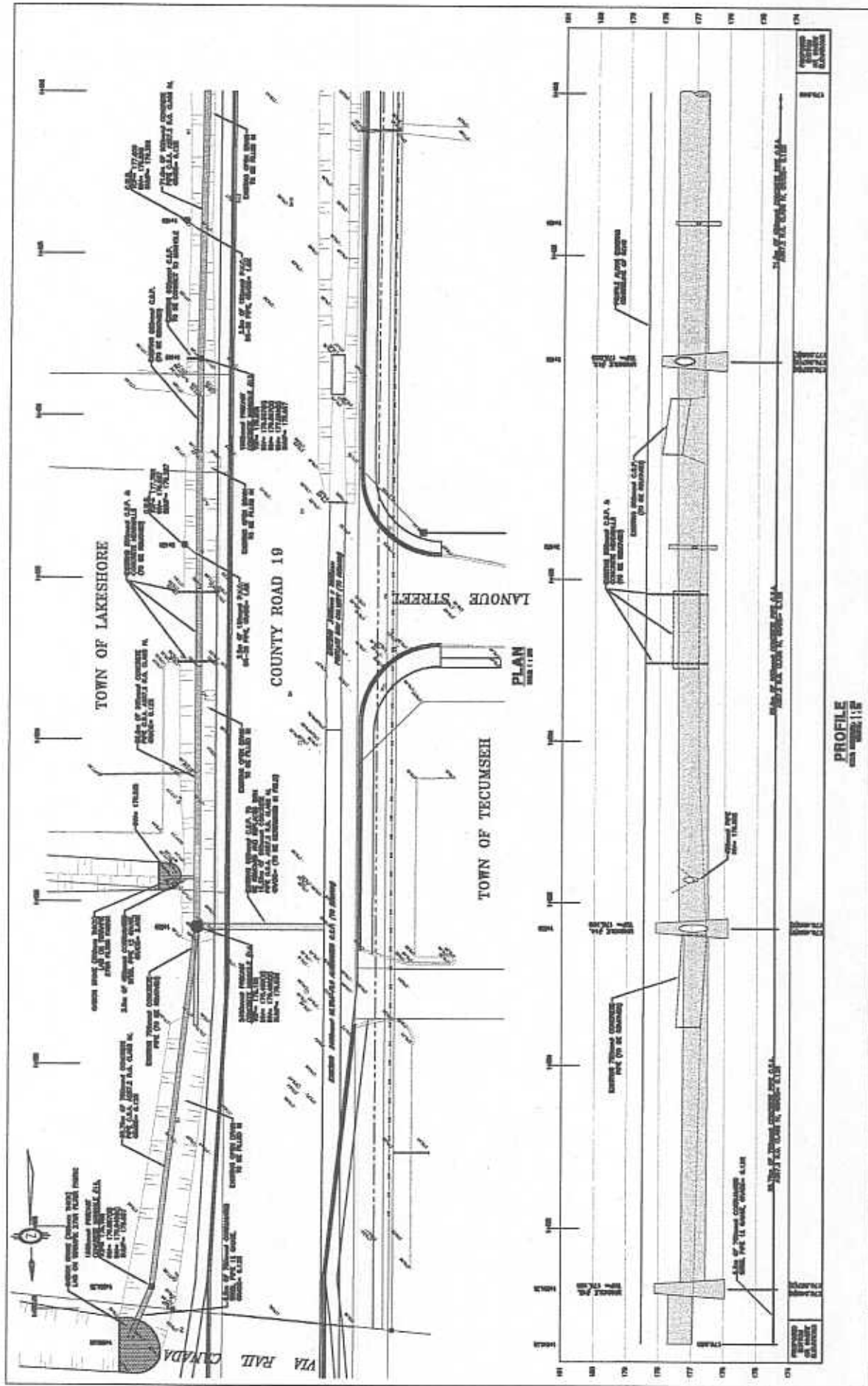
**LIST OF DRAWINGS**

- 1- TITLE PAGE
- 2- PLAN & PROFILE STA. 1+400 TO STA. 1+587.66
- 3- PLAN & PROFILE STA. 1+400 TO STA. 1+400
- 4- PLAN & PROFILE STA. 1+400 TO STA. 1+400
- 5- PLAN & PROFILE STA. 0+175 TO STA. 1+400
- 6- PLAN & PROFILE STA. 0+700 TO STA. 0+875
- 7- PLAN & PROFILE STA. 0+825 TO STA. 0+700
- 8- PLAN & PROFILE STA. 0+350 TO STA. 0+525
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- 10- PLAN & PROFILE STA. 0+000 TO STA. 0+175

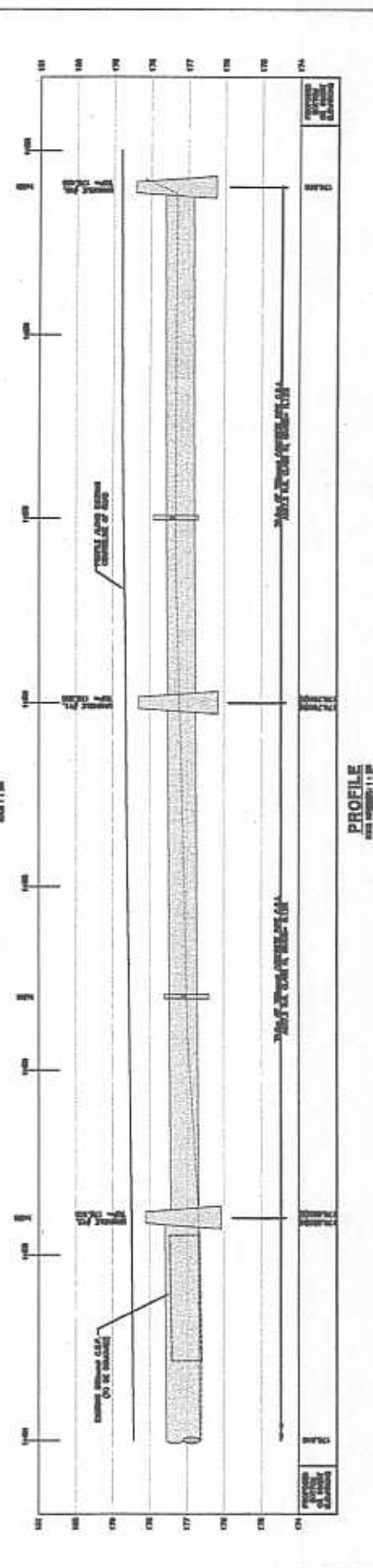
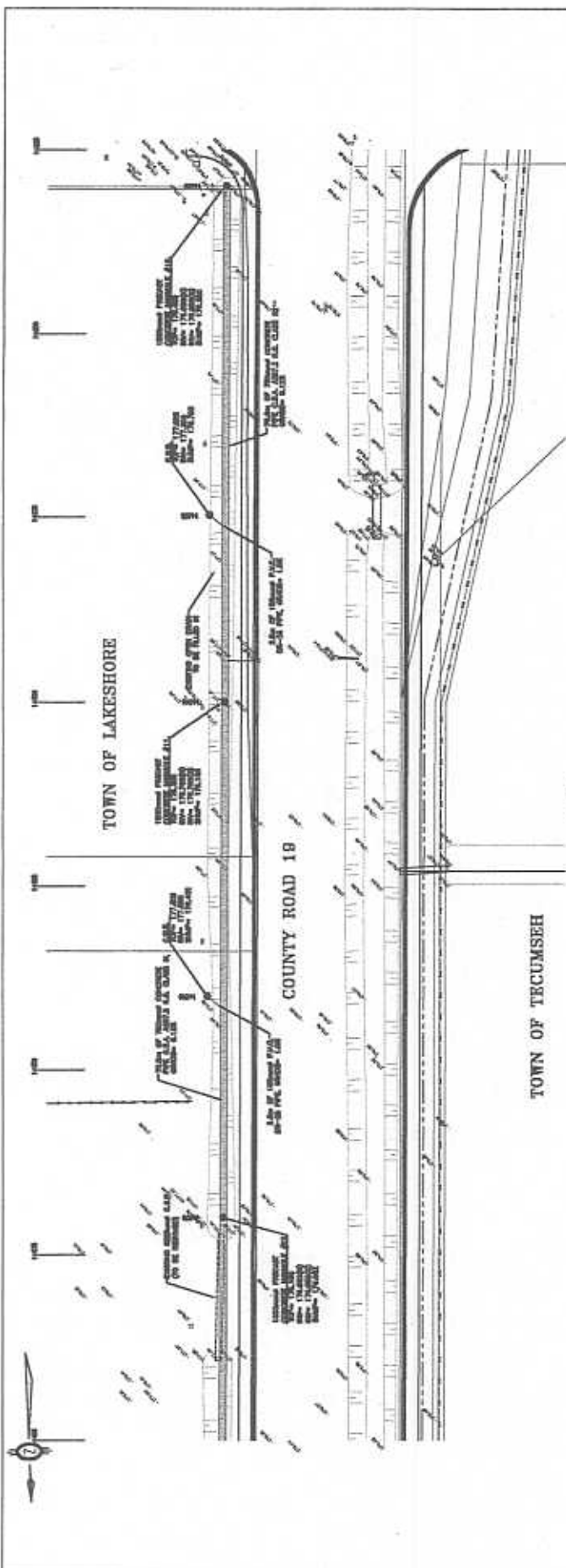


<b>R. LUCENTE ENGINEERING INC.</b> CONSULTING ENGINEERS <small>211 Lake Road, Unit #1          Lakeshore, Ontario, Canada          Phone: (519) 886-0888          Fax: (519) 886-0888          e-mail: rlucente@rlucente.com</small>	<b>BRUCE D. CROZIER</b> ENGINEERING INC. <small>CONSULTING ENGINEERS          1000 Lakeshore Blvd. East          Unit 100          Lakeshore, Ontario, Canada          Phone: (519) 886-0888          Fax: (519) 886-0888          e-mail: bcrozier@bcrozier.com</small>	<b>BC-04-007</b> DRAWING NO. <b>BC-1</b> SHEET NO.	<b>SEPT 18/05</b> DATE <b>AS NOTED</b> SCALE <b>A.P.</b> R.O.C.
<b>MANNING ROAD DRAIN, &amp; MANNING ROAD DRAIN BRANCH 'A' &amp; 'B'</b> TOWN OF LAKESHORE		<b>TITLE PAGE</b>	
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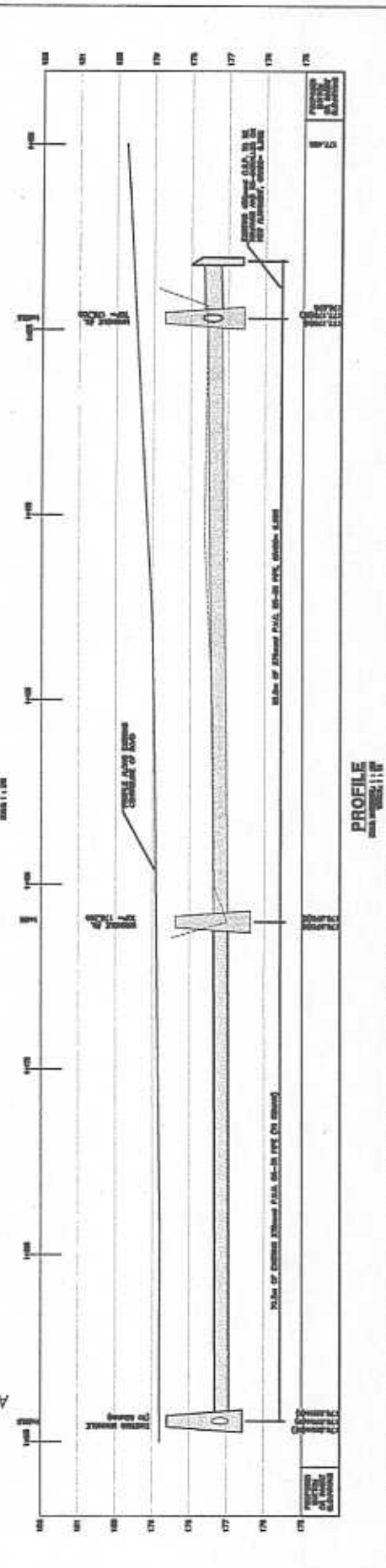
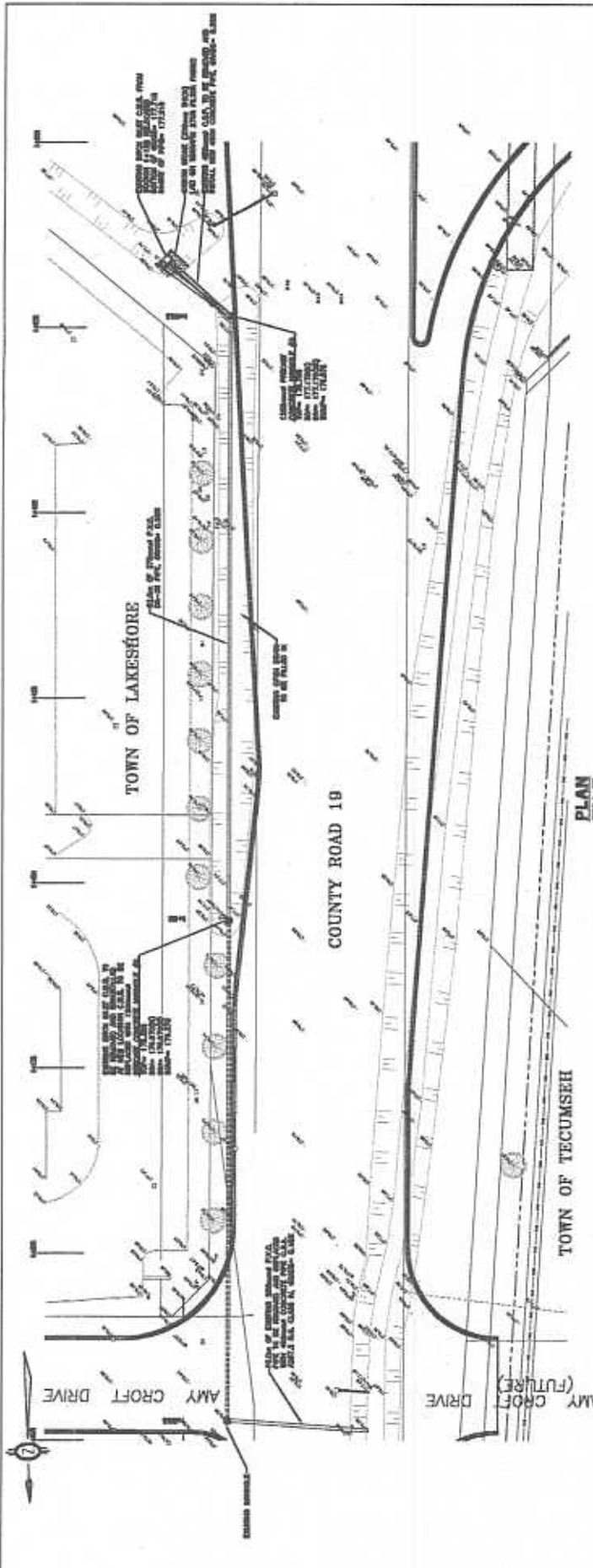




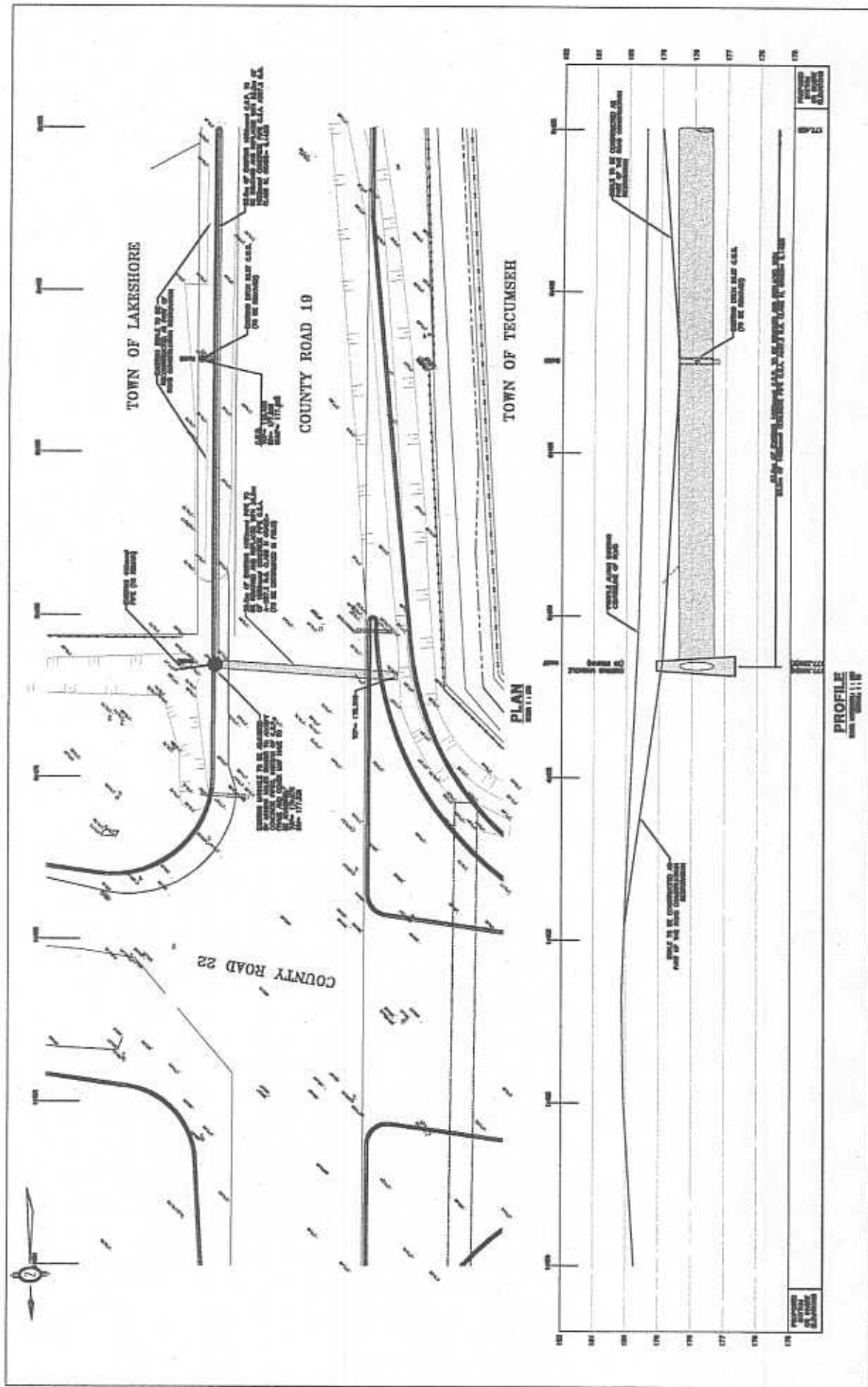
<b>R. LUCENTE ENGINEERING INC.</b> CONSULTING ENGINEERS <small>214 Main Street, 4th Fl.          Toronto, Ontario, Canada          M5T 1S7</small>	DATE	REVISIONS	PLAN & PROFILE STA. 1+400 TO STA. 1+587.60	 <b>BRUCE D. CROZIER</b> ENGINEERING INC. <small>CONSULTING ENGINEERS          1000 SHEPPARD AVENUE EAST          SUITE 100</small>	SHEET NO. <b>BC-04-007</b> DRAWING NO. <b>BC-2</b>
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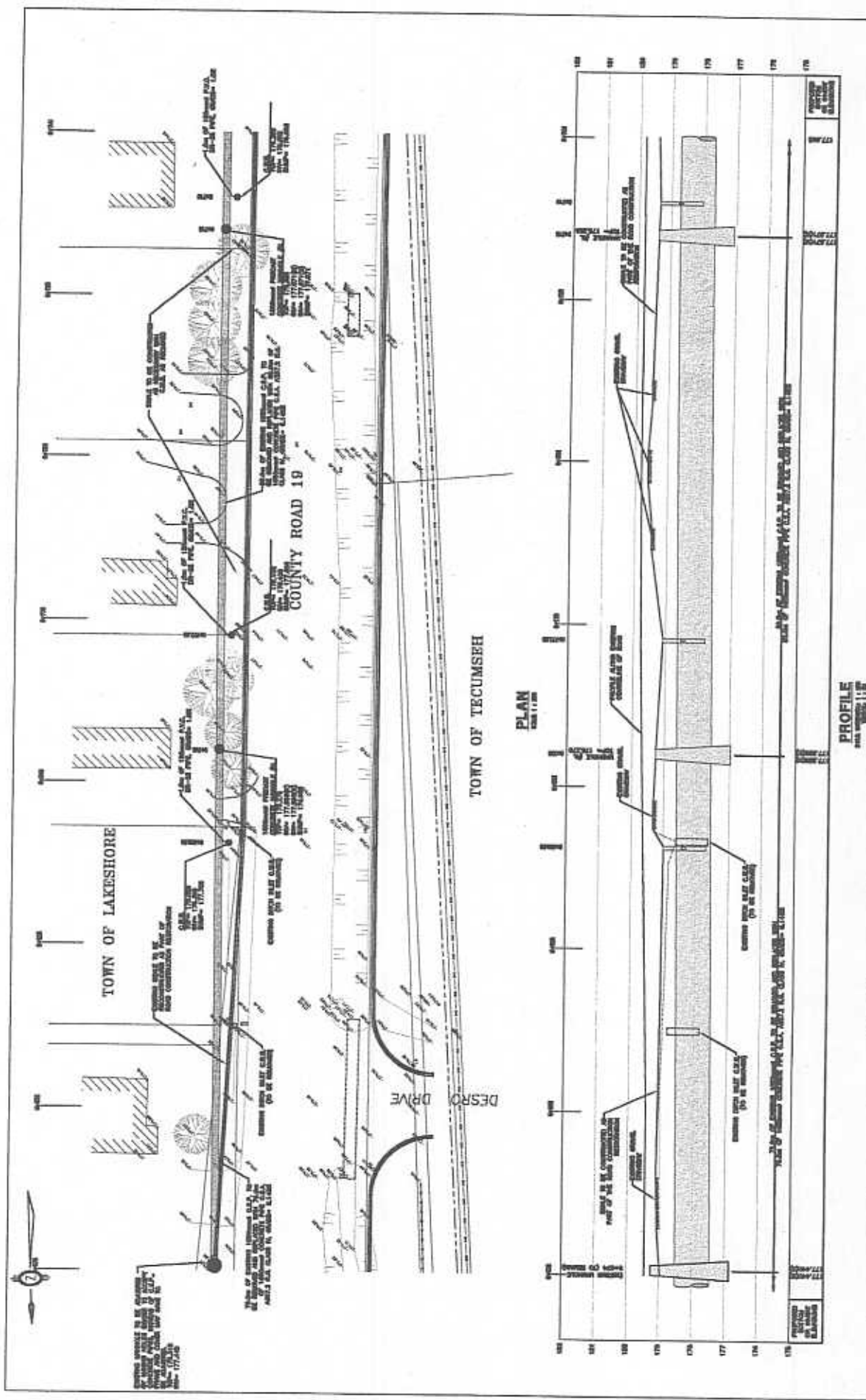
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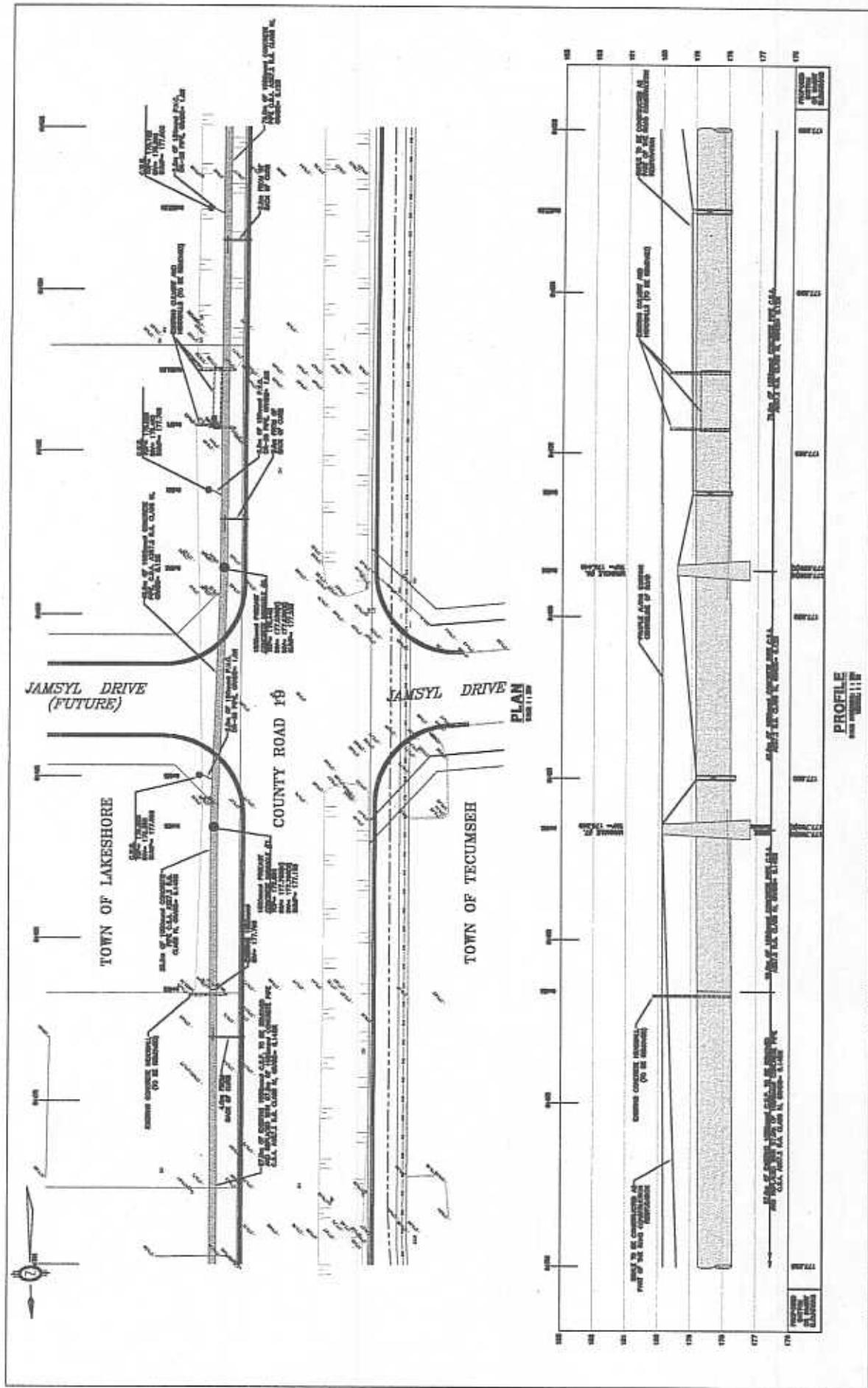
<b>R. LUCENTE ENGINEERING INC.</b> CONSULTING ENGINEERS 211 West 2nd St. #1 Tecumseh, MI 48860 Phone: (517) 251-0200 Fax: (517) 251-0200 E-mail: rlucente@rlucente.com	DATE: _____ REVISIONS: _____ DATE: _____ REVISIONS: _____ DATE: _____ REVISIONS: _____	PROJECT: MANNING ROAD DRAIN BRANCH 'A' TOWN OF LAKESHORE PLAN & PROFILE STA. 1+050 TO STA. 1+225	DATE: SEPT 16/05 AS NOTED BY: J.S. R.D.C.	BRUCE D. CROZIER ENGINEERING, INC. CONSULTING ENGINEERS 1000 W. 10th St. Tecumseh, MI 48860 Phone: (517) 251-0200 Fax: (517) 251-0200 E-mail: bcrozier@bcrozier.com	BC-04-007 DRAFT BC-4
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DRAFT	<b>R. LUCENTE ENGINEERING INC.</b> CONSULTING ENGINEERS <small>1111 10th St., S.E.   P.O. Box 1000   Tallahassee, Florida 32302   Tel: 904/209-1111</small>		DATE: _____ REVISIONS: _____ _____ _____ _____	PROJECT NO.: MANNING ROAD DRAIN TOWN OF LAKESHORE PLAN & PROFILE STA. 0+575 TO STA. 1+050	DATE: SEPT 16/05 AS NOTED BY: A.P. CHECKED BY: B.O.C.	BRUCE D. CROZIER ENGINEERING INC. <small>1000 N. W. 10th St.   Tallahassee, FL 32302   Tel: 904/209-1111</small>	PROJECT NO.: BC-04-007 DRAWING NO.: BC-5
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<b>DRAFT</b>	<b>R. LUCENTE ENGINEERING INC.</b> CONSULTING ENGINEERS <small>211 Main Street, S.W. #1          White Plains, Ontario, Canada          Phone: (905) 881-1111          Fax: (905) 881-1111          E-mail: rlucente@rlucente.com</small>	DATE: _____	REVISIONS: _____	PROJECT: MANNING ROAD DRAIN TOWN OF LAKESHORE PLAN & PROFILE STA. 0+700 TO STA. 0+875	DATE: SEPT 18/05 AS NOTED BY: A.P. P.D.C.		<b>BRUCE D. CROZIER</b> ENGINEERING INC. <small>CONSULTING ENGINEERS</small>	PROJECT NO.: EC-04-007
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<b>R. LUCENTE ENGINEERING INC.</b> CONSULTING ENGINEERS <small>242 North York St. #2          Toronto, Ont. M5T 1B7          Phone (416) 593-1888          Fax (416) 593-1889          E-mail rlucente@telus.net</small>	DATE: _____	REVISIONS: _____	PROJECT NO: <b>MANNING ROAD DRAIN</b> TOWN OF LAKESHORE	DATE: <b>SEPT 16/05</b> AS NOTED BY: <b>AP</b> CHECKED BY: _____ S.D.C.	<b>BRUCE D. CROZIER</b> ENGINEERING INC. <small>1000 Highway 7          Unit 100          Richmond Hill, Ont. L4B 1N2          Phone (905) 709-8888          Fax (905) 709-8889          E-mail bcrozier@bcrozier.com</small>	DRAWING NO: <b>BC-04-007</b>
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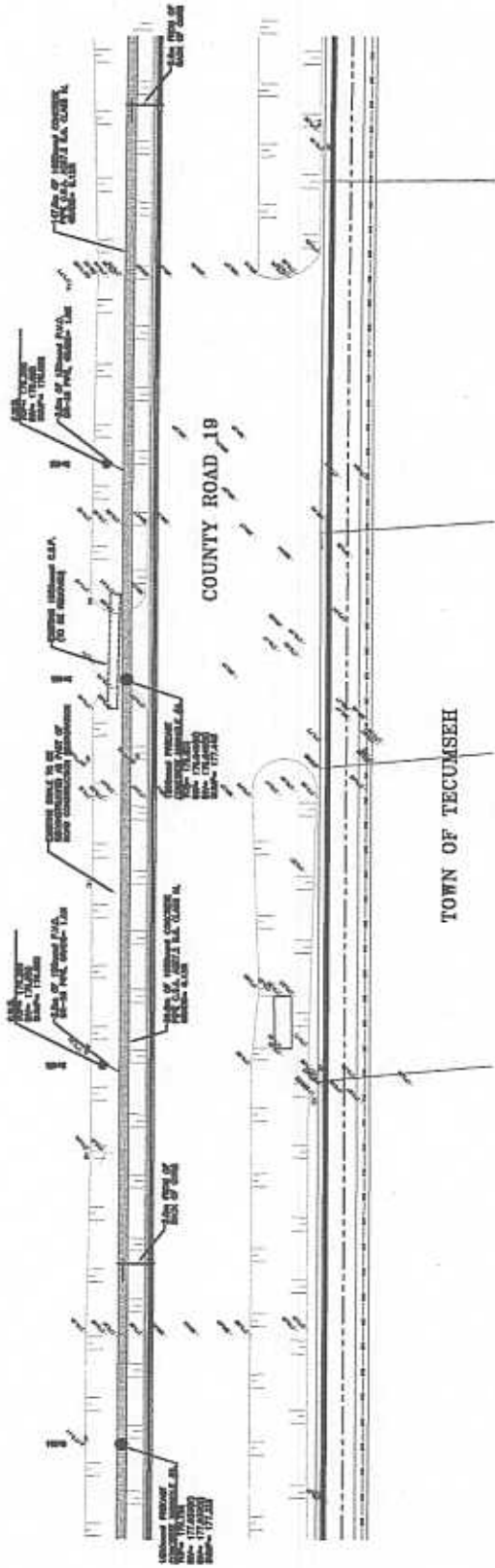
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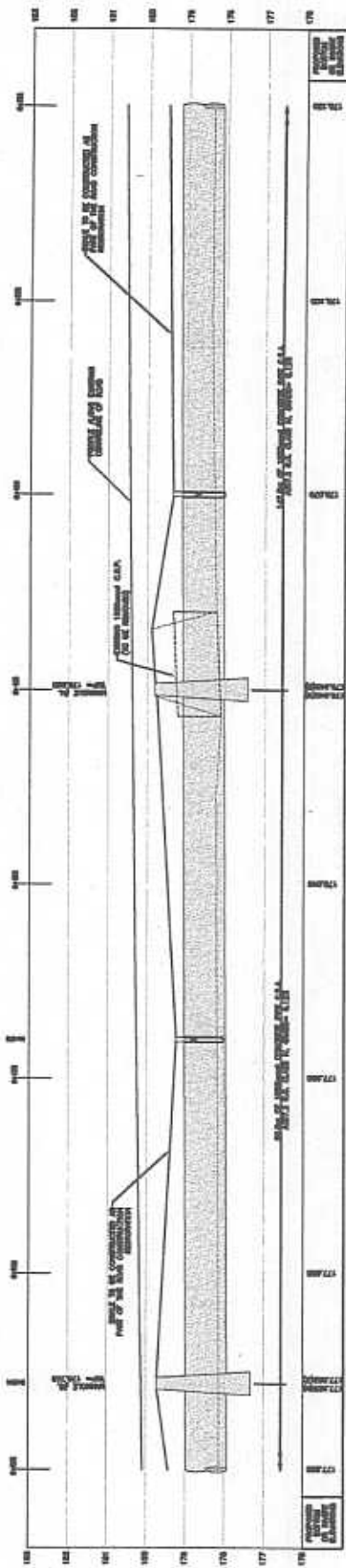


TOWN OF LAKESHORE



TOWN OF TECUMSEH

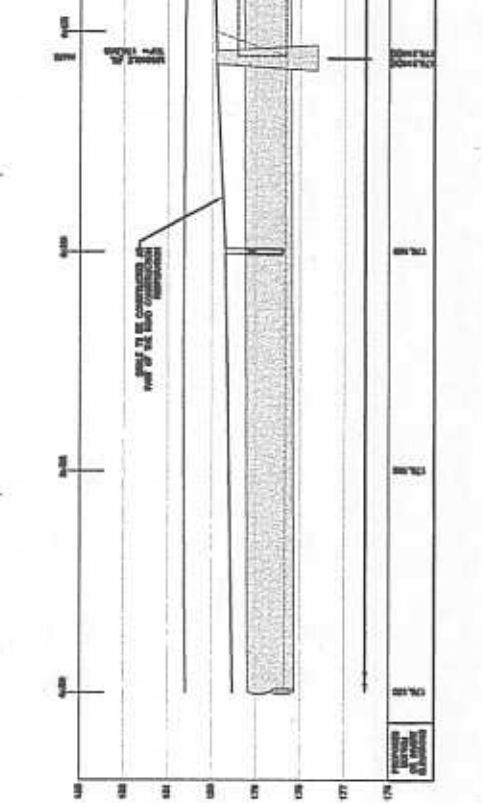
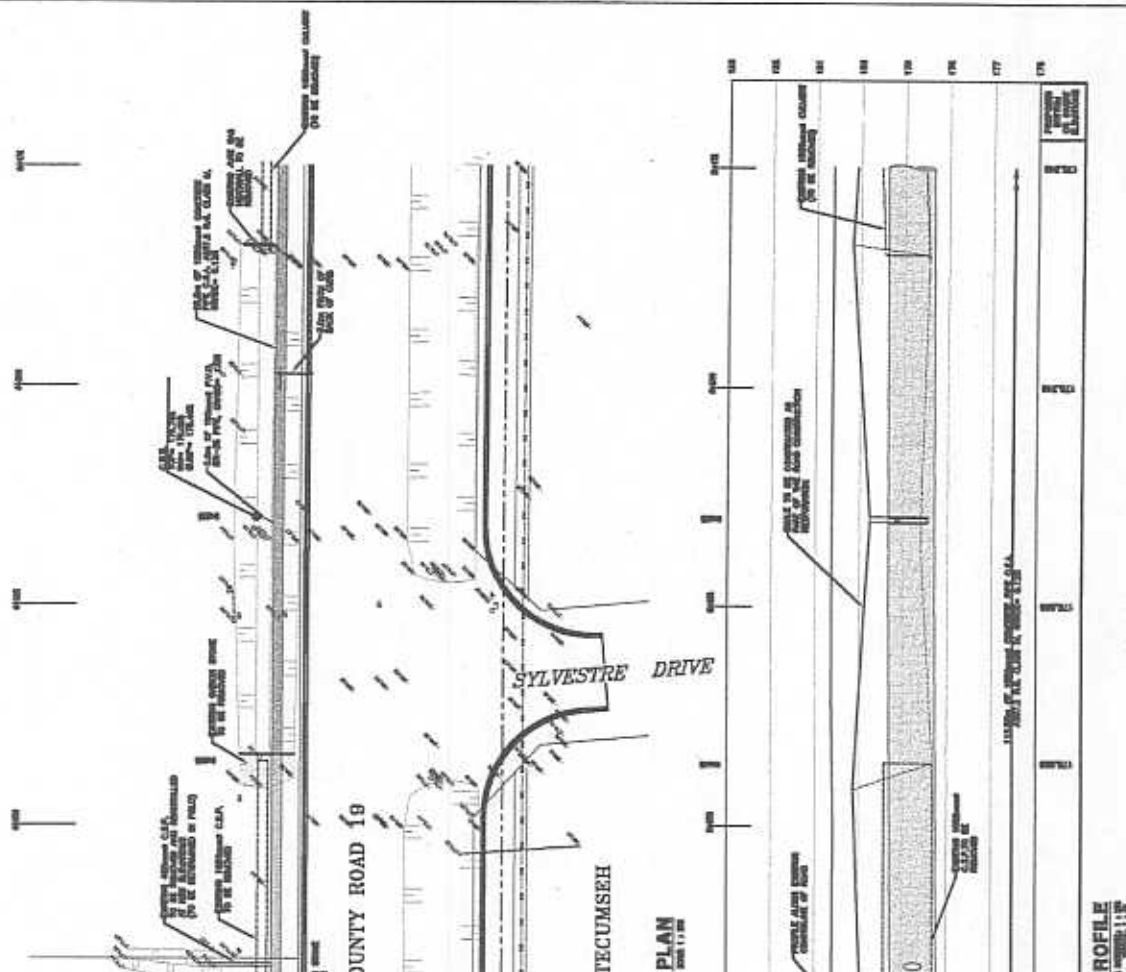
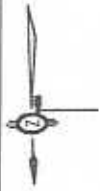
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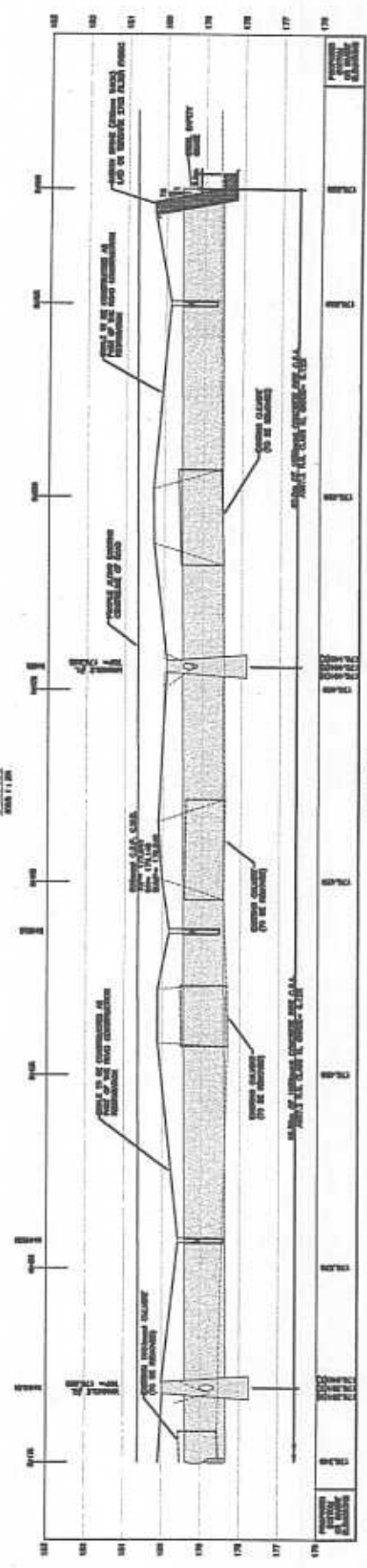
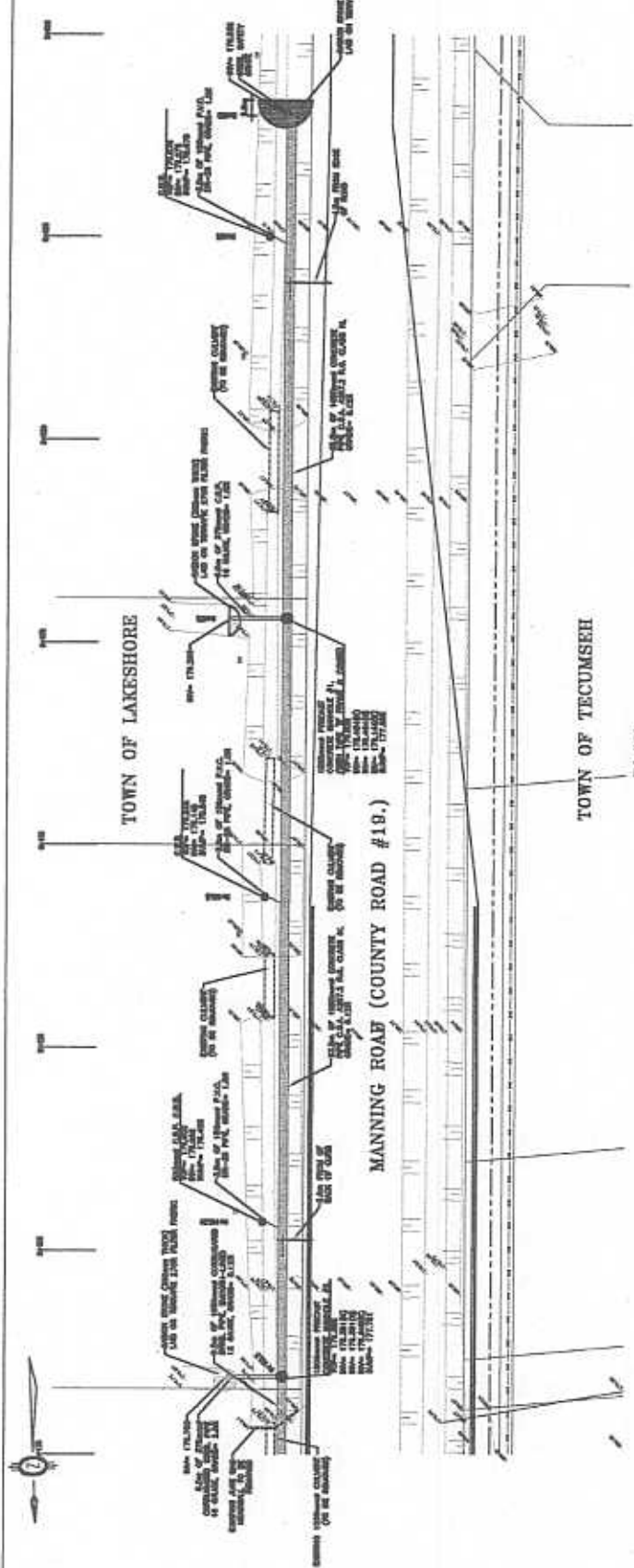
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DRAFT	R. LUCENTE ENGINEERING INC. CONSULTING ENGINEERS <small>1111 1/2 N. W. 1st St.          Miami Beach, Fla. 33132          Phone BR 1-3333          F-4044</small>	DATE _____	REVISIONS _____	DATE: SEPT 19/03 DRAWN BY: AS NOTED CHECKED BY: AP DESIGNED BY: B.D.C.		BRUCE D. CROZIER ENGINEERING INC. <small>CONSULTING ENGINEERS          1111 1/2 N. W. 1st St.          Miami Beach, Fla. 33132          Phone BR 1-3333          F-4044</small>	EC-04-007
		MANNING ROAD DRAIN TOWN OF LAKESHORE PLAN & PROFILE STA. 0+350 TO STA. 0+525	DRAFT	BC-8			





<b>DRAFT</b>	BC-04-007 DRAWING NO.	<b>BRUCE D. CROZIER</b> ENGINEERING INC. <small>CONSULTING ENGINEERS</small>	DATE REVISIONS	PROJECT <b>MANNING ROAD DRAIN</b> TOWN OF LAKESHORE	DATE AS NOTED BY B.D.C.	SHEET NO. <b>BC-9</b>
<b>R. LUCENTE ENGINEERING INC.</b> <small>CONSULTING ENGINEERS</small> 211 West Park, U.S.F. Tulsa, Okla., U.S.A.		PROJECT NO. 04-007 SHEET NO. BC-9		DATE: SEPT 16/06 AS NOTED BY: B.D.C.		PROJECT NO. 04-007 SHEET NO. BC-9



<b>R. LUCENTE ENGINEERING INC.</b> CONSULTING ENGINEERS <small>1111 Bloor Street East, Suite 204          Toronto, Ontario M4W 1A7          Tel: (416) 461-4600          Fax: (416) 461-4601</small>	DATE	REVISIONS	MANNING ROAD DRAIN TOWN OF LAKESHORE PLAN & PROFILE STA. 0+000 TO STA. 0+175	SPT 18/05 AS NOTED A.P. B.O.G.	 <b>BRUCE D. CROZIER          ENGINEERING INC.</b> <small>CONSULTING ENGINEERS          1000 SHEPPARD AVENUE EAST          SUITE 200          AURORA, ONTARIO L4G 1R7          TEL: (905) 709-7777          FAX: (905) 709-7778</small>	<b>DRAFT</b>	BC-04-007
	R. Lucente Engineering Inc. is a member of the Lucente Group of Companies.		PROJECT NO.	<b>DRAFT</b>			BC-04-007
	R. Lucente Engineering Inc. is a member of the Lucente Group of Companies.		DRAWING NO.				BC-10