OFFICE MEMORANDUM

DATE: January 24, 1995

TO: District Engineers

FROM: Mark Van Port Fleet
Engineer of Geotechnical & Geoenvironmental

SUBJECT: MDOT Pipe Study

Enclosed for your information is a copy of the final report prepared by Neyer, Tiseo, and Hindu Consultants, Ltd. (NTH) on the installed condition of randomly selected concrete, corrugated metal, and polyethylene pipe. The study was performed due to concerns with the installation practices and basically lack of information on the installed condition of our culvert and sewer systems. In general, most pipes were functioning as intended; however, each material type had some associated problems of which many were thought to be a result of installation deficiencies.

A joint committee comprised of representatives from the Michigan Road Builders Association and members of MDOT's Pipe Selection Task Group (PSTG) will meet on February 1, 1995, to discuss proposed changes to the construction specifications to correct the problems identified in the study. The intent is to obtain a better, long lasting, culvert and sewer system by enhancing the pipe installation and inspection practices. You will be kept appraised of the changes and of any responsibilities the district may assume.

The study was conducted in Districts 5, 7, 8, and Metro. These districts should review the study and determine if actions should be take on particular pipe sections that indicate a need for immediate action or monitoring. Some of the pipe sections may be on contracts that are still active. Corrective action should be taken immediately on those contracts before final acceptance of the project.

If you have any questions, please call at (517) 322-5660.

MATERIALS & TECHNOLOGY DIVISION

MVPF:jr
cc: R. A. Welke
L. Kinney
C. Roberts
Pipe Task Group

TRANSPORTATION COMMISSION
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STATE OF MICHIGAN

JOHN ENGLER, GOVERNOR

DEPARTMENT OF TRANSPORTATION

MATERIALS AND TECHNOLOGY DIVISION
SECONDARY GOVERNMENTAL COMPLEX
POST OFFICE BOX 30049, LANSING, MICHIGAN 48909
PHONE: (517) 322-1087 FAX: (517) 322-5664

PATRICK M. NOWAK, DIRECTOR

January 3, 1995

Mr. Larry Martin, Executive Director
Michigan Road Builders Association, Inc.
610 W. Ottawa Street
P. O. Box 13130
Lansing, Michigan 48901

Dear Mr. Martin:

Michigan Department of Transportation Pipe Study

In August of 1992, the Michigan Department of Transportation (MDOT) established a Pipe Selection Task Group (PSTG) to develop recommendations for using equal alternatives for pipe in various situations encountered by the department. In support of the PSTG's on-going efforts, the department contracted in July of 1994 with the firm NTH Consultants, Ltd. to study the condition of recently installed concrete, corrugated metal, and polyethylene culvert and sewer pipe. As part of our review process, we have enclosed a copy of the study for your information. We request the Michigan Road Builders Association (MRBA) to appoint members to sit on a joint committee to review the study findings.

The PSTG reviewed the pipe study report submitted by NTH Consultants, Ltd. and forwarded its conclusions and recommendations to the Engineering Operations Committee (EOC) for approval at the December 9, 1994, meeting. The EOC tentatively approved the conclusions and recommendations, with the following stipulations.

1. The pipe study needs various minor editorial changes. A final copy of the study will be made available to the Michigan Road Builders Association (MRBA) on January 3, 1995.

2. Several of the PSTG's recommendations should include input from the MRBA. The MRBA will be requested to provide members to sit on a joint committee to discuss proposed changes to the specifications, in particular for items 1, 2, and 4 of the PSTG recommendations.

3. The joint committee's recommendations will be presented to the EOC for their review at the February meeting, or at a special meeting scheduled at the end of January to discuss the pipe specification changes.

A copy of the PSTG's conclusions and recommendations are included for your comment. Please provide Mark A. Van Port Fleet, the PSTG Chairperson, the names of the MRBA members who will sit on the joint committee. The joint committee will be limited to six MRBA representatives. Three should be representative of the three major pipe material manufacturers, one for each material type. The remaining three should include representation from contractors with strong experience in culvert and sewer installation. It is intended that the first meeting of the group will be in the second week of January. It is hoped that only one or two meetings will be necessary to accomplish this endeavor.

Please provide Mark with the MRBA representatives by January 6, 1995. Mark can be reached at (517) 322-5660. The issue of pipe material use, installation, and inspection has been a sensitive one over the past year. We are seeking your continued support to help facilitate our specification modification process to assure a fair and equitable pipe specification, while also ensuring that MDOT is delivered an installed pipe system that will function as intended for the expected design life.

Thank you in advance for your early attention to this issue. If you have any questions you can contact me or Mark A. Van Port Fleet.

Sincerely,

Robert A. Welke
Deputy Director - Highways

BH:M/T:MVPF:jr

Enclosures

cc: L. A. Kinney
G. D. Taylor
C. Roberts
C. J. Arnold
Pipe Selection Task Group

November 29, 1994

PIPE STUDY

BACKGROUND

The Engineering Operations Committee (EOC) on April 14, 1994, directed M&T Division to conduct a "...field inspection of existing plastic culverts and sewers, as well as corrugated metal and concrete pipes of similar sizes." In conjunction with this study, a moratorium on the use of Plastic Pipe was invoked on June 4, 1994, until this field inspection and study was completed. On July 21, 1994, the Michigan Department of Transportation (MDOT) contracted with the firm Neyer, Tiseo, and Hindu Consultants, Ltd. to complete an investigation consisting of cleaning and video taping the installed condition of polyethylene, concrete, and corrugated metal storm sewer and culvert pipe. Preparing a condition assessment of the pipe was also included in the study. Polyethylene pipe was additionally mandrel tested. Two separate contracts were awarded based on geographical areas to complete the study. The combined contracts cleaned and inspected a total of 8,397 feet (3142 feet concrete, 1227 feet corrugated metal, and 4028 feet of polyethylene pipe) of pipe. The final quantity of each pipe material inspected differed from the initial proposed quantities. Some of the actual materials installed were different than expected and one segment of the US-31 project in Berrien County was deleted from construction. The Pipe Selection Task Group has reviewed the condition assessment report and has the following conclusions and recommendations.

CONCLUSIONS

The field inspections identified deficiencies in each of the three pipe materials inspected at specific locations. The consultant reports that the deficiencies are probably attributable to installation/inspection procedures during construction. Corrective measures for specific deficiencies are being investigated.

The use of the three types of pipe material did not consistently exhibit any significant product deficiencies that would warrant exclusion of any of these three products from use on MDOT projects. Therefore, the Pipe Selection Task Group recommends that the moratorium on the use of plastic pipe be removed.

RECOMMENDATIONS

The following recommendations of the Pipe Selection Task Group are based on the review of the consultant's report, a review of the inspection video tape, and a review of all known installed pipe problems.

1. Remove the moratorium on the use of plastic pipe as currently specified and revise the current specifications to include video inspection of a percentage (50

percent?) of all culverts and sewers installed. This will verify the pipes have been cleaned prior to final acceptance and will identify damaged or defective pipe materials.

2. Initiate a contractor/MDOT inspector training program on the handling, installation, and inspection process for each product. Develop an inspector checklist to assist staff in assuring proper installation techniques. The MDOT personnel trained should include the Construction Technician actually performing the installation inspection.

3. Repeat the inspection on selected pipe from this study within the next two years and again within five years to monitor and evaluate rates of deflection of the flexible pipe systems, crack propagation in concrete pipe, and the general system performance of each product.

4. Direct the Pipe Selection Task Group to: review the mandrel test criteria for acceptance, modification (possible rerounding), and/or rejection for inclusion in the Specifications. (An example would be a deflection performance criteria of 5 percent passing, >5 to 7 percent (reround), > 7 percent failing (remove and replace).

5. Develop a collapsible mandrel(s) that can measure the deflection in a pipe length. This will assist in the monitoring of polyethylene or other flexible pipe materials to establish long term data on pipe deflection.

6. M&T Division and Construction Division should add the following information to the pipe studied in this report:
   - Depth of cover
   - Class of pipe called for on the plans
   - Supplier of pipe installed
   - Construction inspection reports and density test taken during the pipe installation

   Using the existing depth of cover and class of pipe installed review the design for selected concrete pipe sections do determine if proper class requirements.

November 29, 1994

APPENDIX B
PIPE SELECTION CRITERIA

It was recommended by the EOC in their April 14, 1994, meeting minutes that a pipe study be performed to evaluate the installed condition of culvert and sewer pipe on state trunkline projects. The selected pipes would consist of 50 percent polyethylene pipe, 25 percent concrete pipe and 25 percent corrugated metal pipe.

The pipe task group discussed the recommendation and determined that it would be most appropriate to investigate polyethylene pipe that had been installed according to the most current specifications which includes a o-ring type gasket. The basis for this determination is that many changes have been incorporated into the specification since the Department first installed polyethylene pipe to correct problems which had surfaced in our initial installations. The task group saw no merit in inspecting a pipe system which is no longer specified, such as single wall corrugated polyethylene pipe.

Since the inspection of polyethylene pipe would review only recently installed pipe, it was determined that the study would also review only recently installed concrete and corrugated metal pipe systems.

The pipe task group requested the Construction Resident Engineers to provide the locations where polyethylene and corrugated metal pipes had been recently installed. A listing of locations was assembled. From this list specific lengths of pipe would be selected for the study. Design was requested to indicate where storm sewers had recently been let and constructed. It was assumed that those locations provided by design and not indicated by the Resident Engineers as polyethylene or corrugated metal pipe were concrete pipe installations.

The projects were sorted by material type and then numbered. A random number program was used to select the projects to be included in the study. A random number sheet was then used to select the specific pipe locations within each project to be inspected. Several locations, such as I-75 in Detroit, were excluded due to high traffic volumes and the potential disruption to traffic and the safety risk to individuals performing the study. Pipes located in the upper peninsula and the upper lower peninsula were excluded in order to minimize the mobilization costs of the contracts. Most of the corrugated metal pipe identified by the Resident Engineers was located in the northern parts of Michigan which made the expected mobilization costs increase. Therefore, a lesser percentage of corrugated metal pipe inspection was proposed. A total of 8,523 lineal feet of pipe (2246 feet concrete, 4526 feet polyethylene, and 1751 feet corrugated metal pipe). The locations were then divided by geographical area into two contracts, one being the metro area and the other being the western lower half of the lower peninsula.

NTH Consultants, Ltd.

Report on

Closed Circuit Television Survey of Selected Sewers and Culverts Southeastern, Michigan MDOT Project No. ND94-1761

Prepared for:
Michigan Department of Transportation
Lansing, Michigan

Project No 34-4422-00
December 21, 1994

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NTH Consultants, Ltd.
Professional Engineering and
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277 Gratiot
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(313) 965-0036
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Mr. Mark A. Van Port Fleet, P.E.
Michigan Department of Transportation
Materials and Technology Division
8885 Ricks Road
P.O. Box 30049
Lansing, Michigan 48909

December 21, 1994
Proj. No. 34-4422-00

RE: Pipe Inspection Contract No. 1
MDOT Project No. ND94-1761

Dear Mr. Van Port Fleet:

NTH Consultants, Ltd. is pleased to submit the results of our Closed Circuit Television Survey of Selected Sewers and Culverts in Southeastern Michigan. We have revised this report in accordance with your request. Our study was performed in accordance with the Michigan Department of Transportation's Special Provisions for Cleaning and Videotaping and Mandrel Testing of Existing Sewers and Culverts.

We appreciate this opportunity to have been of service to you. Should you have any questions, please call us at 313-965-0036.

Sincerely,

NTH Consultants, Ltd.

Harry R. Price, P.E.
Senior Project Engineer

Frederick R. Janeczko, P.E.
Project Manager

HRP/FRJ/jw

Attachments

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From the ground up
1968 - 1993

25th

EXECUTIVE SUMMARY

NTH Consultants, Ltd. under contract with the Materials and Technology Division of the Michigan Department of Transportation performed a closed circuit television (CCTV) survey of 43 test sections of culverts and storm sewer in Southeastern, Michigan. The storm sewers and culverts ranged in size from 12-inches to 24-inches in diameter and in length from 38 feet to 306 feet. The test sections had a total combined length of 4,646 lineal feet, located at 8 general sites. The 4,646 lineal feet of pipe consisted of 1,512 lineal feet of concrete pipe, 465 lineal feet of corrugated metal pipe and 2,669 lineal feet of polyethylene pipe. The pipe data is summarized on Plate 0-1 in Appendix A.

Within the 1,512 lineal feet of concrete pipe surveyed, there was one broken pipe at site 6-1. Five sites had single cracked areas and seven sites had multiple cracked areas. Six open joints were found.

Within the polyethylene pipe surveyed, there were 32 localized dips in the pipes invert. Mandrel testing was performed on 1,754 lineal feet of polyethylene pipe, of which 907 lineal feet (52 percent) did not pass. The percent of Polyethelene Pipe not passing the mandrel testing is only indicative of the inability of the mandrel passing specific locations. It is possible the pipe lengths between the locations where the mandrel failed are within the allowable specifications of less than five percent deflection. The remaining 847 lineal feet (48 percent) of the pipe mandrelled falls within the allowable specifications of less than five percent deflection. There were 4 sections of polyethylene pipe (test sections 4-1, 4-6, 4-7, and 4-8) which were not Mandreled because ongoing construction prevented access to both ends of these test sections. At site No. 5-1, the Mandrel test was not performed because the 24-inch Mandrel would not fit through the standard manhole frame. It should be noted that MDOT specifications for Mandrel tests call for the Mandrel to pass at 95 percent of nominal pipe diameter, whereas, ASTM specifications calls for 95 percent of the base inside diameter as determined by the Uniball Association. This could result in a situation where some of the

pipe could fail one test and not the other. Mandrel tests were not specified for the corrugated metal pipe, however, visual inspection indicates there is some deflection present in this type of pipe.

Based on the survey performed, there are two areas which require prompt corrective measures. These are sites 1-2 and 6-1 (sewer blocked downstream of test section and the broken concrete pipe). The remainder of the problems encountered do not require immediate attention. The attached report summarizes our observations, presents our evaluation of the individual test sections and presents our recommendations relative to remedial measures.

The majority of pipe sections were cleaned of mud and debris prior to the CCTV survey. In general, all storm sewers were found to have no significant amounts of mud and debris. The exceptions to this were at sites 1, 4, 5 and 6 where a total of 13 cubic yards of material was removed. The culverts, on the other hand, were found to be approximately 50 percent full of mud and debris. There were no known hazardous material found at any of the sites.

The field reports prepared by Inland Waters Pollution Control, Inc. and the NTH pipe evaluation forms refer to PVC glued joint pipes being inspected as part of this study. These locations are actually smooth wall polyethylene pipe with O-ring joints. It was determined not to alter the field notes, but to place this corrective statement in the summary report.

1.0 INTRODUCTION

This report presents the results of a closed circuit television (CCTV) condition survey of a series of selected storm sewers and culverts in Southeastern, Michigan. The specific locations to be tested were selected by the Michigan Department of Transportation's Materials and Technology Division. It is our understanding that the individual test locations were randomly selected and represent concrete pipe, corrugated metal pipe and polyethylene pipe installations. The individual test locations are shown on segments of the contract plans for each test site, copies of which are appended hereto as Plate 1-1 through Plate 8-3. The first number is the MDOT site designation and the second number is a test location number assigned by NTH.

Authorization to perform this study was provided by MDOT in the form of an authorization letter dated July 22, 1994.

2.0 SCOPE OF STUDY

The purpose of this investigation was to document the present condition of the selected storm sewers and culverts, obtain sufficient data to assess the present condition of the selected pipes and to evaluate the probable cause or causes of any observed distress. In addition, this report also addresses remedial measures for the distressed lines. Specifically, this report presents our observations and evaluations regarding the following items:

1. Documentation of the type and distribution of any observed distress.

2. An assessment of overall condition of the individual test sections.

3. Documentation and evaluation of the Mandrel testing of the sewers constructed using polyethylene pipe.

4. An evaluation of the probable cause or causes of the observed distress.

5. A discussion of remedial measures based on the applicable conditions observed.

2.1 SITE NO. 1

Site No. 1 was located on M-24 (Dixie Highway) between Hatchery Road and M-15 in northern Oakland County. The MDOT designation for Site No. 1 was 63053-13600A. Four sections of storm sewer were surveyed within this site on September 6, 1994. For identification purposes, the individual sections will be identified as Section Nos. 1-1 through 1-4. The individual section designations will also be utilized on all supporting information.

Section 1-1 is a 57-foot long run of 12-inch diameter concrete storm sewer that crosses M-24 at Station 276+35. The storm sewer was cleaned of mud and debris with a high pressure water

jet prior to the CCTV survey. The observations made during the survey indicate that the pipe is in good condition. A deposit of what appears to be concrete or mortar is present between 53 and 57 feet from Manhole "A".

Section 1-2 is a 56-foot long run of 18-inch diameter concrete storm sewer that crosses M-24 at Station 280+40. The storm sewer was cleaned of debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the concrete pipe is in good condition. However, the bottom half of the pipe was full of water even though pumping was provided. The system downstream of the above referenced pipe is apparently plugged and should be checked.

Section 1-3 is a 50-foot long run of 12-inch diameter concrete storm sewer that crosses M-24 at Station 343+20. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the pipe is in good condition. However, a longitudinal crack at 10-feet from Point "A" was observed. Point "A" is located on the south side of the road. A heavy deposit of concrete was also observed to be present in the catch basin at Point "B", located on the north side of the road.

Section 1-4 is a 97-foot long section of 15-inch diameter concrete storm sewer that runs along the shoulder of M-24 between Stations 412+40 and 413+40. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the storm sewer is in good condition. However, one minor longitudinal crack was observed at a point 28 feet from Point "A" (Station 412+40).

Refer to Figure Nos. 1-1 through 1-4 for detailed accounts of the individual surveys and to Plate Nos. 1-1 through 1-4 for detailed locations of the individual test sections.

2.2 SITE NO. 2

Site No. 2 was located on M-59 between I-75 and M-150 (Rochester Road) in Rochester Hills and Auburn Hills, Michigan. The MDOT designation for Site No. 2 was 63043-26069A. Three sections of storm sewer were surveyed within this site on September 6, 1994. For identification purposes, the individual sections will be identified as Section Nos. 2-1 through 2-3. The individual section designations will also be utilized on all supporting information.

Section 2-1 is a 167-foot long section of 18-inch diameter concrete storm sewer that runs along eastbound M-59 from Station 67+00 to Station 68+70. Based on the observations made during the survey, the pipe appears to be in fair to good condition. However, several longitudinal cracks were observed at scattered locations throughout the pipe. The cracks could have resulted from variation in bedding and lateral pipe support. Point "A" is located on the south side of the road.

Section 2-2 is a 99-foot long section of 12-inch diameter concrete storm sewer that crosses eastbound M-59 at Station 107+43. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that this section of sewer is in fair condition. Several cracks, both longitudinal and circumferential were observed to be present at several locations within the pipe. In addition to the cracks, minor seepage was observed at three of the cracks. A deposit of concrete/mortar was also observed on the invert of the pipe in an area between 82 and 90 feet from Point "A". The cracks in the pipe are most likely due to insufficient bedding support.

Section 2-3 is a 93-foot long section of 12-inch diameter concrete storm sewer that crosses westbound M-59 at Station 131+06. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicated that this section of sewer is in good condition. However, two joints were observed to be displaced. Both of the joints were observed to be offset horizontally approximately 10

percent. Two minor circumferential cracks were also present within this section. The displaced joints are most likely due to damage during construction.

Refer to Figure Nos. 2-1 through 2-3 for detailed accounts of the individual surveys and to Plate Nos. 2-1 through 2-3 for detailed locations of the individual sections.

2.3 SITE NO. 3

Site No. 3 was located on US-12 between Harris Road and the Wayne County/Washtenaw County line. The MDOT designation for Site No. 3 was 81032-26955A. Six sections of storm sewer were surveyed within this site on September 1, 1994. For identification purposes, the individual sections will be identified as Section Nos. 3-1 through 3-6. The individual section designations will also be utilized on all supporting information.

Section 3-1 is a 306-foot long section of 15-inch diameter polyethylene pipe that runs along the northern shoulder of US-12 between Station 138+00 and Station 135+00. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the observations made during the survey, the sewer appears to be in good condition. However, the pipe did appear to be slightly egg shaped. The ovalness of the pipe was confirmed by the Mandrel testing when the Mandrel was only able to travel 20 feet from Point "B" (Station 135+00) towards Point "A". The contractor then re-installed the Mandrel into sewer at Point "A" (Station 138+00) where the Mandrel was only able to travel 40 feet towards Point "B".

Section 3-2 is a 65-foot long run of 12-inch diameter polyethylene pipe that crosses US-12 at Station 164+00. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey and the Mandrel testing indicate that the pipe is in good conditions. No defects were observed other than a slight dip in invert elevation between 4 and 20 feet from Point "A". Point "A" is located on the

south side of US-12. The variation in the pipes invert elevation are most likely due to variations in grade during construction.

Section 3-3 is a 67-foot long run of 12-inch diameter polyethylene pipe that crosses US-12 at Station 170+30. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the observations made during the survey and the Mandrel testing, the sewer appears to be in good condition. No defects were observed other than two slight dips in the pipes invert elevation between 4 and 44 feet, and at 56 feet from Point "A". Point "A" is located on the south side of US-12. As previously mentioned, the minor dips in the invert elevation were most likely the result of variations in grade during construction.

Section 3-4 is a 72-foot long run of 12-inch diameter polyethylene pipe that crosses US-12 at Station 199+95. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the observations made during the survey and the Mandrel testing, the pipe appears to be in good condition. One section of the pipe between 30 and 68 feet from Point "A" (located on the south side of US-12) was observed to have a slight dip. The slight dip was most likely the result of a variation in grade during construction.

Section 3-5 is a 69-foot long run of 12-inch diameter polyethylene pipe that runs roughly in an east/west direction in the median from Station 304+72 to Station 305+30. The storm sewer was cleaned of mud and debris prior to the CCTV. The observations made during the survey and the Mandrel testing indicate that the pipe is in good condition.

Section 3-6 is an 76-foot long section of 12-inch diameter concrete pipe that crosses westbound US-12 at Station 216+00. The storm sewer was cleaned of mud and debris prior to the CCTV survey. Based on the observations made during the survey, it appears that the pipe is in good condition. However, the section of pipe between Point "A" (located in the median of US-12) and 60 feet north from Point "A" was observed to have between 2 and 4 inches of water in the

pipe. The accumulated water was due to a dip in the pipe which is most likely due to a variation in grade during construction.

Refer to Figure Nos. 3-1 through 3-6 for detailed accounts of the individual surveys and to Plate Nos. 3-1 through 3-6 for detailed locations of the individual sections.

2.4 SITE NO. 4

Site No. 4 was located on M-59 between Hayes Road and Romeo Plank Road in Macomb County. The MDOT designation for Site No. 4 was 50022-0564. Nine sections of storm sewer were surveyed within this site on September 7, 1994. The contract originally called for only eight sections within the site but an additional section (Station 472+82 referred to as Section 4-9) was surveyed at the request of the MDOT field inspector. For identification purposes, the individual sections will be identified as Section Nos. 4-1 through 4-9. The individual section designations will also be utilized on all supporting information.

Section 4-1 is a 52-foot long run of 12-inch diameter polyethylene pipe that crosses westbound M-59 at Station 393+85. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the pipe is in good condition. Mandrel testing was not possible in this section due to ongoing construction activities which blocked the access to one end of the pipe.

Section 4-2 is a 53-foot long run of 12-inch diameter polyethylene pipe that crosses westbound M-59 at Station 465+50. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the results of the survey and the Mandrel testing, the storm sewer appears to be in good condition.

Section 4-3 is a 153 foot long section of 18-inch diameter polyethylene pipe that runs along the north edge of westbound M-59 between Station 462+40 and Station 463+95. The storm sewer

was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey and Mandrel testing indicate that the pipe is in good condition. However, two slight dips in the pipe were observed during the survey. The dips in the pipe were located at 4 feet and 144 feet from access Point "A" (Station 462+40). The dips in the pipes invert elevation are most likely the result of variation in grade during construction.

Section 4-4 is a 53-foot long section of 12-inch diameter polyethylene pipe that crosses westbound M-59 at Station 417+00. The storm sewer was cleaned of mud and debris with a high pressure water jet. Based on the observations made during the survey and the Mandrel testing, it appears that the pipe is in good condition. No other defects other than a slight dip in the pipes invert elevation at 33 feet from access Point "A" (located on the north side of the road) were observed.

Section 4-5 is 55-foot long run of 12-inch diameter polyethylene pipe that crosses westbound M-59 at Station 406+15. The storm sewer was cleaned with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicated that the pipe was in good condition other than a slight dip in the pipes invert elevation at 51 feet from access Point "A". Access Point "A" is located on the north side of the road. However, some deformation was noted based on the Mandrel testing. The contractor was only able to advance the Mandrel 5 feet from access Point "A" towards "B" and 10 feet from access Point "B" towards Point "A".

Section 4-6 is 65-foot long section of 12-inch diameter polyethylene pipe that crosses eastbound M-59 at Station 407+20. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the observations made during the survey, the pipe appears to be in good condition. No Mandrel testing was possible at this location due to ongoing construction activities near access Point "B", which is located on the south side of M-59.

Section 4-7 is a 51-foot long run of 12-inch diameter polyethylene pipe that crosses eastbound M-59 at Station 426+45. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the pipe is in good condition. No Mandrel testing was possible at this time due to ongoing construction operations near access Point "B", which is located on the south side of M-59.

Section 4-8 is a 262-foot long section of 24-inch diameter polyethylene pipe that runs along the southern edge of eastbound M-59 between Station 459+55 and Station 462+25. No cleaning of this storm sewer was performed prior to the CCTV survey due to an ongoing construction activities at the site which precluded truck access for cleaning. The observations made during the survey indicate that the pipe is in good condition other than a slight dip in the pipe at 232 feet from access Point "A" (located at Station 462+25). No Mandrel testing was performed due to the lack of a Mandrel for the 24 inch pipe. However, the manhole castings on both ends of this line would have precluded using a 24-inch Mandrel because the Mandrel is larger than the inside diameter of the manhole frame.

Section 4-9 is a 250 foot long section of 24-inch diameter polyethylene pipe that runs along the south edge of eastbound M-59 between Station 472+82 and Station 475+32. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during survey indicate that the storm sewer appears to be in good condition. No Mandrel testing was performed in this section, as directed by the MDOT construction engineer.

Refer to Figure Nos. 4-1 through 4-9 for detailed accounts of the individual surveys and to Plate Nos. 4-1 through 4-9 for locations of the individual sections.

2.5 SITE NO. 5

Site No. 5 was located on M-3 (Gratiot) between Henry Joy Road and 23 Mile Road in Macomb County. The MDOT designation for Site No. 5 was 50051-26738A. Five sections of storm sewer were surveyed within this site on September 8 and 9, 1994. For identification purposes, the individual sections will be identified as Section Nos. 5-1 through 5-5. The individual section designations will also be utilized on all supporting information.

Section 5-1 is a 235-foot long run of 24-inch diameter polyethylene pipe that runs along the east side of M-3. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the observations made during the survey, it appears that the pipe is in good condition. However, dips in the pipe were observed at several locations during the survey. No other defects were observed during the survey. Mandrel testing was not performed because the 24-inch Mandrel could not be inserted through the manhole frame because of its size.

Section 5-2 is a 80-foot long section of 12-inch diameter concrete storm sewer that runs along the west side of M-3 from Station 141+80 to Station 140+90. The storm sewer was cleaned of mud and debris prior to the CCTV survey. The observations made during the survey indicate that the pipe is in fair to good condition. Cracks, both transverse and longitudinal were observed at several locations. In addition to the cracks found, several locations exhibited light infiltration of groundwater. The cracks are most likely related to poor bedding during construction. The infiltration and encrustation suggests seepage through the pipe wall that may be the result of sand or gravel pockets in the pipe's concrete. At the present time, the pipe is serviceable but should be re-inspected in the future.

Section 5-3 is a 68-foot long section of 12-inch concrete diameter storm sewer that runs along the west side of M-3 from Station 79+43 to Station 80+05. The storm sewer was cleaned of mud and debris with a high pressure water jet. Based on the observations made during the

survey, the pipe appears to be in good condition. No defects other than a longitudinal crack at 5 feet from access Point "A" (located on the east side of Gratiot) and a slight dip in pipe between 57 and 62 feet from access Point "A" was noted.

Section 5-4 is a 170-foot long run of 12-inch diameter polyethylene storm sewer that runs along the west side of M-3 between Station 55+30 and Station 57+00. The storm sewer was cleaned of mud and debris prior to the CCTV survey. Based on the observations made during the survey, the pipe appears to be in good condition. The observations made during the survey indicate that the pipe is in good condition other than several dips in the pipe that were observed. Based on the Mandrel testing, some deformation of the pipe was noted. The contractor was only able to advance the Mandrel from access Point "A" (Station 55+30) 3 feet towards Point "B" and from access Point "B" (Station 57+00) 25 feet towards Point "A". The dips in the pipe are most likely the result of a variation in grade during construction of variation in the density of the bedding material or backfill material.

Section 5-5 is a 253-foot long section of 18-inch diameter polyethylene storm sewer that runs along the east side of M-3 from Station 106+70 to Station 104+10. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the observations made during the survey, the pipe appears to be in good condition other than 3 slight dips in the pipe. A service connection was observed to be present at a point 129 feet from access Point "A", which is located at Station 106+70. However, some deformation in the pipe was noted based on the Mandrel testing. The contractor was only able to advance the Mandrel 5 feet from access Point "A" towards Point "B" and 58 feet from access Point "B" towards Point "A".

Refer to Figure Nos. 5-1 through 5-5 for detailed accounts of the individual surveys and to Plate Nos. 5-1 through 5-5 for locations of the individual sections.

2.6 SITE NO. 6

Site No. 6 was located on 12 Mile Road between the M-5 connector and Haggerty Road in Farmington Hills, Michigan. Ten sections of storm sewer were surveyed within this site on September 1 and 2, 1994. For identification purposes, the individual sections will be identified as Section Nos. 6-1 through 6-10. The individual section designations will also be utilized on all supporting information.

Section 6-1 is 84-foot long section of 12-inch diameter concrete storm sewer that crosses westbound 12 Mile Road at Station 91+90. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on observations made during the survey, the pipe appears to be in fair condition. The pipe is broken from the crown down towards the invert at 38 feet from access Point "A" (located in the median of 12 Mile Road). The damage is great enough to block the camera from bypassing the damaged area. Approximately 60 percent of the pipe is blocked at this point. The contractor then removed the camera and moved the camera to access Point "B" where the inspection moved from Point "B" to the damaged pipe section. As this pipe in under an unopened section, the broken pipe was most likely damaged during the ongoing construction activities. The MDOT construction group was advised.

Section 6-2 is a 51-foot long section of 12-inch diameter polyethylene storm sewer that crosses eastbound 12 Mile Road at Station 91+90. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the observations made during the survey, the pipe appears to be in good condition. A slight dip in the pipe located between 8 and 33 feet from access Point "A", which is located in the median of 12 Mile Road. Some deformation of the pipe was also noted based on the Mandrel testing. The contractor was only able to advance the Mandrel 8 feet from access Point "A". The contractor could not locate the catch basin at access Point "B" due to ongoing construction activities.

Section 6-3 is a 161-foot long section of 15-inch diameter concrete storm sewer in the median of 12 Mile Road between Station 91+90 and Station 90+25. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the observations made during the survey, it appears that the pipe is in good condition other than some minor cracking at two locations. The minor cracking observed appears to be the result of localized overstress.

Section 6-4 is a 53-foot long run of 12-inch diameter concrete storm sewer that crosses westbound 12 Mile Road at Station 99+75. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the pipe is in good condition. No defects were observed during survey.

Section 6-5 is a 52-foot long section of 12-inch diameter polyethylene storm sewer that crosses eastbound 12 Mile Road at Station 99+75. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey and the Mandrel testing indicate that the pipe is in good condition.

Section 6-6 is a 247-foot long section of 15-inch diameter polyethylene storm sewer that runs along the median of 12 Mile Road from Station 99+70 to Station 102+25. The storm sewer was cleaned of mud and debris with a high pressure water jet. Based on the observations made during the survey, it appears that the pipe is in good to fair condition. Dips in pipe were observed at several locations within this section of pipe. Some deformation of the pipe was revealed during the Mandrel testing when the contractor was only able to advance the Mandrel 5 feet into the pipe from both access points. The dips in the pipe are most likely due to a combination of a grade variation during construction and settlement of the bedding material.

Section 6-7 is a 41-foot long section of 12-inch diameter concrete storm sewer that crosses westbound 12 Mile Road at Station 113+45. The storm sewer was cleaned of mud and debris

with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the pipe is in good condition. No defects other than a joint that is slightly displaced were observed during the survey.

Section 6-8 is a 38-foot long section of 12-inch diameter concrete storm sewer that crosses westbound 12 Mile Road at Station 116+40. The storm sewer was cleaned of mud and debris prior to the CCTV survey. The observations made during the survey indicate that the pipe is in good condition. No other defects were observed.

Section 6-9 is a 38-foot long run of 12-inch diameter polyethylene storm sewer that crosses eastbound 12 Mile Road at Station 116+40. The storm sewer was cleaned of mud and debris prior to the CCTV survey. The observations made during the survey indicate that the pipe is in good condition. Some deformation of the pipe was noted based on the Mandrel testing. The contractor was only able to advance the Mandrel 25 feet from access Point "A" towards Point "B" located on the south side of 12 Mile Road. The Mandrel could not be advanced from access Point "B" due to debris in the catch basin.

Section 6-10 is a 50-foot long section of 12-inch diameter polyethylene storm sewer that crosses eastbound 12 Mile Road at Station 113+45. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the observations made during the survey, it appears that the pipe is in good condition. Some deformation of the pipe was noted based on the Mandrel testing. The contractor was only able to advance the Mandrel 5 feet from access Point "A" and 39 feet from access Point "B". Access Points "A" and "B" are located on the south side and north side of the road, respectively.

Refer to Figure Nos. 6-1 through 6-10 for detailed accounts of the individual surveys and to Plate Nos. 6-1 through 6-10 for locations of the individual sections.

2.7 SITE NO. 7

Site No. 7 was located on M-3 (Gratiot) between M-59 and 23 Mile Road in Macomb County. The MDOT designation for Site No. 7 was 50052-26738A. Three sections of storm culvert were surveyed within this site on September 8, 1994. For identification purposes, the individual sections will be identified as Section Nos. 7-1 through 7-3. The individual section designations will also be utilized on all supporting information.

Section 7-1 is a 195-foot long run of 12-inch diameter corrugated metal pipe that runs along northbound M-3 between Station 218+10 and Station 220+05. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Prior to the cleaning, the culvert was observed to be approximately 50 percent full of mud and debris. The observations made during the survey indicate that the culvert was in good condition. No defects were observed during the survey.

Section 7-2 is a 212 foot long section of 12-inch diameter culvert made up of 93 feet of concrete pipe and 119 feet of corrugated metal pipe. The culvert that runs along northbound M-3 from Station 224+10 to Station 226+20. The culvert was cleaned of mud and debris prior to the CCTV survey. Prior to the cleaning, the culvert was observed to be approximately 50 percent full of mud and debris. Based on the observations made during the survey, it appears that the culvert is in fair condition. There was some fine cracking noted in the concrete pipe sections and the joints between the concrete and metal pipe were displace. The most serious defects noted during the survey are two holes in the corrugated metal pipe. The holes which are located 56 feet and 60 feet from the access Point "A" are most likely the result of damage that occurred during construction. We recommend that the damaged sections of corrugated metal pipe be replaced. However, it is our opinion that the concrete pipe can be salvaged.

Section 7-3 is a 151-foot long section of 12-inch diameter corrugated metal pipe that runs along northbound M-3 between Station 248+19 and Station 249+70. The culvert was cleaned of mud and debris prior to the CCTV survey. Prior to the cleaning, the culvert was observed to be approximately 50 percent full of mud and debris. Based on the observations made during the survey, it appears that the culvert is in good to fair condition. However, a joint 4 feet from access Point "A" (Station 249+70) was observed to be open. It appears that a polyethylene sleeve had been installed around the joint. Anomalies concerning the culvert's line and grade were also noted at four locations. The presence of the polyethylene sleeve suggest possible problems during construction. We recommend that the damaged joint be repaired or replaced.

Refer to Figure Nos. 7-1 through 7-3 for detailed accounts of the individual surveys and to Plate Nos. 7-1 through 7-3 for locations of the individual sections.

2.8 SITE NO. 8

Site No. 8 was located at the I-94/Merriman and I-94/Middlebelt interchanges in Romulus, Michigan. The MDOT designation for Site No. 8 was 82022-25576A. Three sections of storm culverts were surveyed within this site on August 31, 1994. For identification purposes, the individual sections will be identified as Section Nos. 8-1 through 8-3. The individual section designations will also be utilized on all supporting information.

Section 8-1 is a 73-foot long section of 15-inch diameter concrete culvert that crosses ramp G at Station 233+40 within the I-94/Merriman Road interchange. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the culvert is in good condition. No defects were noted during the survey.

Section 8-2 is a 76 foot long section of 18-inch diameter concrete culvert that crosses Ramp D at Station 236+40 within the I-94/Merriman Road interchange. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the culvert is in fair to good condition. However, several cracks, both transverse and longitudinal were observed during the survey. The cracking is most likely due to localized overstressing of the pipe and lack of proper bedding support for the pipe.

Section 8-3 is 50-foot long section of 15 inch diameter concrete culvert that crosses the turnaround from eastbound I-94 to westbound I-94 at Station 321+00. The culvert was cleaned of mud and debris prior to the CCTV survey. Based on the observations made during the survey, it appears that the culvert is in good condition other than a minor crack that was observed between 24 and 35 feet from access Point "A" (Station 321+30). Some damage was also noted at the end sections.

Refer to Figure Nos. 8-1 through 8-3 for detailed accounts of the individual surveys and to Plate Nos. 8-1 through 8-3 for locations of the individual sections.

3.0 REMEDIAL MEASURES

In general, there were four basic types of defects noted during the CCTV survey of the selected locations within contract No. 1. The type of defects noted were cracking of the reinforced concrete pipe, deflection of the polyethylene and corrugated metal pipes, offsets between pipe sections and the puncture of corrugated metal pipe. In general, as noted in Section 2 of this report, the lines with defects are functioning substantially as designed. However, as noted in Section 2, there were two areas in which the conditions were more severe. Within these areas, the sewers are not functioning as designed and should be repaired. These areas are the broken pipe at test section No. 6-1 and the blocked line at test section No. 1-2.

With respect to the general conditions observed on balance of the project, there are a number of alternatives remedial measures which may be considered relative to the conditions observed. These alternative measures are:

1. Monitoring
2. Relining
3. Remove and Replace, including Replace and Abandonment

In the following paragraphs, we will briefly review each of the alternatives.

Monitoring - The present study documents the condition of the various pipes on the date they were surveyed. The study does not, however, provide any information relative to the rate at which the observed defects are developing. In some cases, the observed defects may have occurred during construction and have had little if any change with time. In other cases, the observed defect may be progressing as a creep phenomenon or as a dynamic response to traffic loads. To provide additional information relative to the development of the observed distress in the subject lines, consideration could be given to reexamining the distressed lines at

creative use of horizontal boring would allow pipe replacement without interruption to the overlying pavement.

some time in the future. Consideration could also be given to developing an adjustable Mandrel for use with the polyethylene pipe locations. Such an adjustable Mandrel could be fabricated similar to the Hurco Mandrel utilized by Inland Waters where the size is set by machined end plates. In addition to the 5 percent of nominal diameter utilized in the MDOT standard, plates could be fabricated for 7 percent, 10 percent, 12 percent and 15 percent of the nominal inside diameter of the pipe. We would recommend a maximum deflection of 15 percent based on a review of the Transport and Road Research Laboratory's Supplemental Report 534 on the Load Carrying Capacity of Cracked Rigid Pipe, a preliminary study which indicates that above 15 percent the pipe reaches a failure condition.

Relining - The use of a relining strategy provides an opportunity to enhance the strength of an existing sewer line, as well as method for sealing the existing pipe. There are proprietary systems available which may be utilized. One of the oldest systems is the inversion liner system in which a resin soaked liner is expanded into the pipe to be repaired. The resins are then polymerized and cured through the application of heat. The use of a propriety liner system, however, does result in the reduction of the cross sectional area. The available literature suggests that the smoothness of the liner offsets the effect of this reduction in area with a corresponding reduction in the frictional resistance of the liner. In some cases, the literature indicates that the carrying capacity of the pipe with a liner may exceed that of the unrestricted pipe. However, when a liner is utilized in a polyethylene pipe, this reduction in frictional resistance may not be as dramatic as that observed when relining a concrete pipe. If a reduction in cross section is not acceptable, it may be necessary to consider replacement rather than relining.

Remove and Replacement - The removal and replacement of an existing sewer is the last option to be considered. This process requires an excavation along the existing sewer, removal of the sewer and the installation of a replacement. This method affords the greatest flexibility in construction but requires the replacement of the overlying pavement. Alternatively, the

4.0 OBSERVATIONS

Based upon the data developed in this study, we offer the following observations and opinions relative to the pipe materials utilized.

4.1 POLYETHYLENE PIPE

As noted in the Executive Summary, 52 percent of the polyethylene pipe did not pass the MDOT Mandrel Test. In addition, there were 32 localized dips observed. Polyethylene pipe is a thin walled flexible pipe. As such, this type of pipe depends on the soil around the pipe to maintain its shape. Based upon our observations, we would suggest that both the installation procedures and the design parameters for flexible pipe be reviewed and modified as required.

Many of the installations mandreled, the mandrel stopped within a few feet of structures. This suggests that the pipe is negatively impacted by the wider excavation at the structure locations. Within this reach, the pipe is generally not within a trench, rather it is approaching a positively projecting condition. We would suggest that the installation procedures be reviewed with respect to reaches immediately adjacent to structures. We would also suggest that contractors may not be aware of how sensitive a flexible pipe is to the installation procedures utilized.

4.2 REINFORCED CONCRETE PIPE

In general, this type of pipe appears to be performing well. The presence of the broken pipe at site 6-1 suggests that installation and post installation procedures be reviewed. It is probable that this section of pipe was crushed as construction equipment utilized the road prior to the installation of the pavement. We would suggest that where heavy construction equipment is utilized, the underlying pipe sections be checked for damage prior to paving. Alternatively, if heavy construction equipment must utilize portions of the roadway, the depth of cover over the pipe could be increased on a temporary basis. We would also suggest that the depth of cover over segment 8-2 be reviewed as the cracking in this section is somewhat greater than anticipated and the cracked section appears to be beneath the ramp pavement.

4.3 CORRUGATED METAL

In general, there were only a few pipe sections which utilized this pipe in contract No. 1. This type of pipe is more flexible than concrete pipe. This type of pipe, like the polyethylene pipe depends on the interaction with surrounding soil to carry the imposed load. In some cases, this type of pipe has been damaged or deformed during installation. We would suggest that the installation procedures for this type of pipe be reviewed and modified.

APPENDIX A

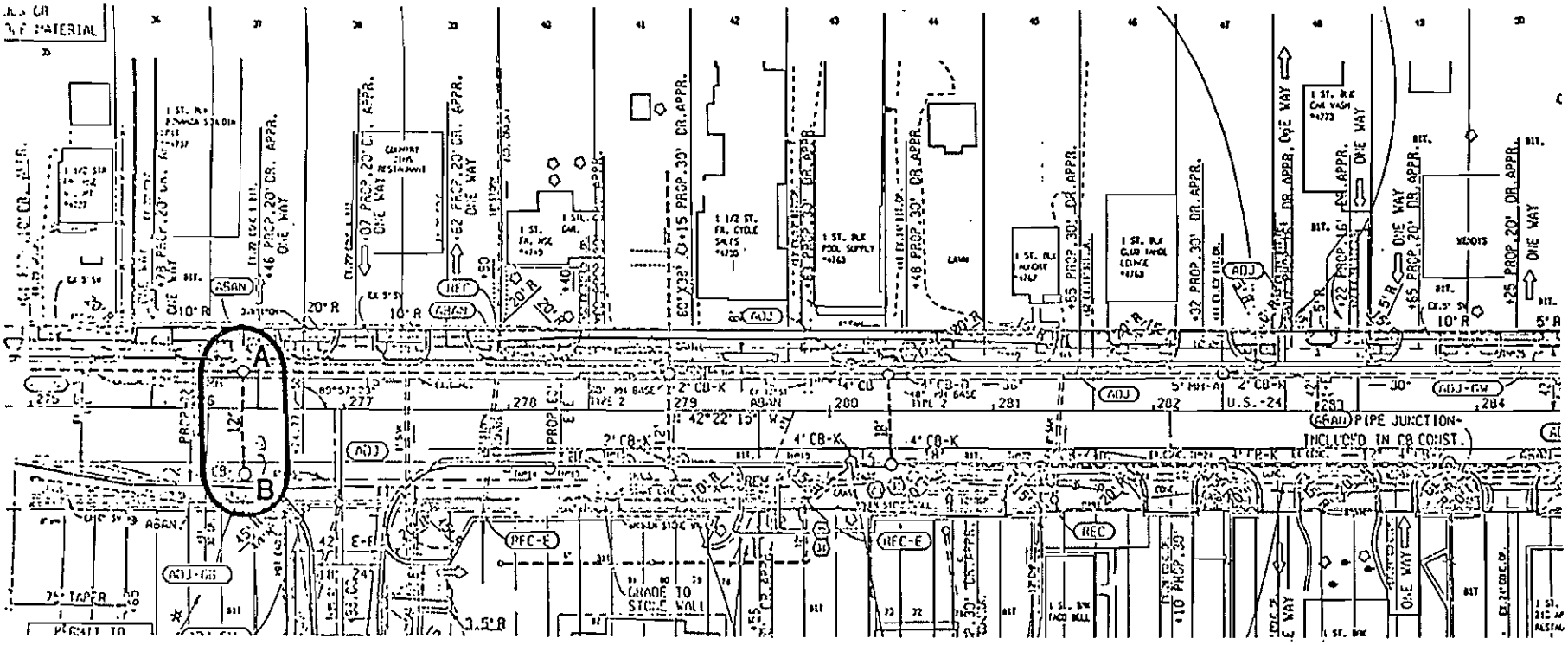
MDOT CONTRACT NO. 1

PLATE 0-1

DATA SUMMARY

SECTION	SIZE DIA. IN.	LENGTH FEET	CONC.	POLY	CMP	MANDREL TEST ON POLY. PIPE PASS FT.	TOTAL FT.
1-1	12	57	57				
1-2	18	56	56				
1-3	12	50	50				
1-4	15	97	97				
2-1	18	167	167				
2-2	12	99	99				
2-3	12	93	93				
3-1	15	306		306		60	306
3-2	12	65		65		65	65
3-3	12	67		67		67	67
3-4	12	72		72		72	72
3-5	12	69		69		69	69
3-6	12	76	76				
4-1	12	52		52	NO ACCESS		
4-2	12	53		53		53	53
4-3	18	153		153		153	153
4-4	12	53		53		53	53
4-5	12	55		55		15	55
4-6	12	65		65	NO ACCESS		
4-7	12	51		51	NO ACCESS		
4-8	24	262		262	NO ACCESS-NOT CLEANED		
4-9	24	250		250	NO ACCESS		
5-1	24	235		235	MANDREL TOO BIG FOR MANHOLE		
5-2	12	80	80				
5-3	12	68	68				
5-4	12	170		170		38	170
5-5	18	253		253		63	253
6-1	12	84	84				
6-2	12	51		51		8	51
6-3	15	161	161				
6-4	12	53	53				
6-5	12	52		52		52	52
6-6	15	247		247		10	247
6-7	12	41	41				
6-8	12	38	38				
6-9	12	38		38		25	38
6-10	12	50		50		44	50
7-1	12	195			195		
7-2	12	212	93		119		
7-3	12	151			151		
8-1	15	73	73				
8-2	18	76	76				
8-3	15	50	50				
TOTAL		4646	1512	2669	465	847	1754

PERCENT OF POLYETHYLENE PIPE FAILING MANDREL TEST = 51.71%



NORTH

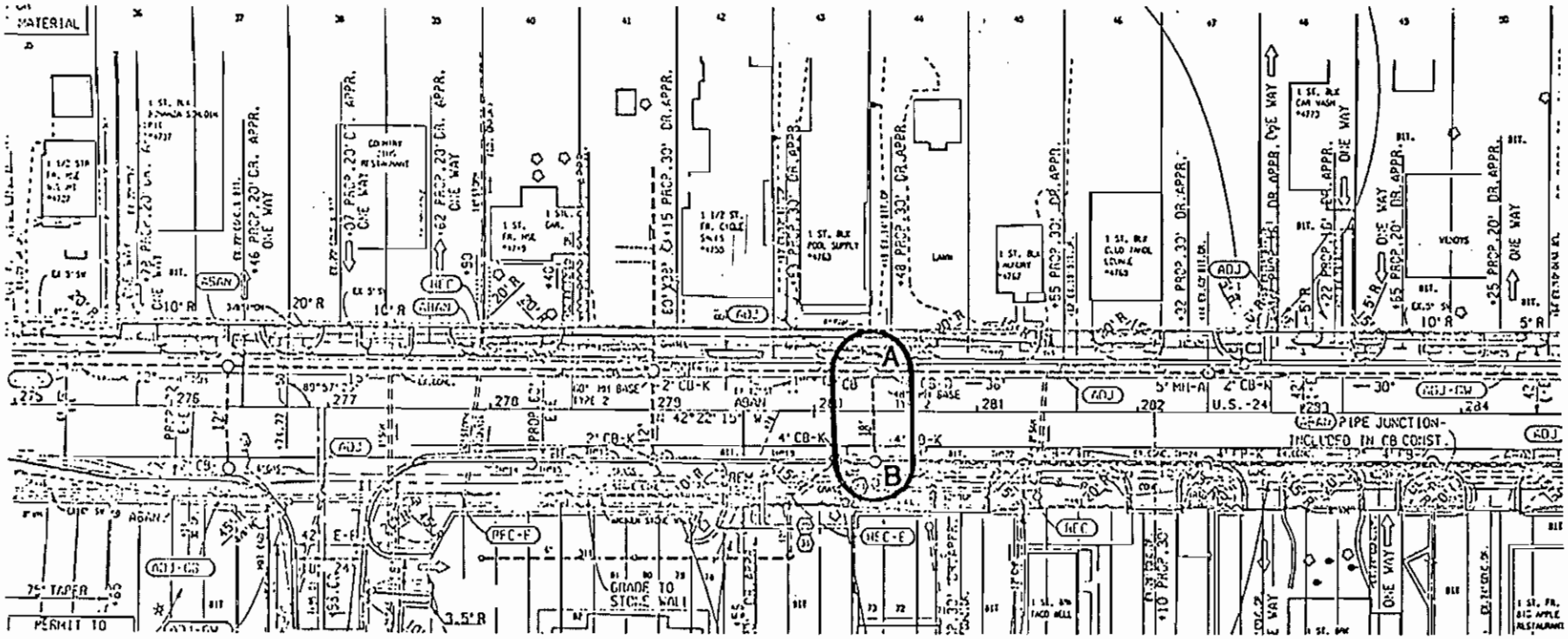
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 1: US-24 HATCHERY RD NORTH TO M-15

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	1 1
SCALE: NONE	CHECKED BY: HRP	SHEET 2 OF 4	

#4422
#09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 1: US-24 HATCHERY RD NORTH TO M-15

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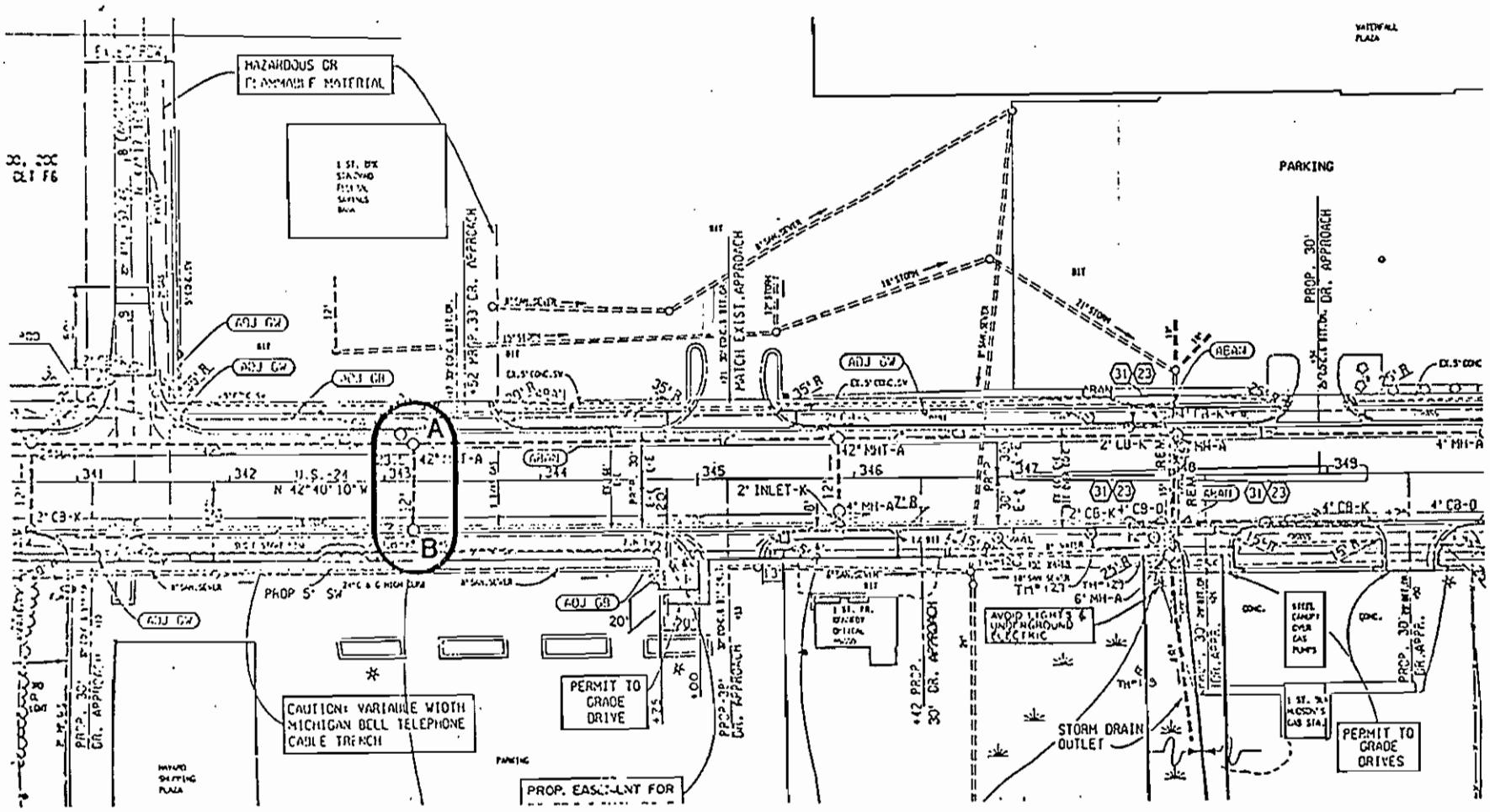

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 1: US-24 HATCHERY RD NORTH TO M-15

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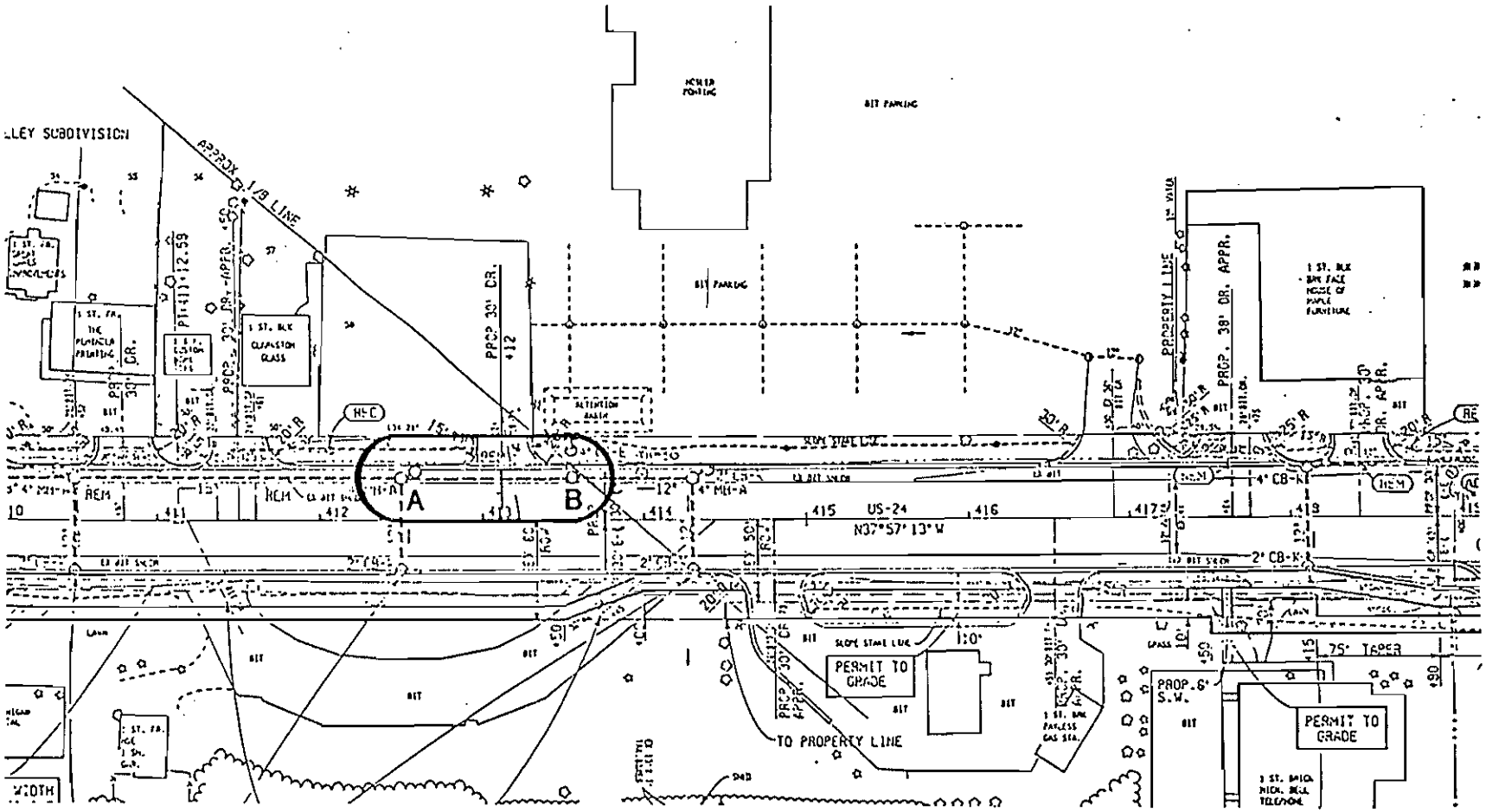

NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 1: US-24 HATCHERY RD NORTH TO M-15

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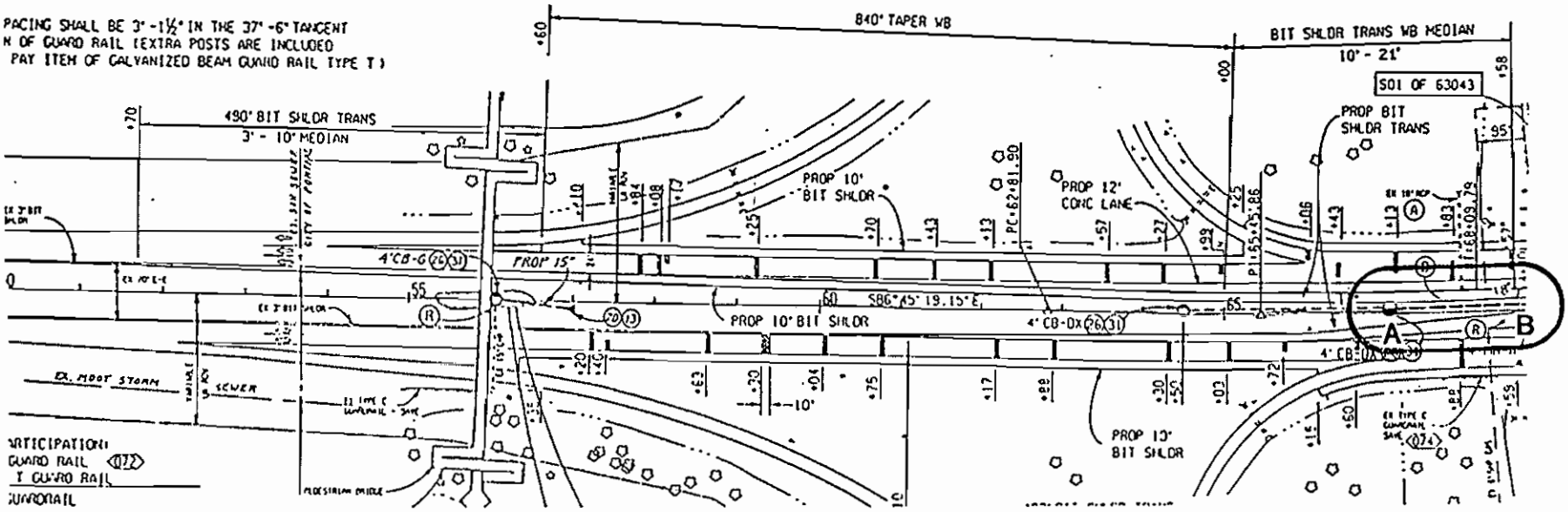

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 2: M-59 WEST OF I-75 TO WEST OF M-150

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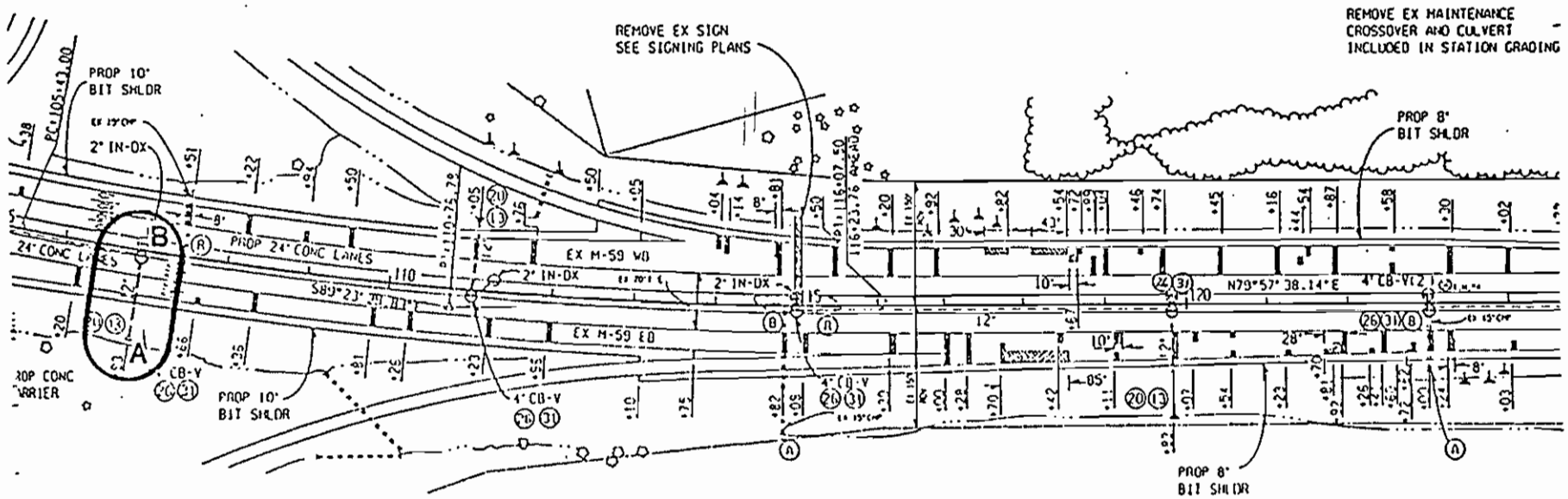
•09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 2: M-59 WEST OF I-75 TO WEST OF M-150

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Detroit, Michigan

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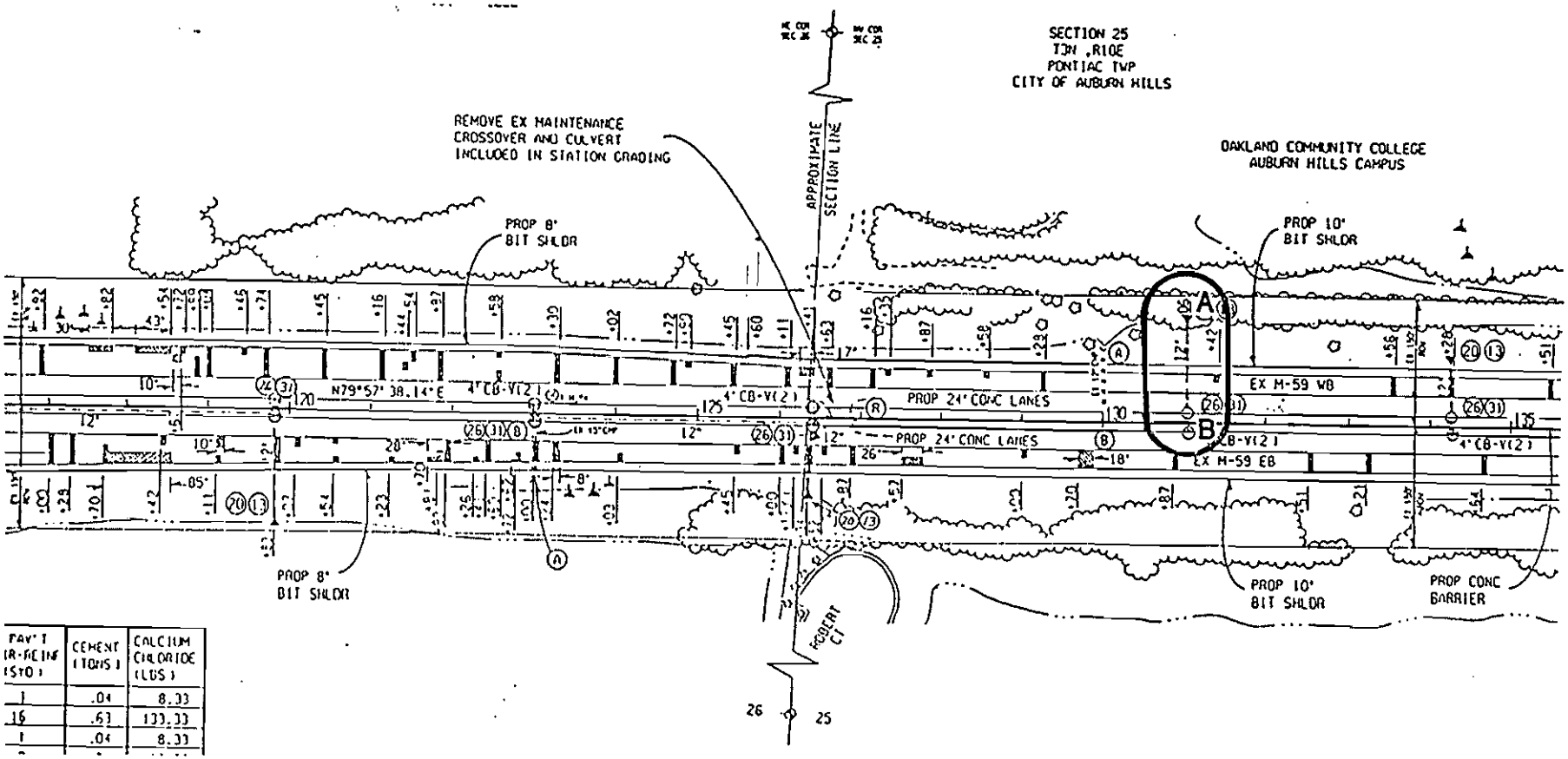

PAV'T IR-REINF (STD)	CEMENT (TONS)	CALCIUM CHLORIDE (LBS)
1	.04	8.33
16	.63	133.33
1	.04	8.33

NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 2: M-59 WEST OF 1-75 TO WEST OF M-150

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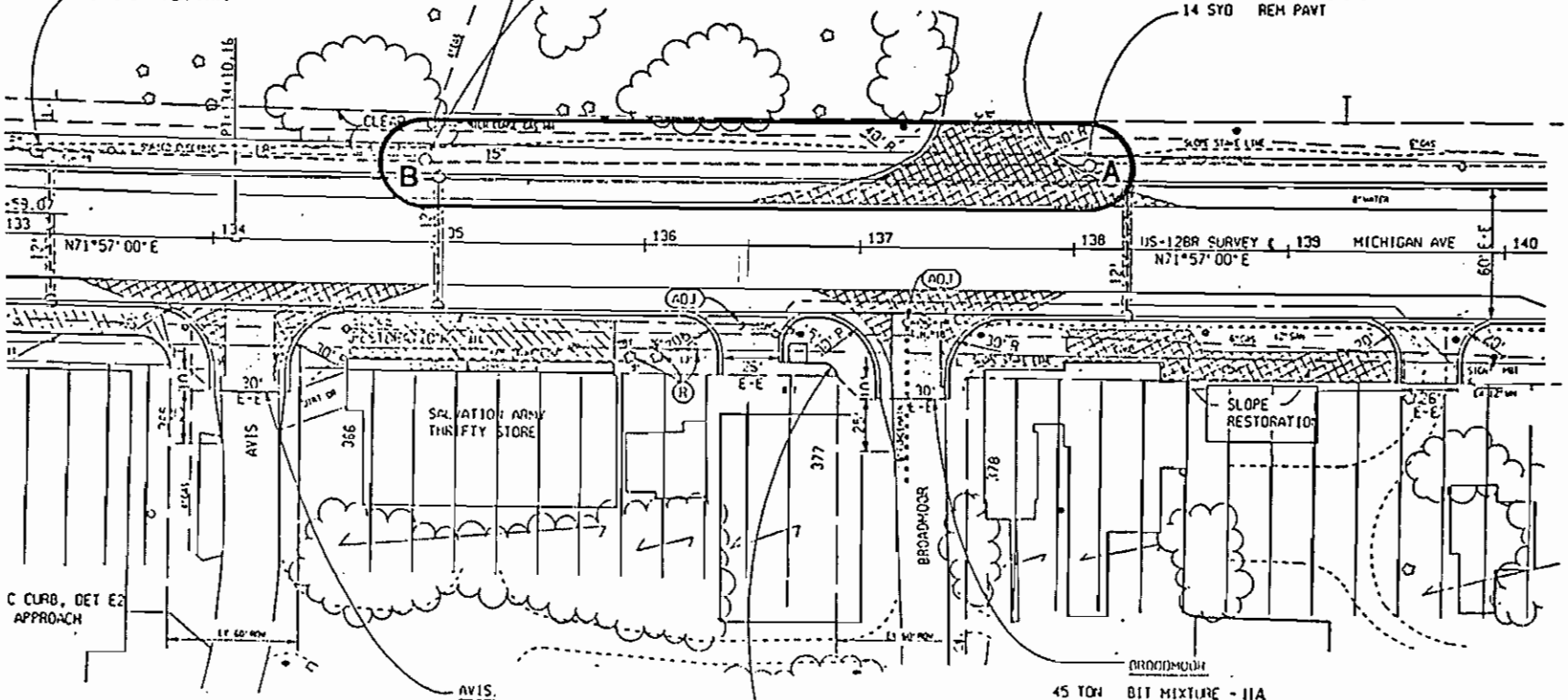
•4422
•09-13-94

16 LFT CLASS C76-II SEW, 12", TR DET B
64 LFT CLASS C76-II SEW, 12", TR DET B
7 TON HAND PATCHING
14 SYD REM PAVT

64 LFT CLASS C76-II SEW, 12", TR DET B
7 TON HAND PATCHING
14 SYD REM PAVT

64 LFT CLASS C76-II SEW, 12", TR DET B
210 LFT CLASS C76-II SEW, 15", TR DET A
94 LFT CLASS C76-II SEW, 15", TR DET B
7 TON HAND PATCHING
14 SYD REM PAVT



63 TON BIT MIXTURE - IIA
31 TON BIT APPROACH
12 TON COLD-MILLING BIT SURFACE
43 SYD REM PAVT
114 LFT CONC CURB AND GUTTER, DET B2

25 LFT CONC CURB, DET E4
8 TON BIT APPROACH

45 TON BIT MIXTURE - IIA
30 TON BIT APPROACH
12 TON COLD-MILLING BIT SURFACE
40 SYD REM PAVT
114 LFT CONC CURB AND GUTTER, DET B2

NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 3: US-12 HARRIS ROAD EAST TO WASHTENAW-WAYNE COUNTY LINE

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

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34-4422-00	SHB	09-13-94	3 1
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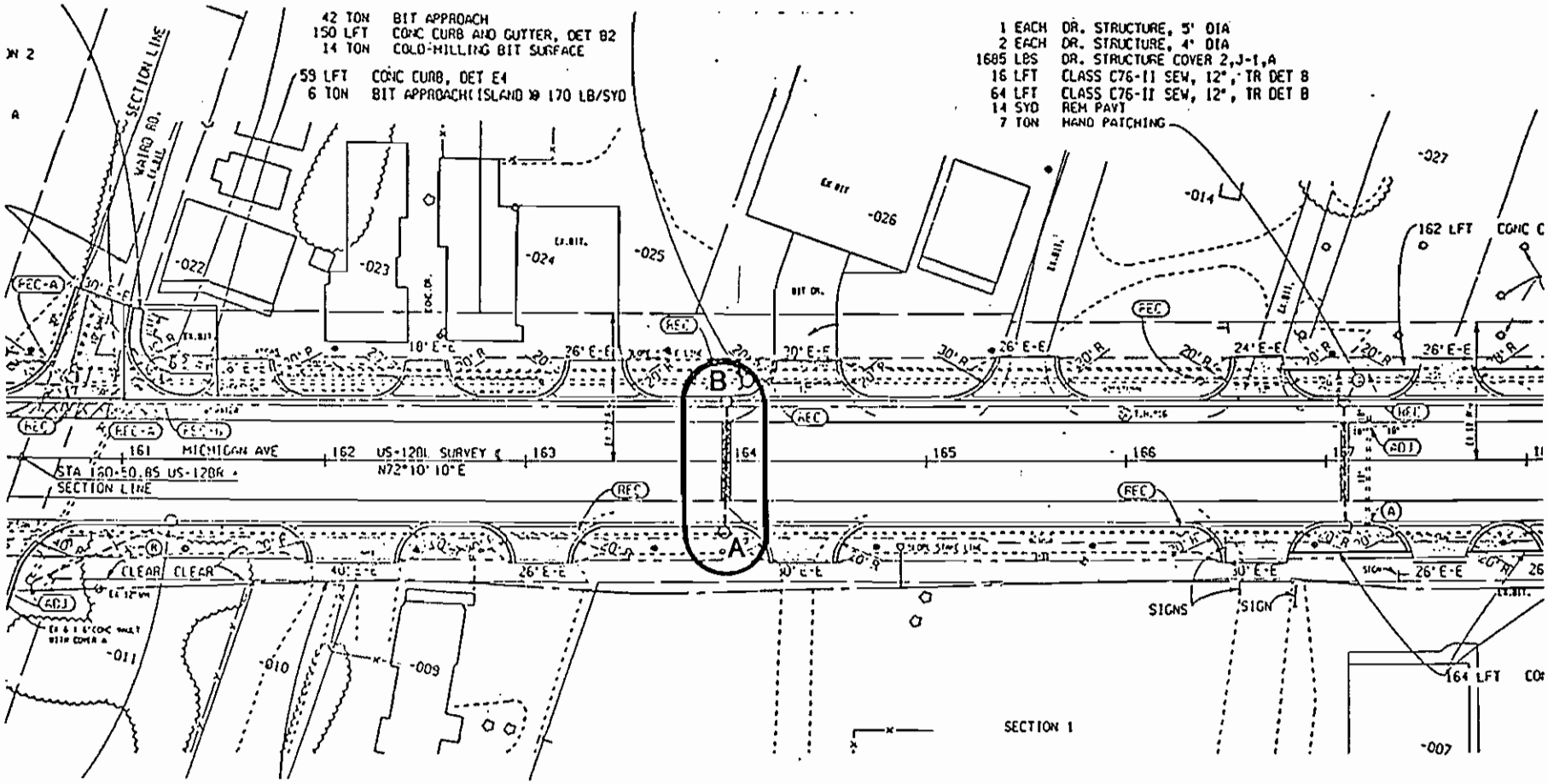
•4422
•09-13-94



NORTH

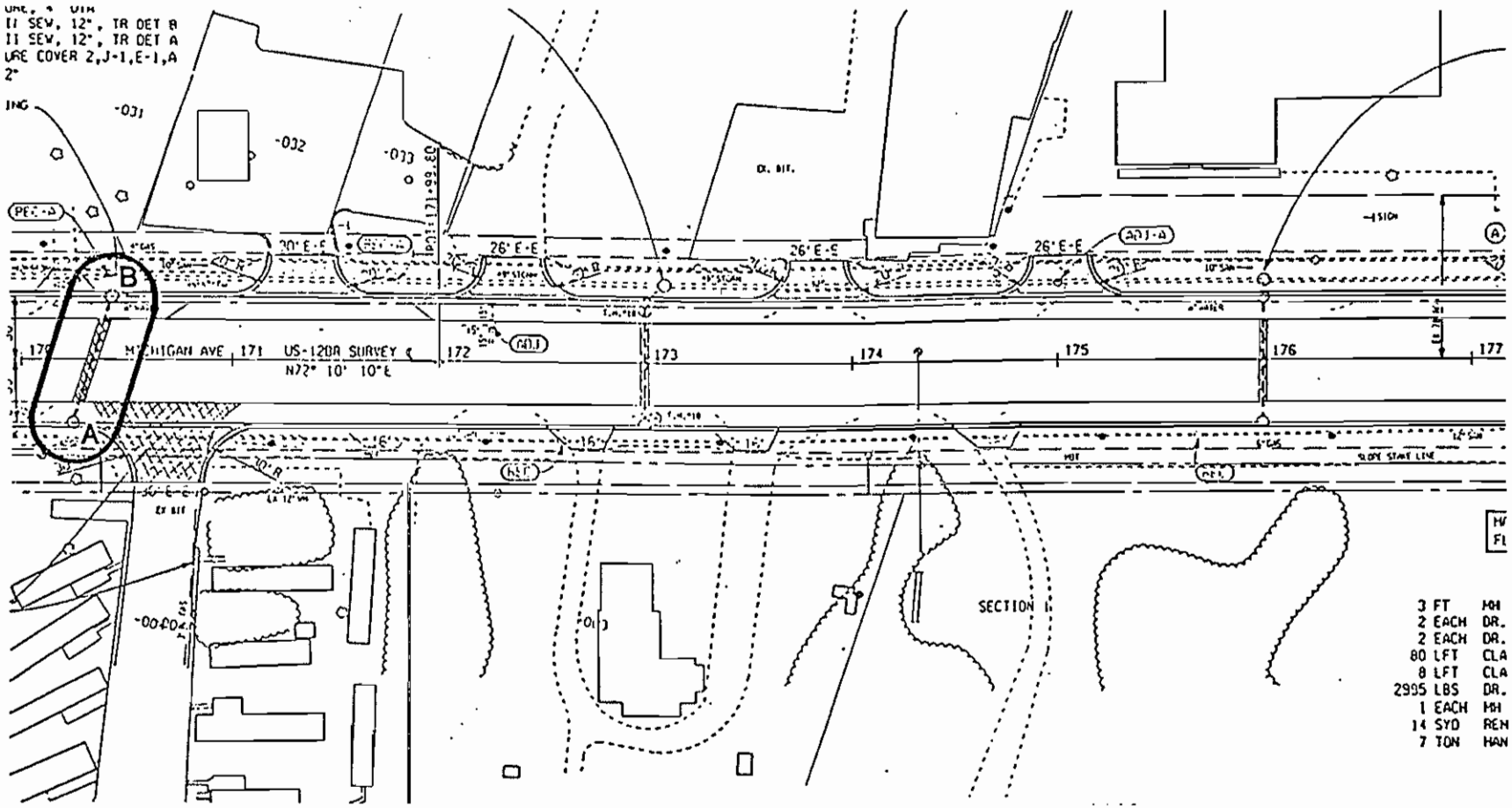
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 3: US-12 HARRIS ROAD EAST TO WASHTENAW-WAYNE COUNTY LINE

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	3 2
SCALE: NONE	CHECKED BY: HRP	SHEET 3 OF 6	

•4422
•09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 3: US-12 HARRIS ROAD EAST TO WASHTENAW-WAYNE COUNTY LINE

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

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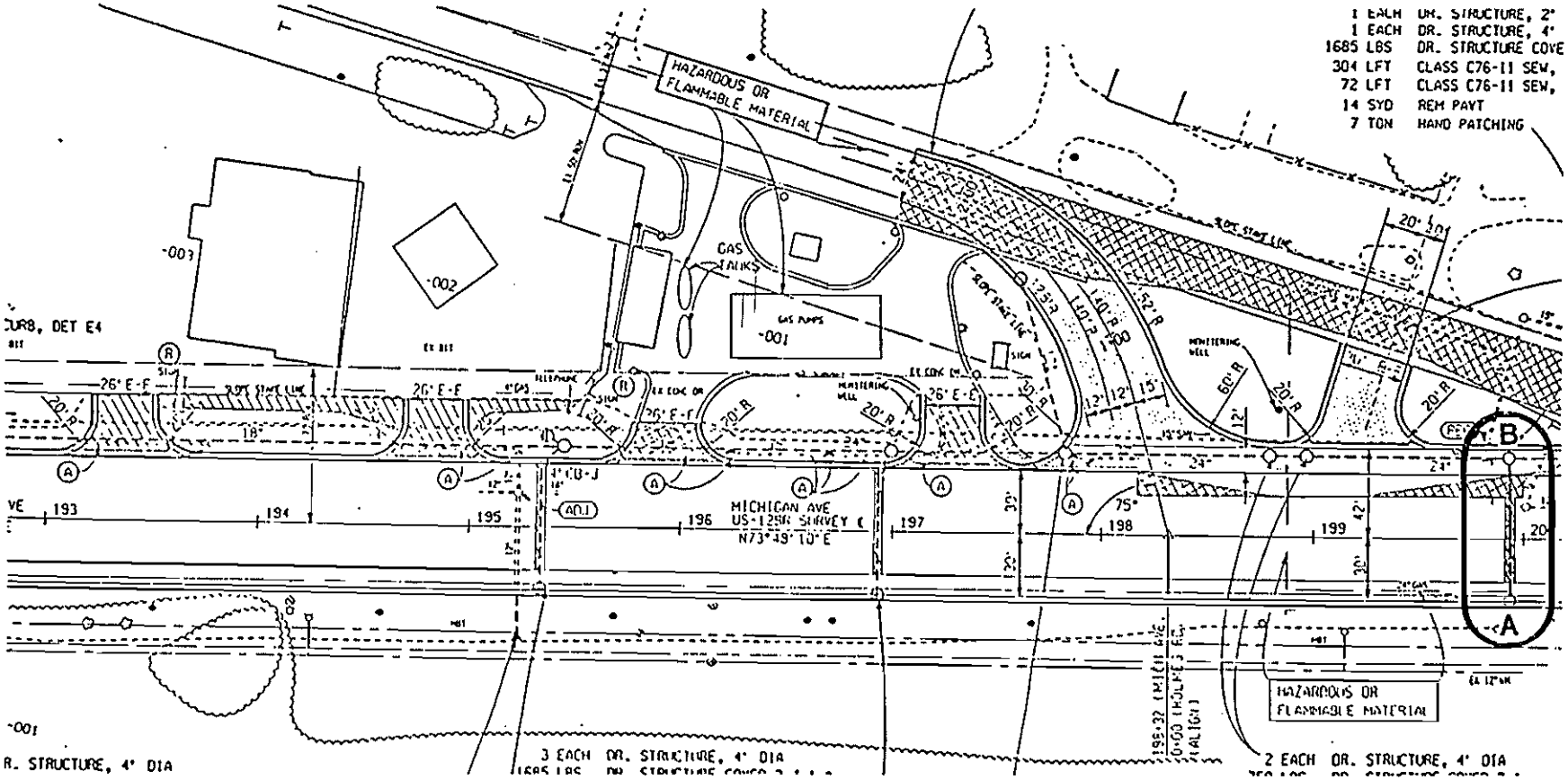
34-4422-00	SHB	09-13-94	3 3
SCALE: NONE	CHECKED BY: HRP	SHEET 6 OF 6	

#4422
#09-13-94



NORTH

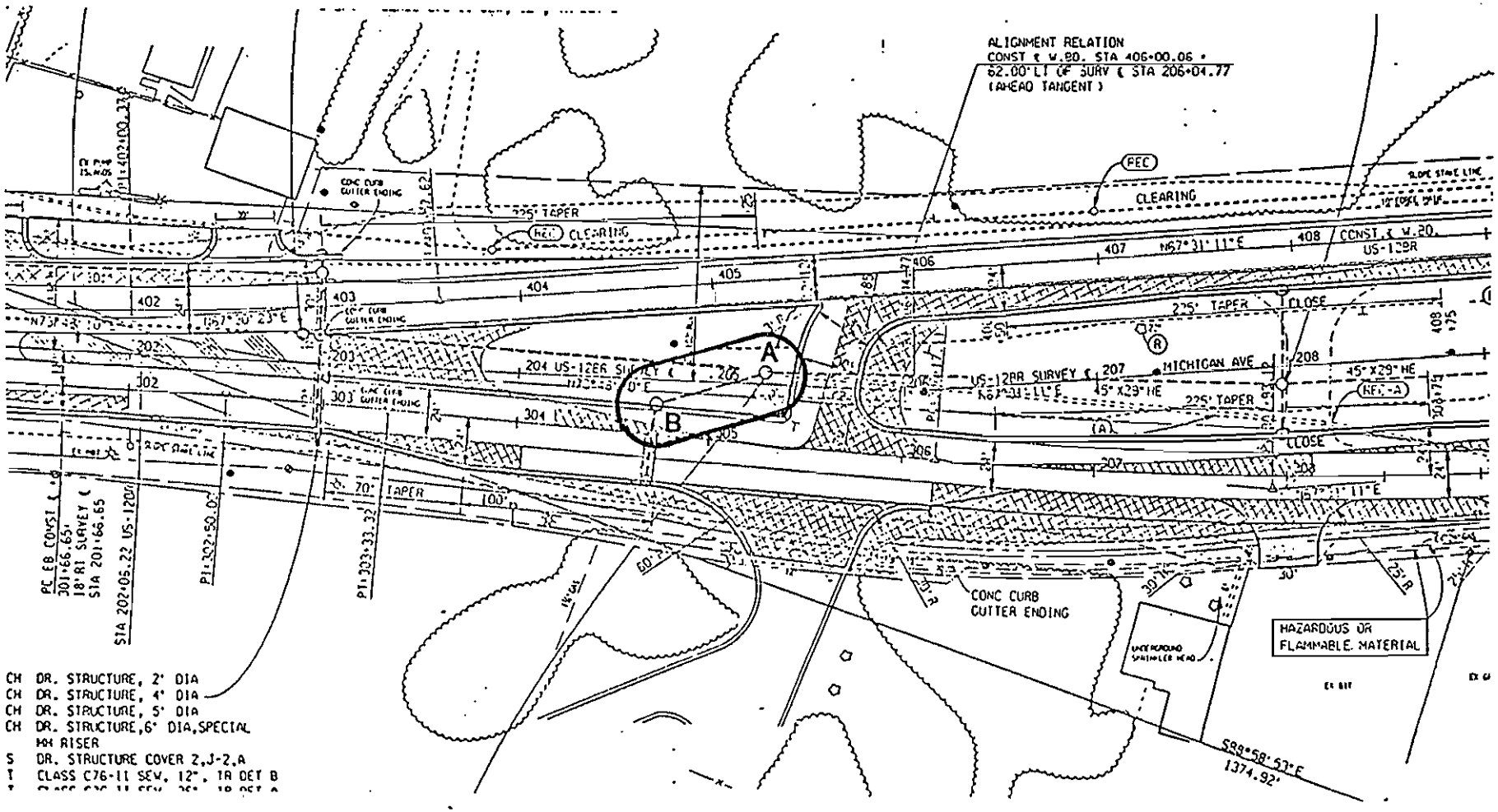
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 3: US-12 HARRIS ROAD EAST TO WASHTENAW-WAYNE COUNTY LINE

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	3 4
SCALE: NONE	CHECKED BY: HRP	SHEET 2 OF 6	

•4422
•09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 3: US-12 HARRIS ROAD EAST TO WASHTENAW-WAYNE COUNTY LINE

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	3 5
SCALE: NONE	CHECKED BY: HRP	SHEET 4 OF 6	

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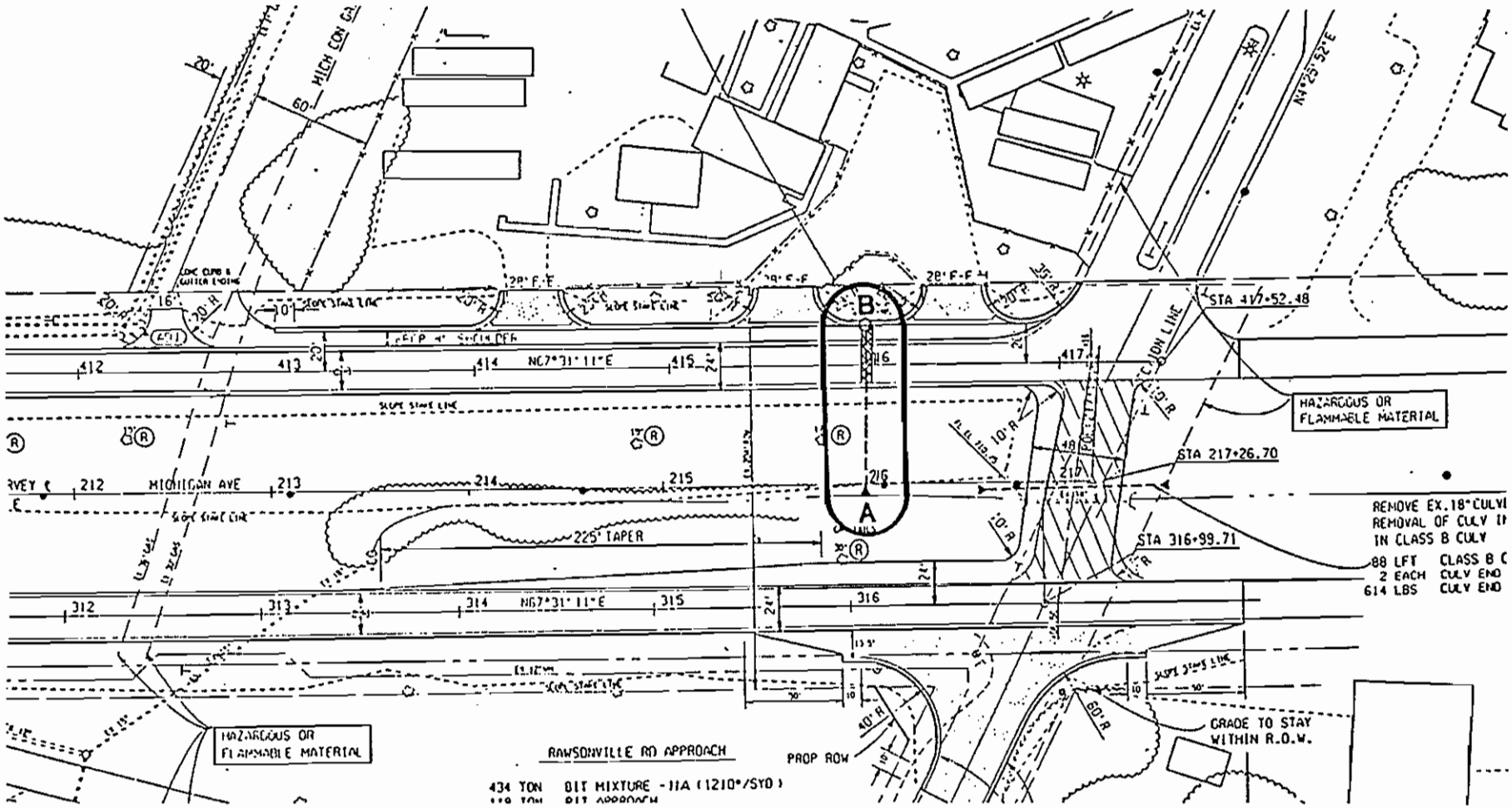
09-13-94



PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 3: US-12 HARRIS ROAD EAST TO WASHTENAW-WAYNE COUNTY LINE

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	3 6
SCALE: NONE	CHECKED BY: HRP	SHEET 1 OF 6	

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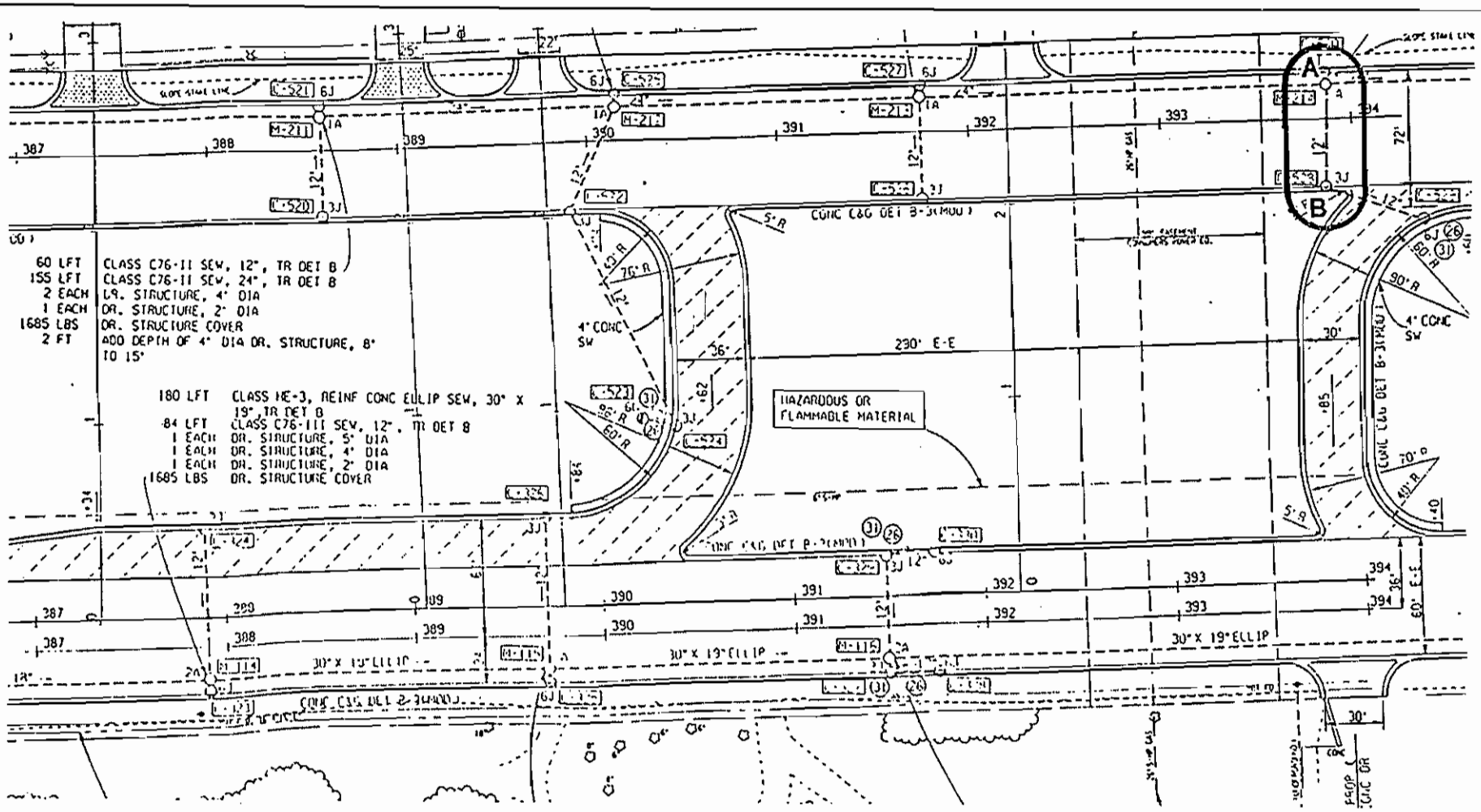
•09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 4: M-59 HAYES ROAD TO ROMEO PLANK ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

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34-4422-00	SHB	09-13-94	4 1
SCALE: NONE	CHECKED BY: HRP	SHEET 8 OF 8	

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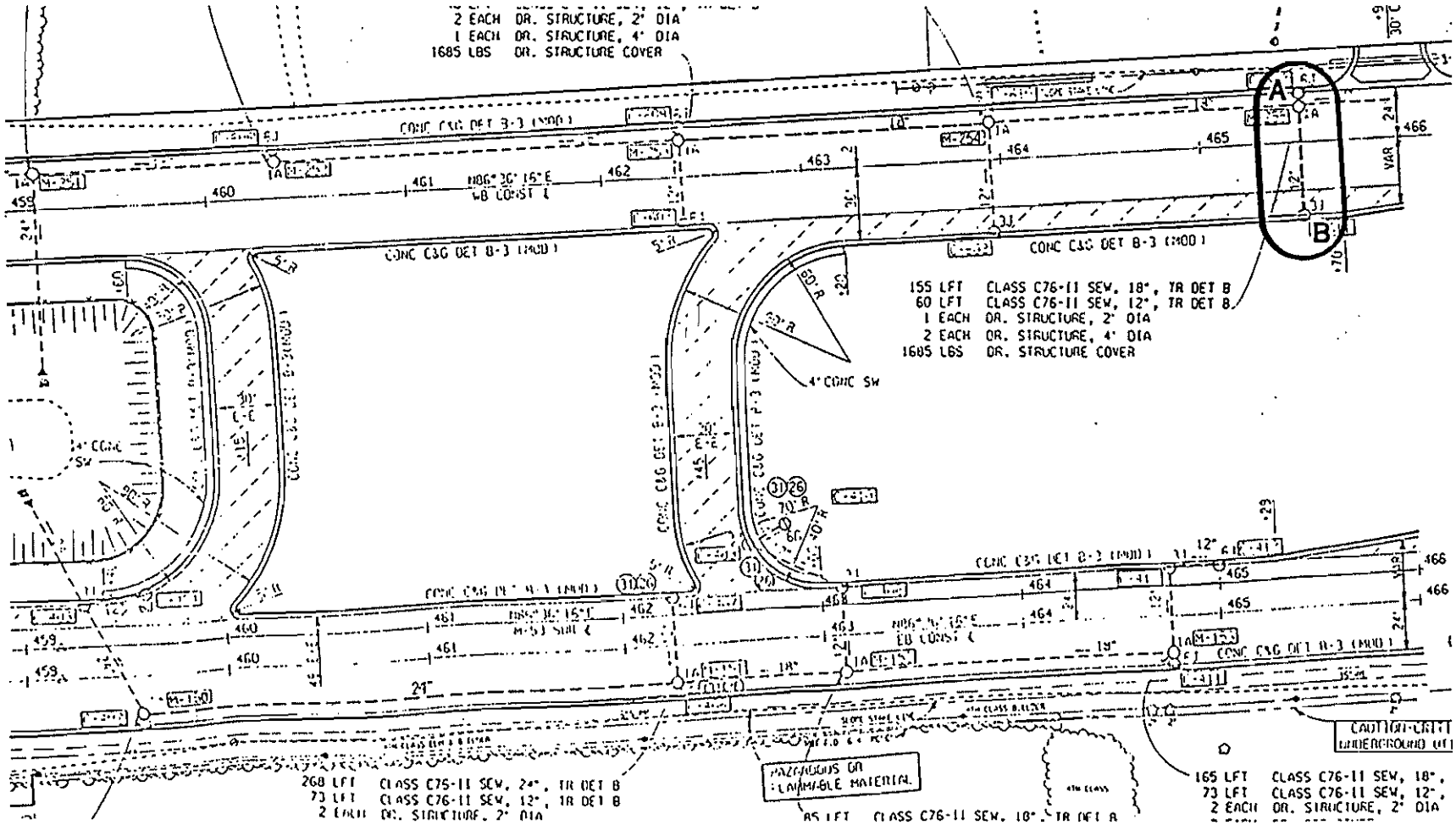
#09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 4: M-59 HAYES ROAD TO ROMEO PLANK ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	4 2
SCALE: NONE	CHECKED BY: HRP	SHEET 1 OF 8	

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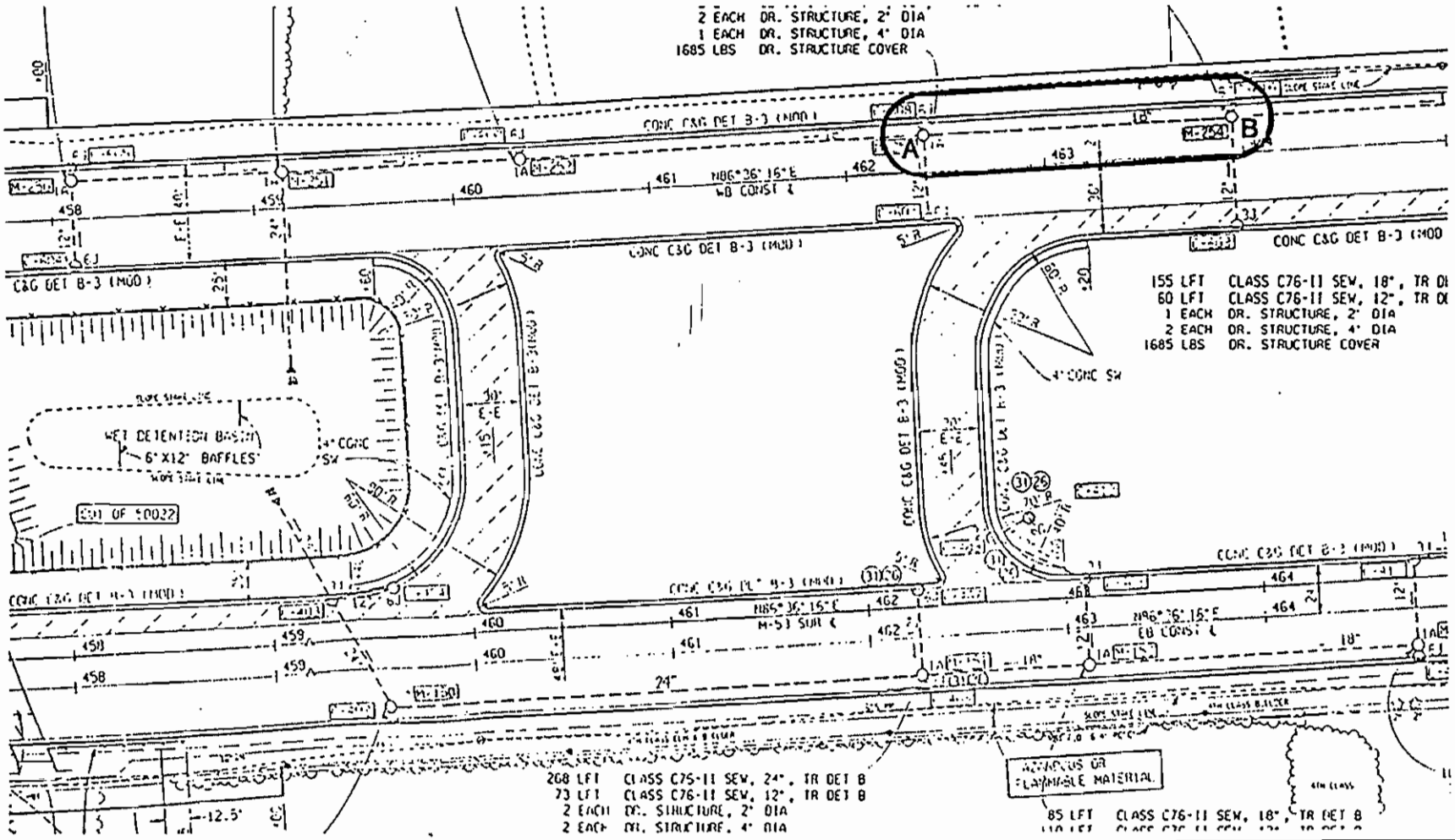
•09-13-94



PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 4: M-59 HAYES ROAD TO ROMEO PLANK ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

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SCALE: NONE	CHECKED BY: HRP	SHEET 7 OF 8	

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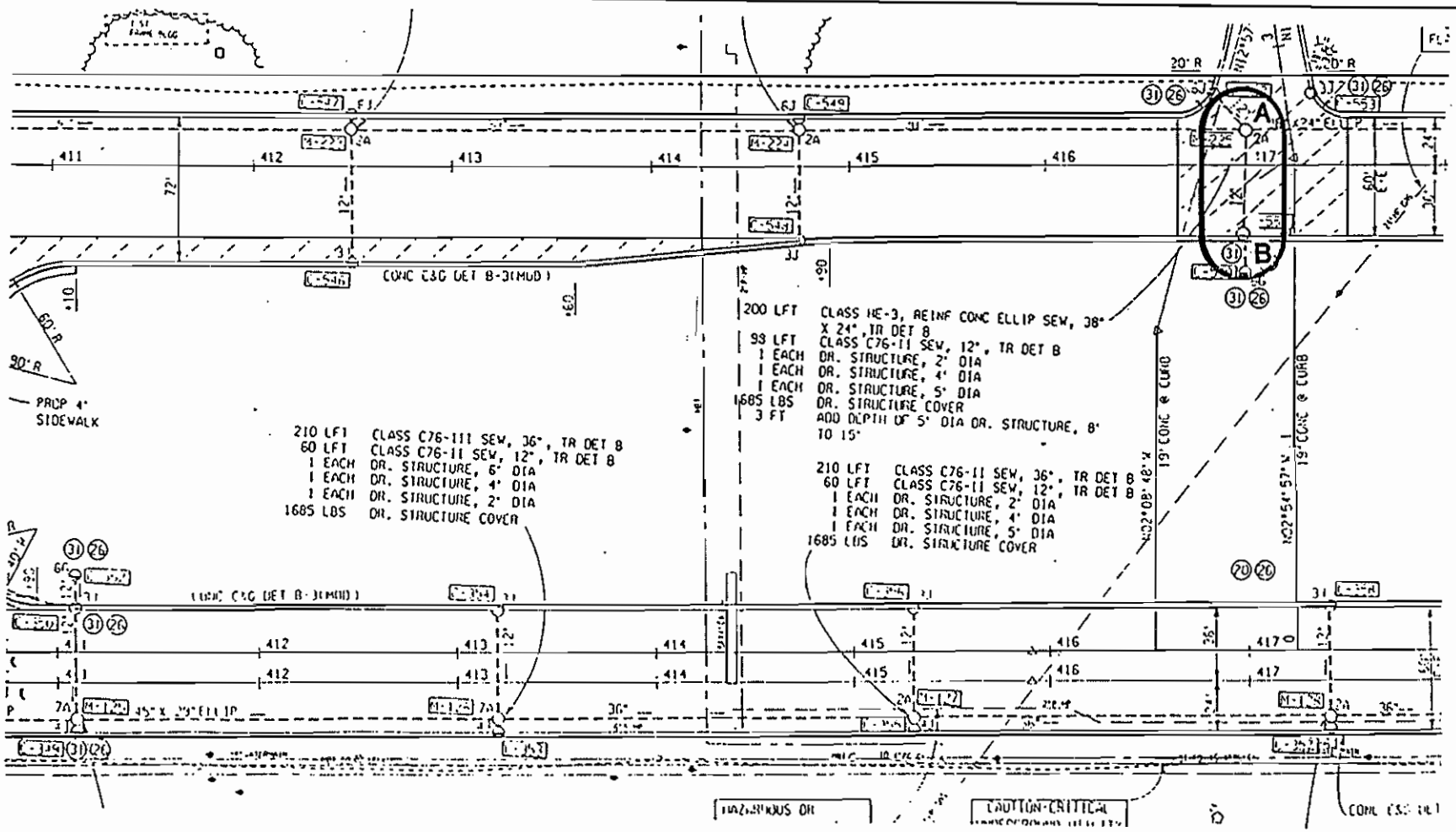
•09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 4: M-59 HAYES ROAD TO ROMEO PLANK ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

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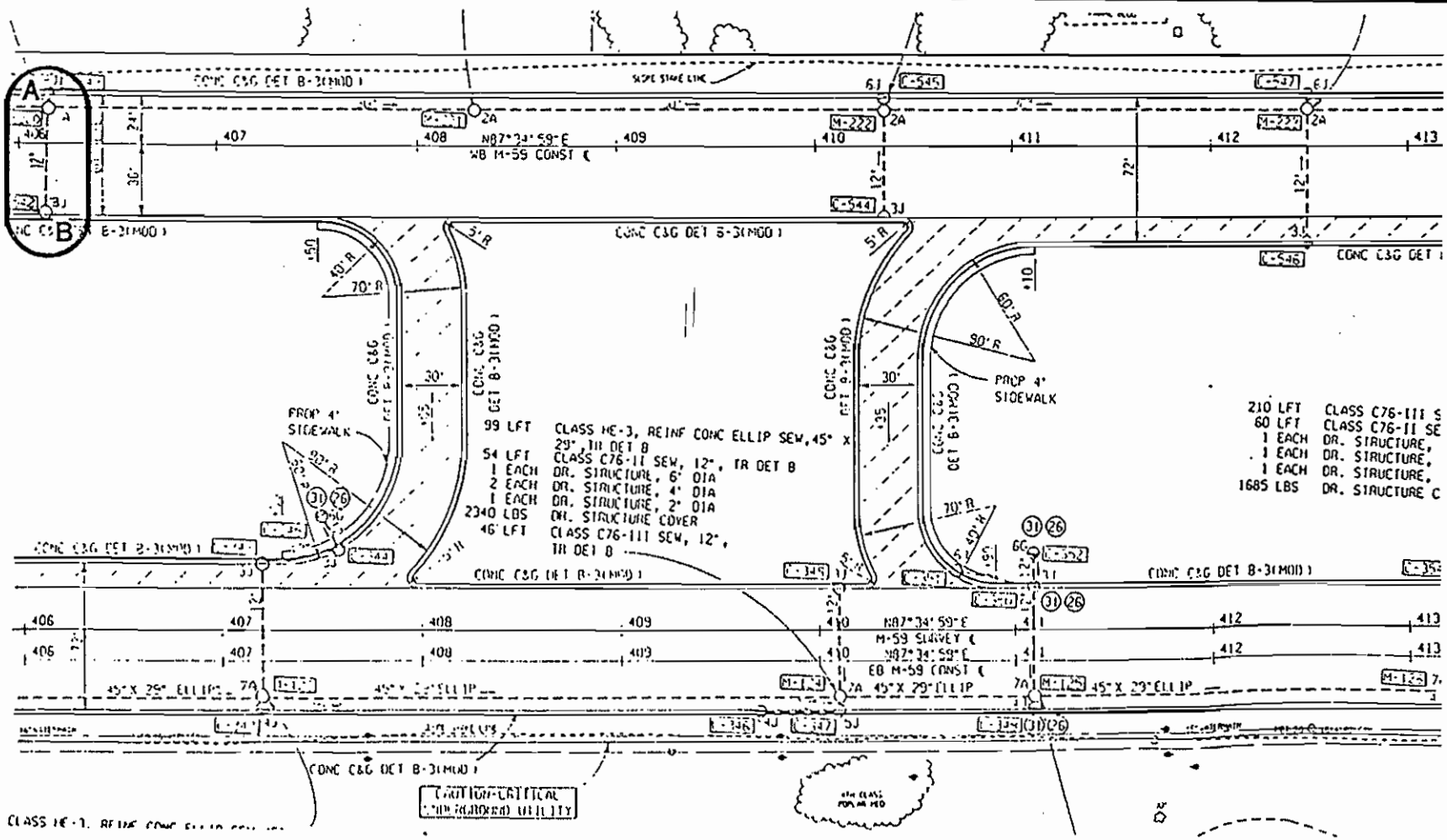
34-4422-00	SHB	09-13-94	4 4
SCALE: NONE	CHECKED BY: HRP	SHEET 6 OF 8	

•4422
•09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 4: M-59 HAYES ROAD TO ROMEO PLANK ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

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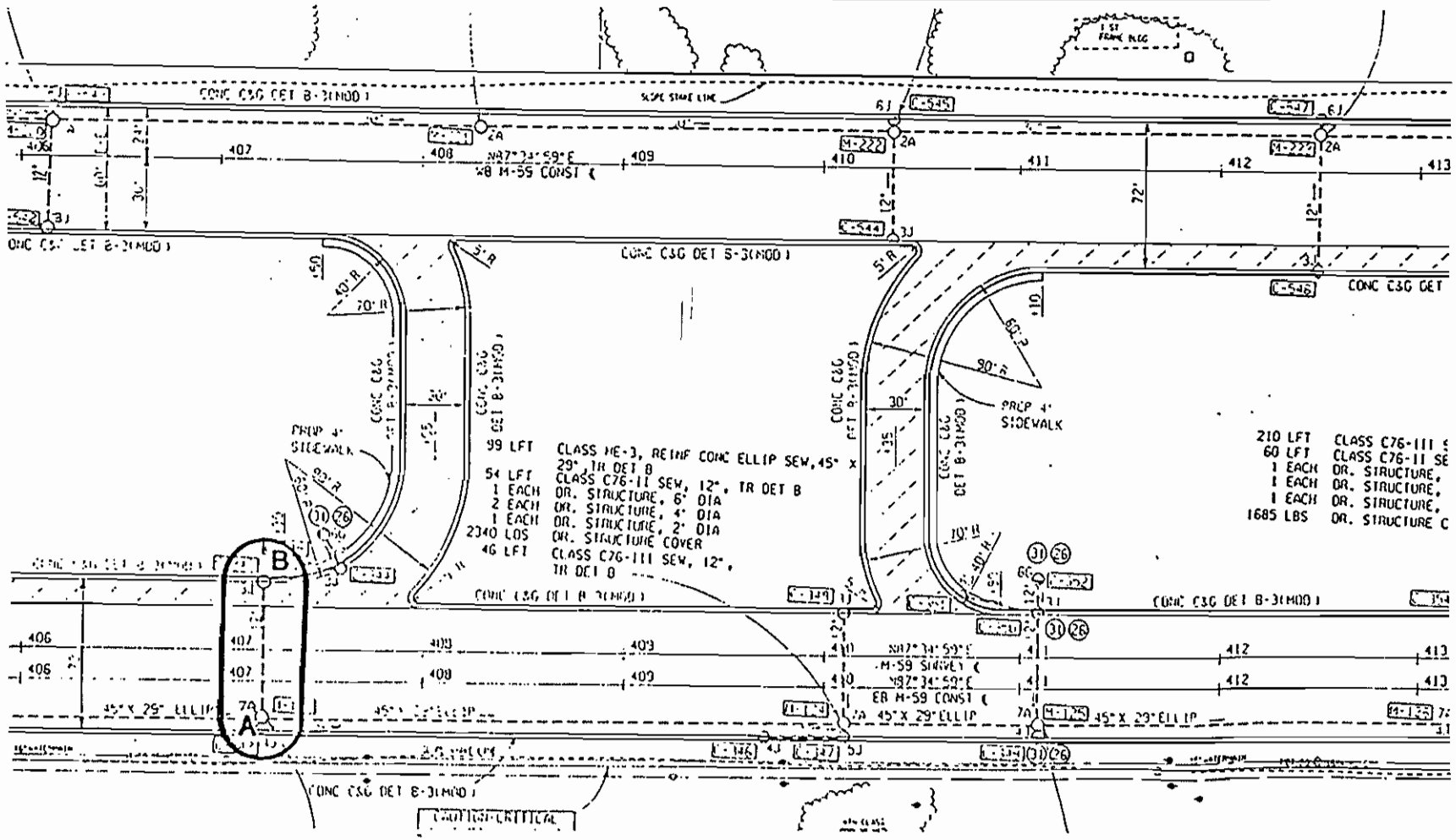
34-4422-00	SHB	09-13-94	4-5
SCALE: NONE	CHECKED BY: HRP	SHEET 5 OF 8	

#4422
09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 4: M-59 HAYES ROAD TO ROMEO PLANK ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

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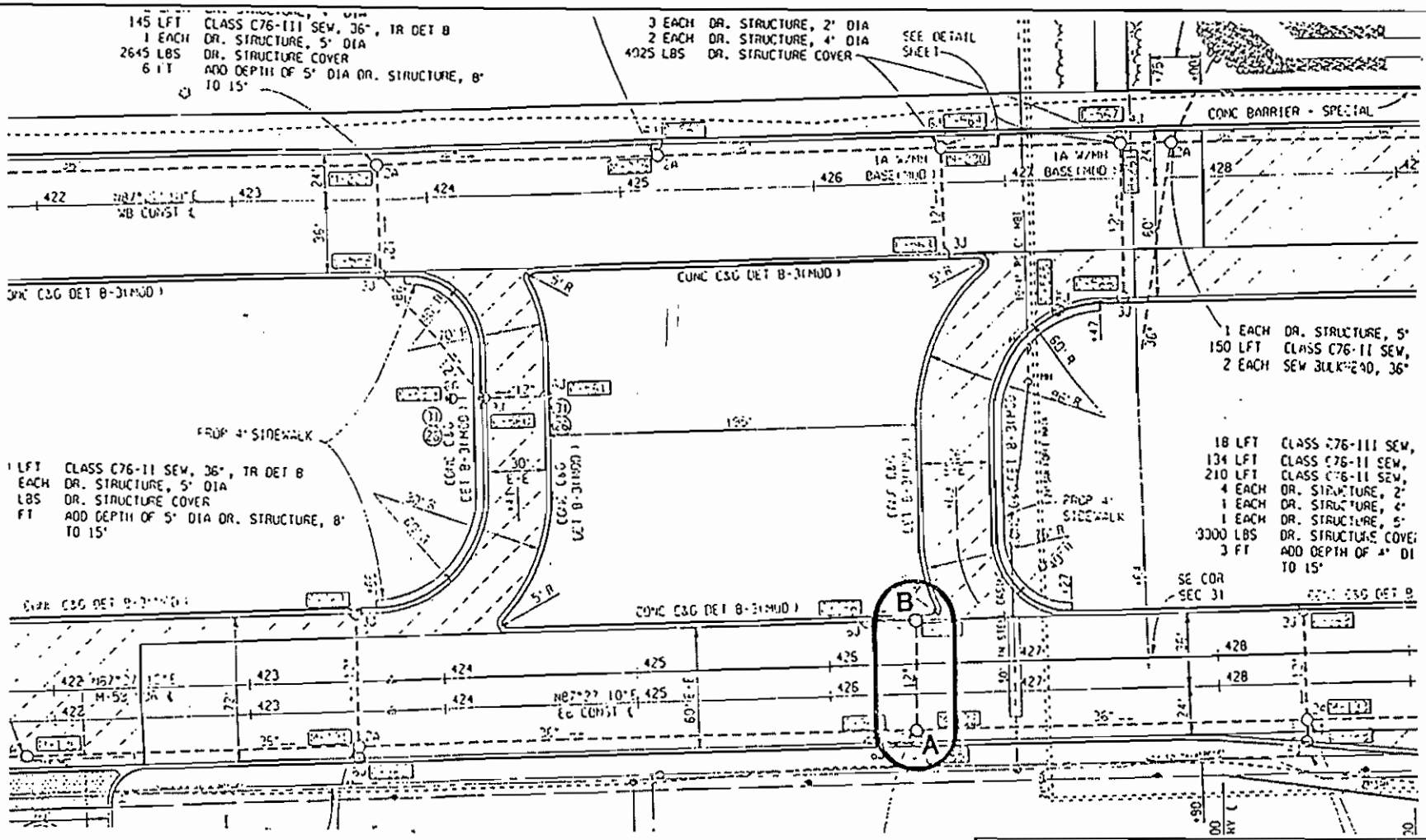
34-4422-00	SHB	09-13-94	4 — 6
SCALE: NONE	CHECKED BY: HRP	SHEET 3 OF 8	

#4422
#09-13-94



NORTH

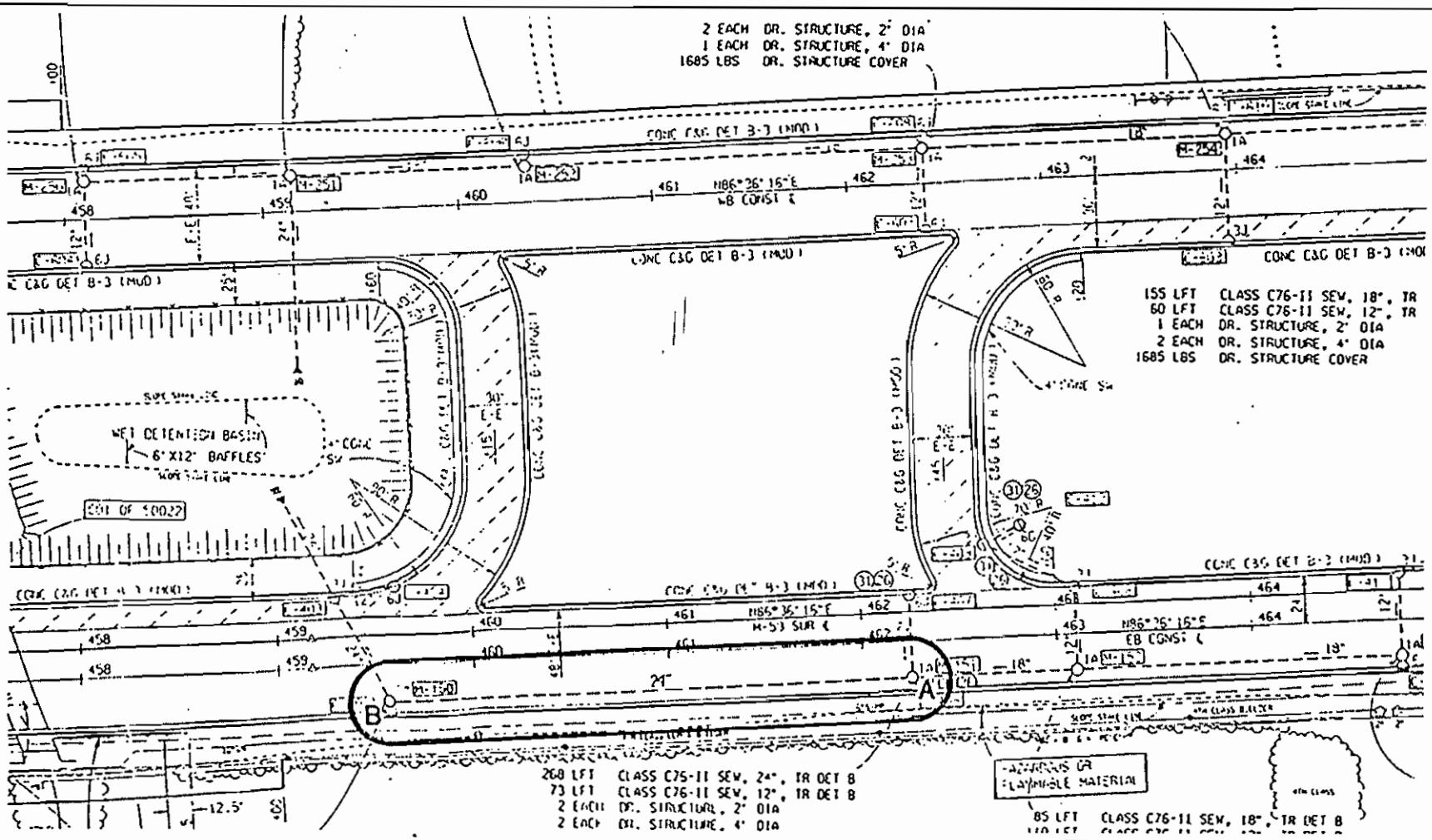
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 4: M-59 HAYES ROAD TO ROMEO PLANK ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	4 7
SCALE: NONE	CHECKED BY: HRP	SHEET 2 OF 8	

•4422
•09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 4: M-59 HAYES ROAD TO ROMEO PLANK ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

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SCALE: NONE	CHECKED BY: HRP	SHEET 4 OF 8	

•4422
•09-13-94

ADDITIONAL SECTION,
NO PLAN PROVIDED

NORTH

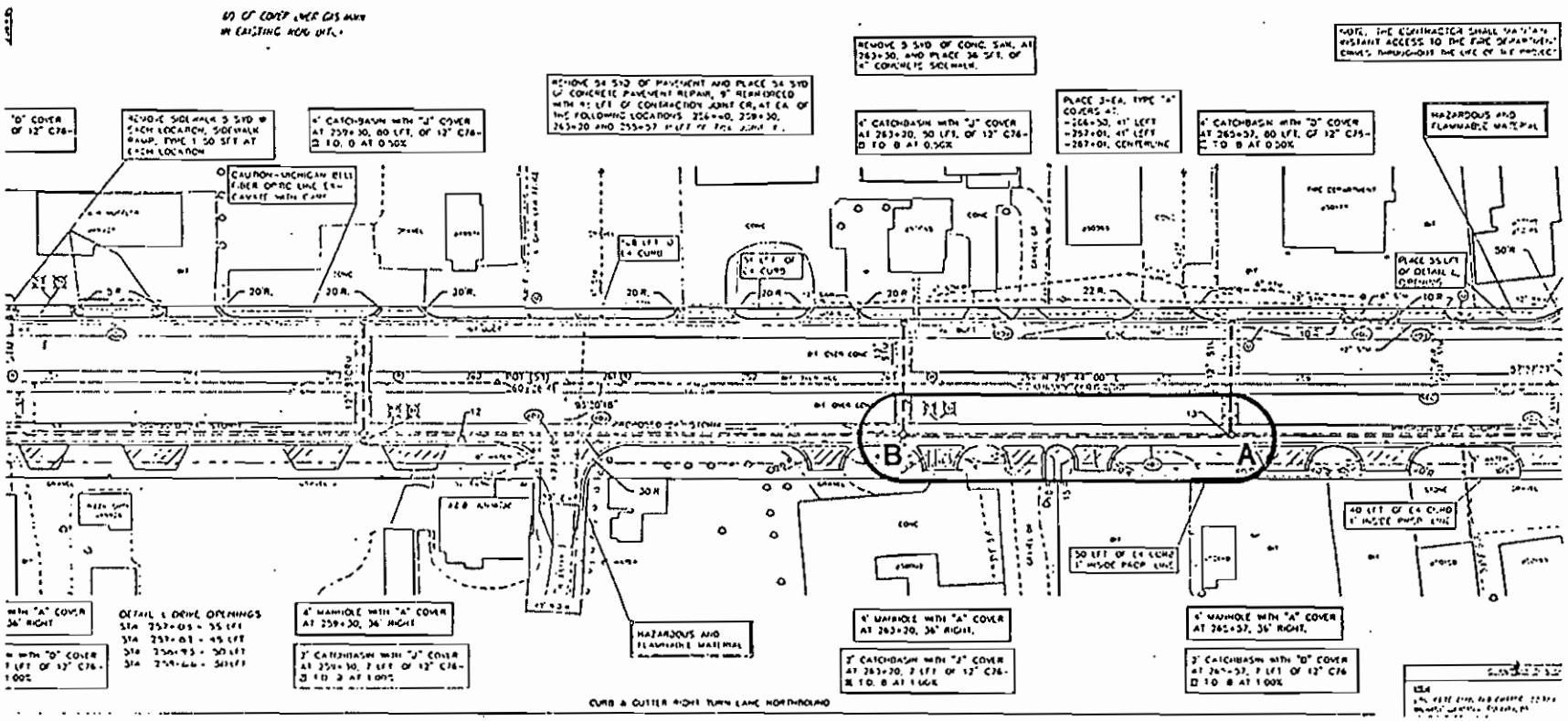
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 4: M-59 HAYES ROAD TO ROMEO PLANK

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	4 9
SCALE: NONE	CHECKED BY: HRP	SHEET 9 OF 9	

•4422
•09-13-94



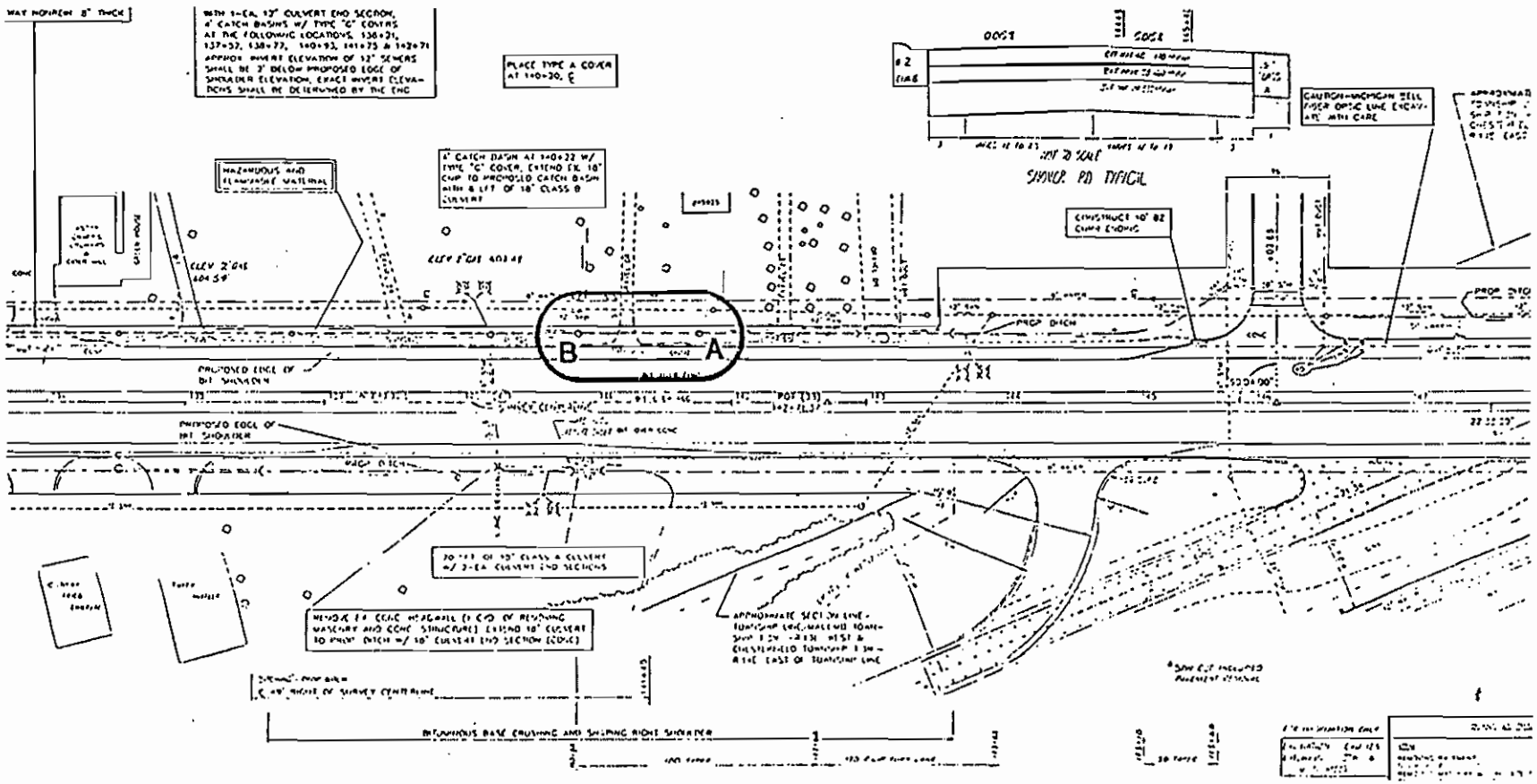
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 5: M-3 NORTH OF HENRY JOY ROAD TO 23 MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	5 · 1
SCALE: NONE	CHECKED BY: HRP	SHEET 5 OF 5	

#4422
09-13-94



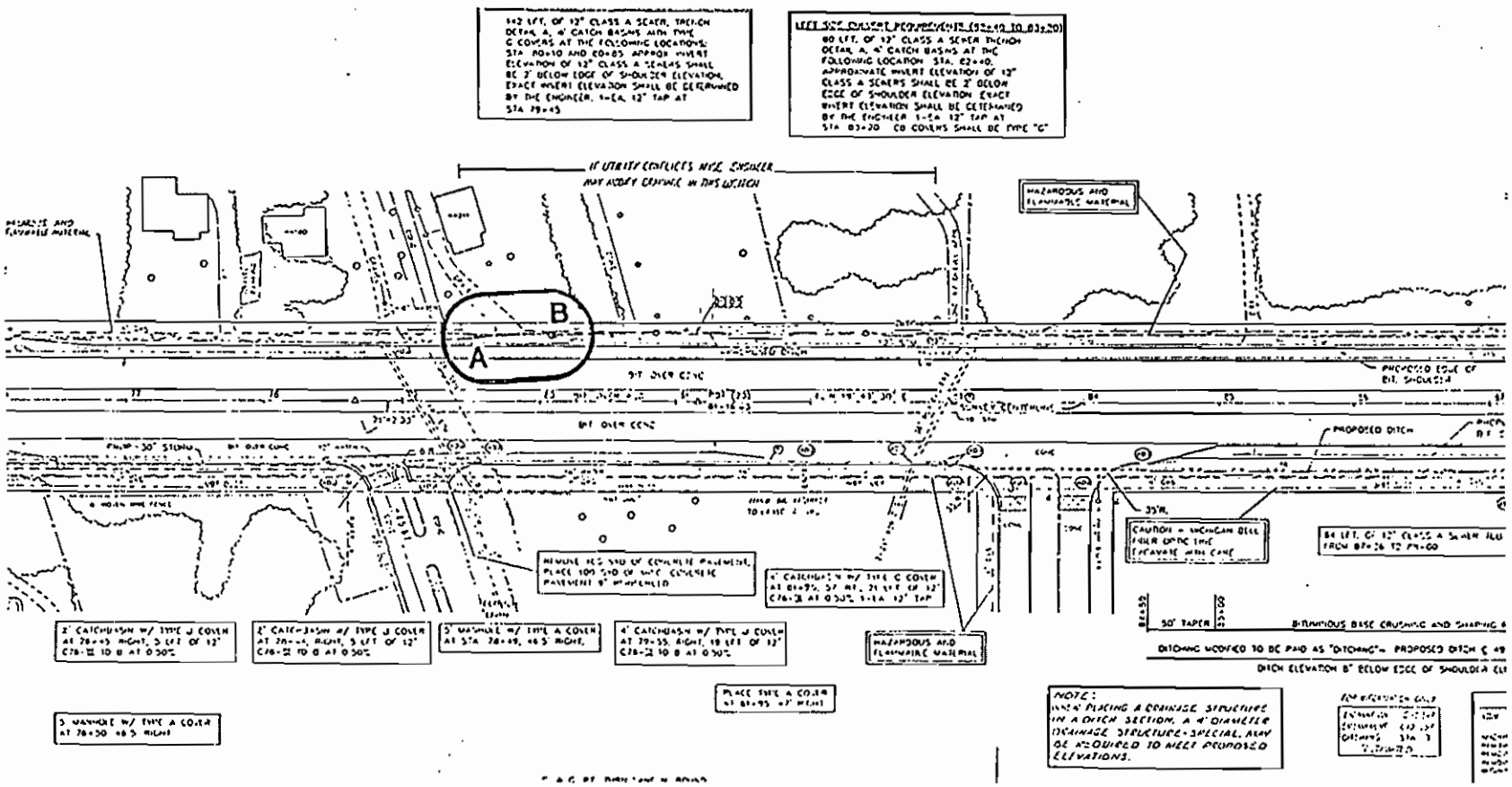
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 5: M-3 NORTH OF HENRY JOY ROAD TO 23 MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	5 2
SCALE: NONE	CHECKED BY: HRP	SHEET 4 OF 5	

#4422
#09-13-94



NORTH

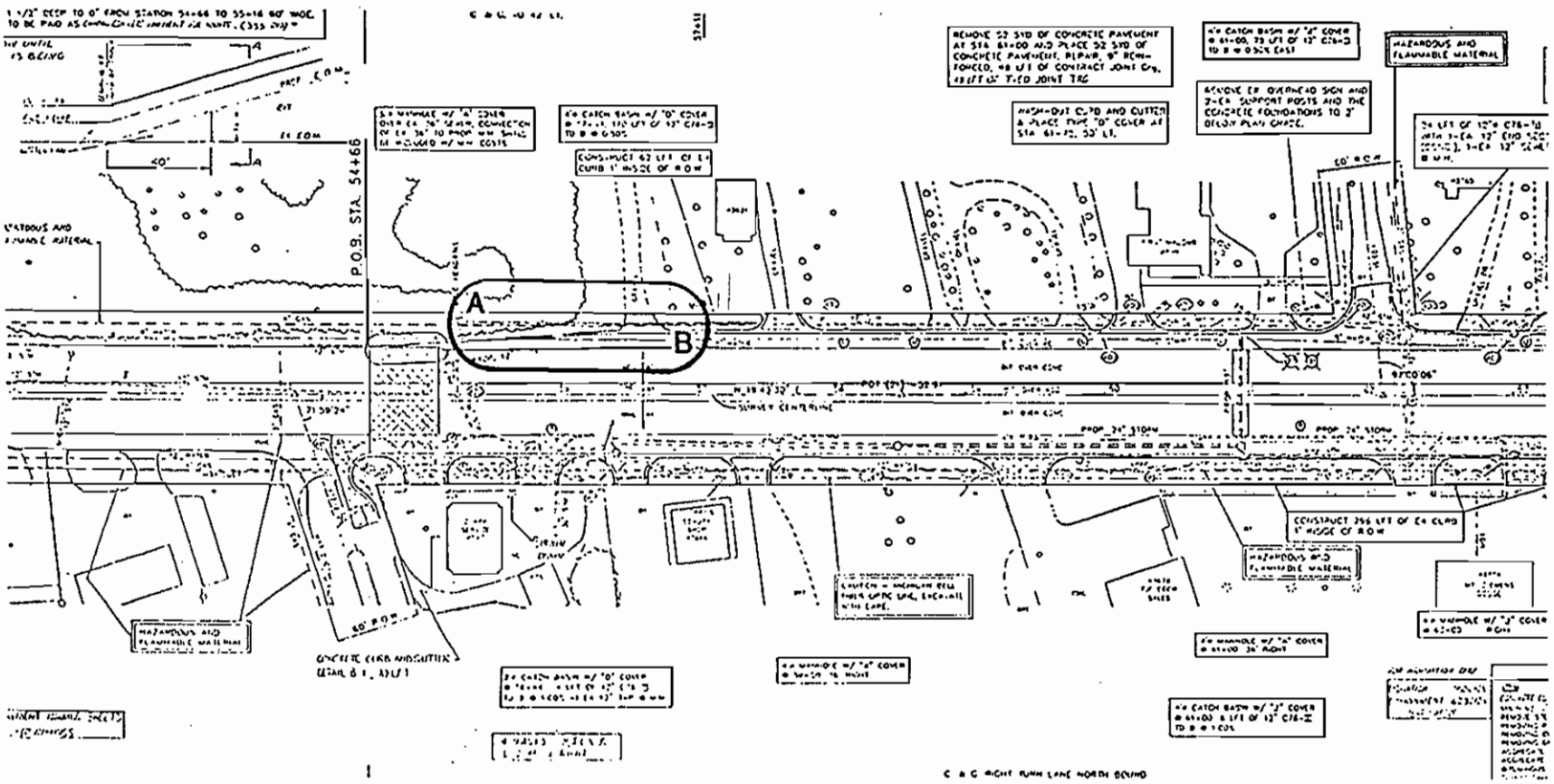
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 5: M-3 NORTH OF HENRY JOY ROAD TO 23 MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	5 3
SCALE: NONE	CHECKED BY: HRP	SHEET 3 OF 5	

#4422
09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 5: M-3 NORTH OF HENRY JOY ROAD TO 23 MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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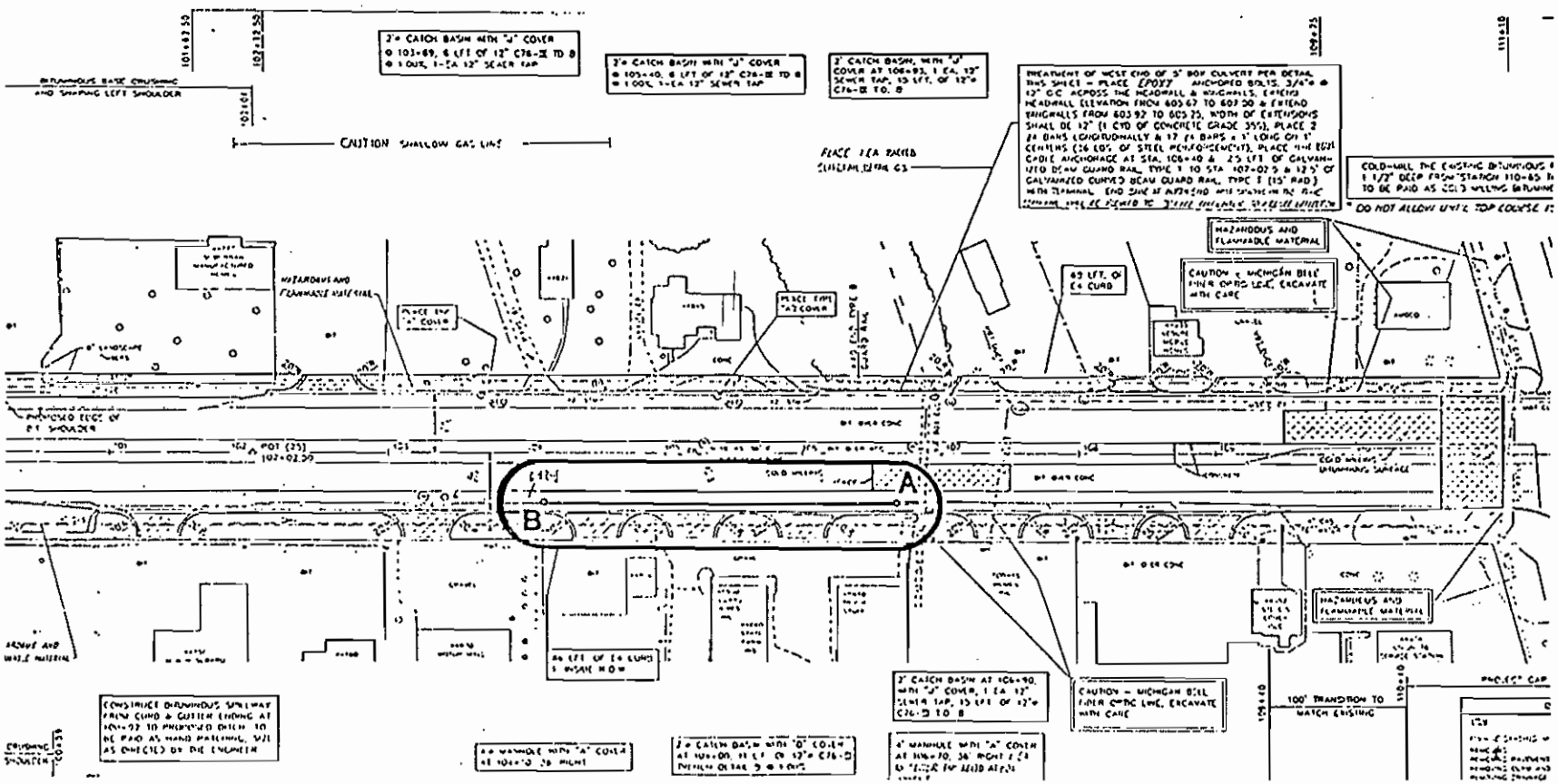
#4422
09-13-94



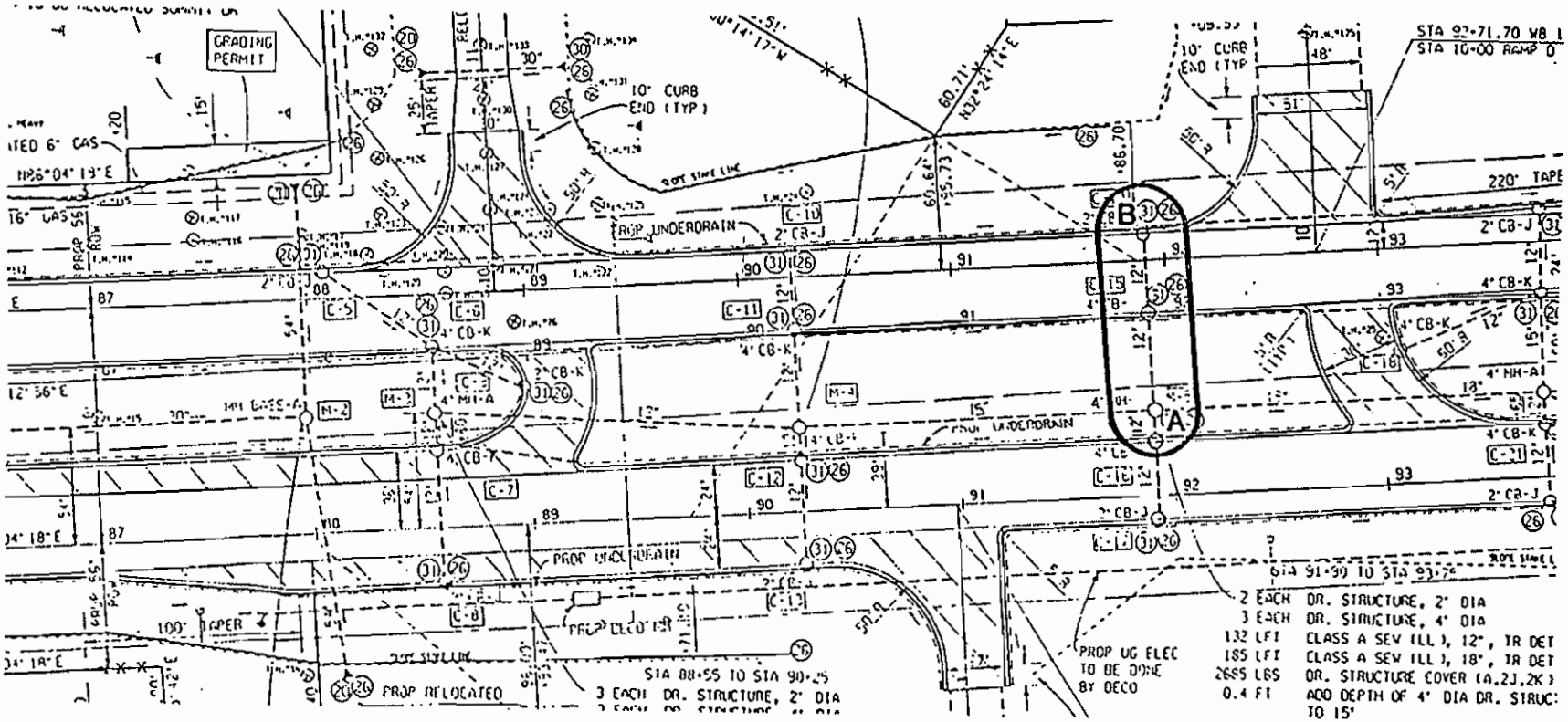
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 5: M-3 NORTH OF HENRY JOY ROAD TO 23 MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	5 5
SCALE: NONE	CHECKED BY: HRP	SHEET 1 OF 5	

#4422
09-13-94



NORTH

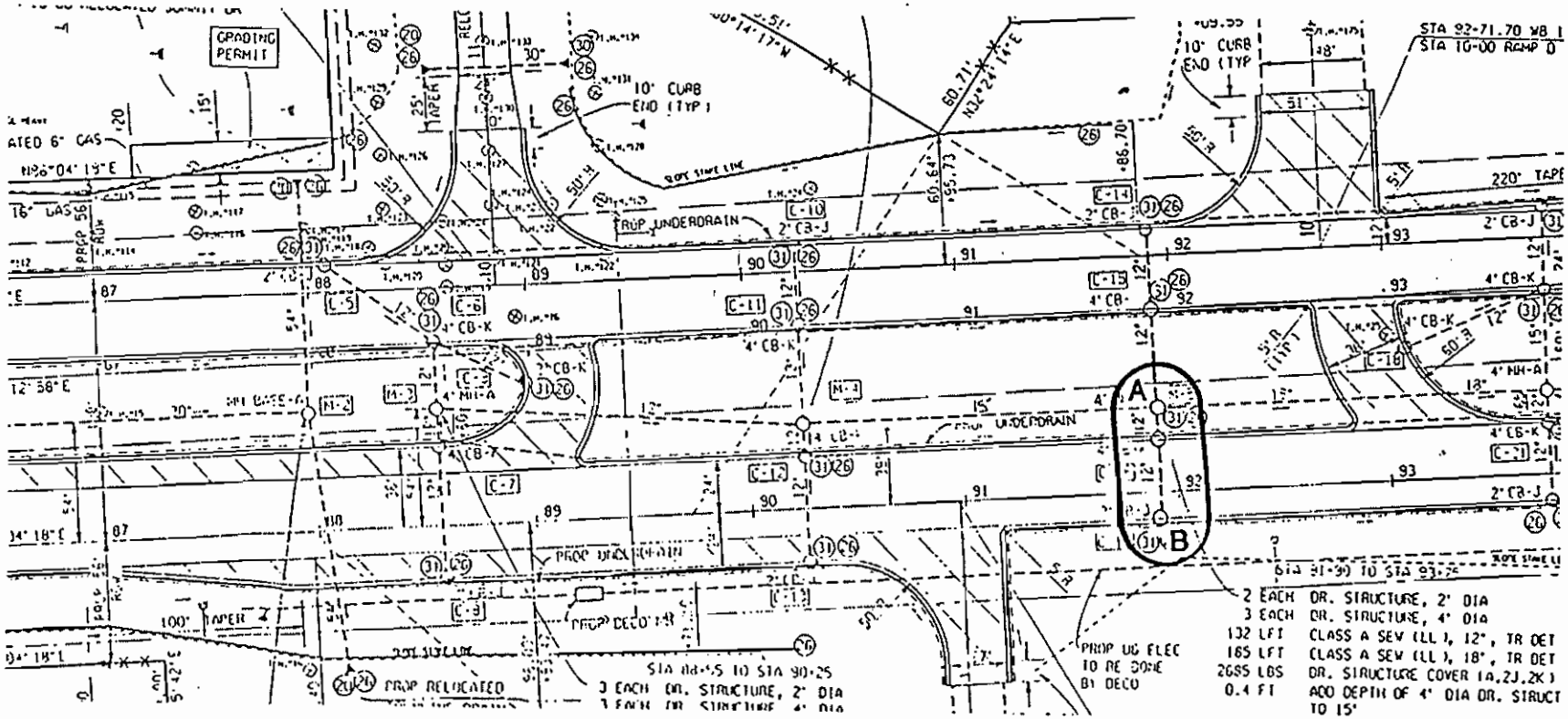
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 6: M-5 AND TWELVE MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	6 1
SCALE: NONE	CHECKED BY: HRP	SHEET 1 OF 10	

#4422
09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 6: M-5 AND TWELVE MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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SCALE: NONE	CHECKED BY: HRP	SHEET 2 OF 10	

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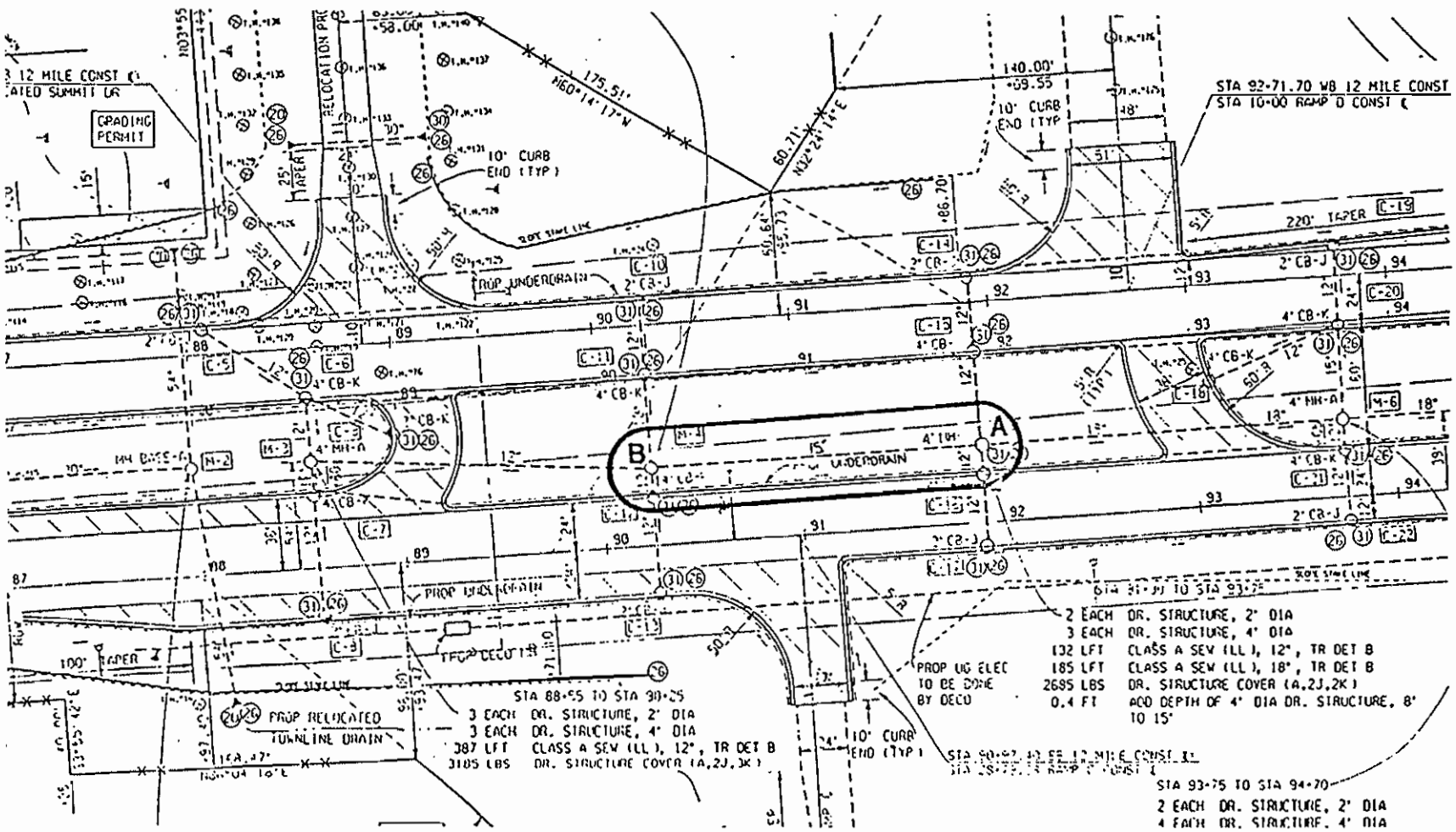


NORTH

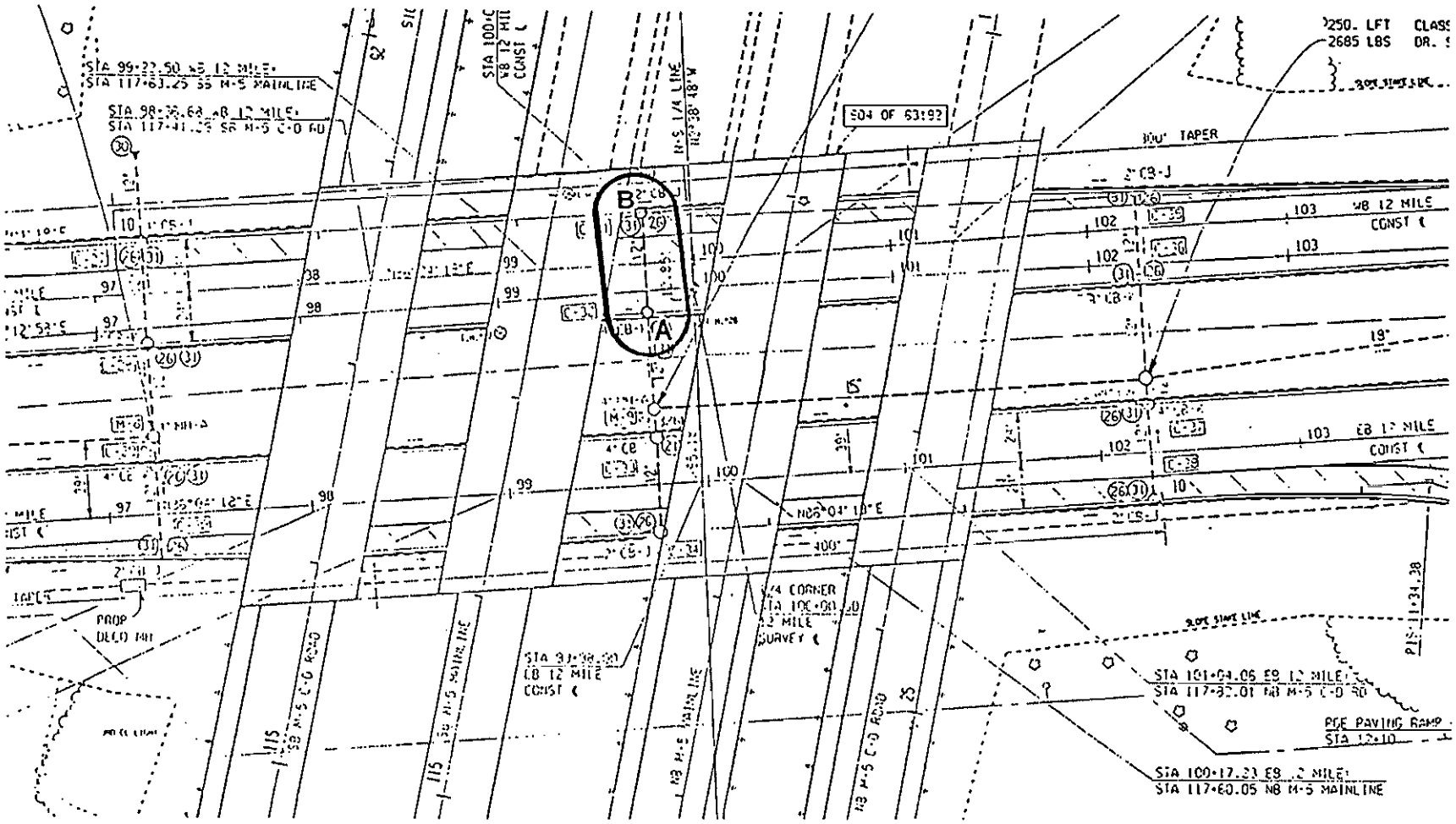
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 6: M-5 AND TWELVE MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	6 3
SCALE: NONE	CHECKED BY: HRP	SHEET 1 OF 8	

#4422
09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

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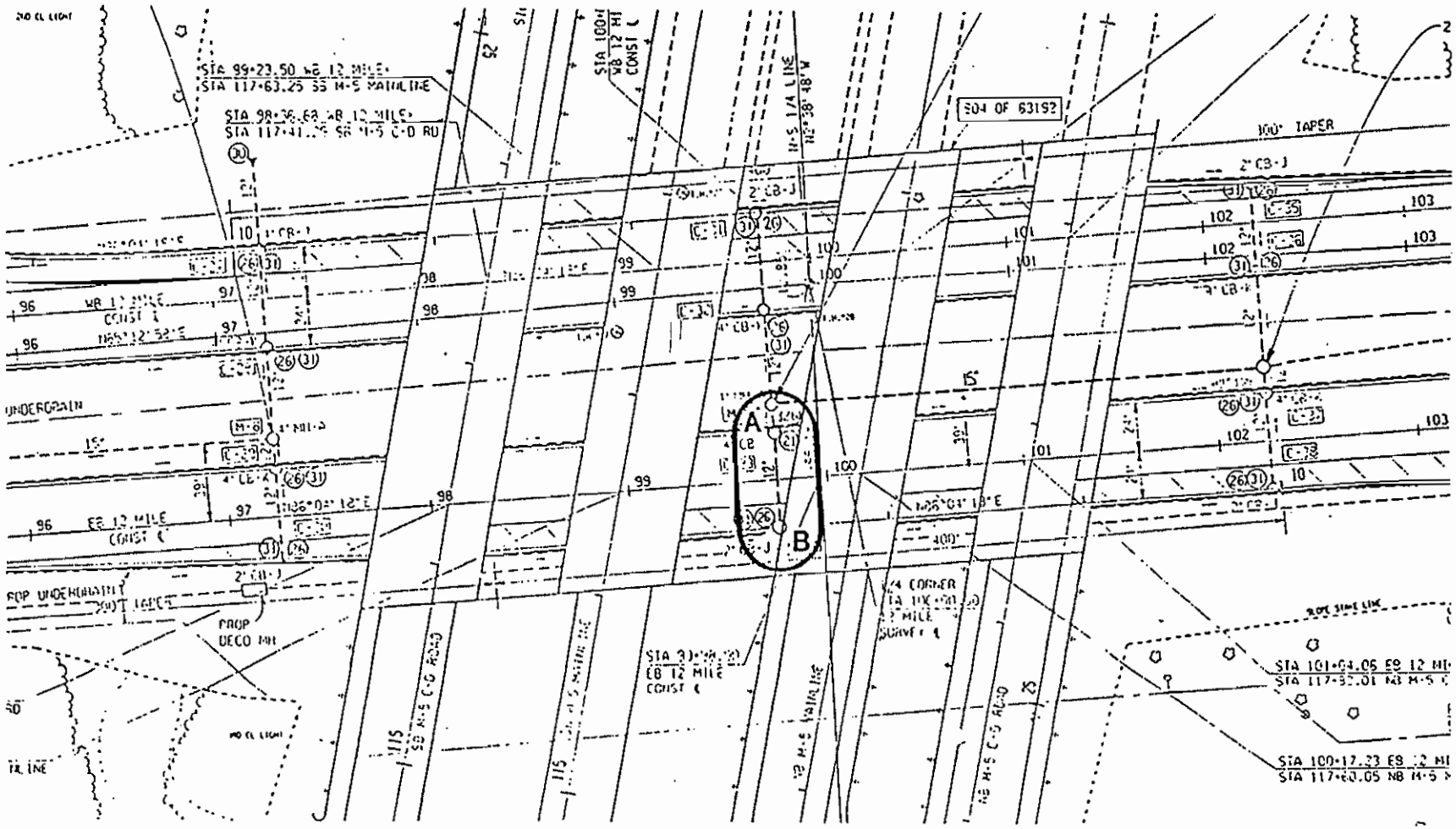
CONTRACT No. 1
SITE 6: M-5 AND TWELVE MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	6 4
SCALE: NONE	CHECKED BY: HRP	SHEET 5 OF 8	

#4422
09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 6: M-5 AND TWELVE MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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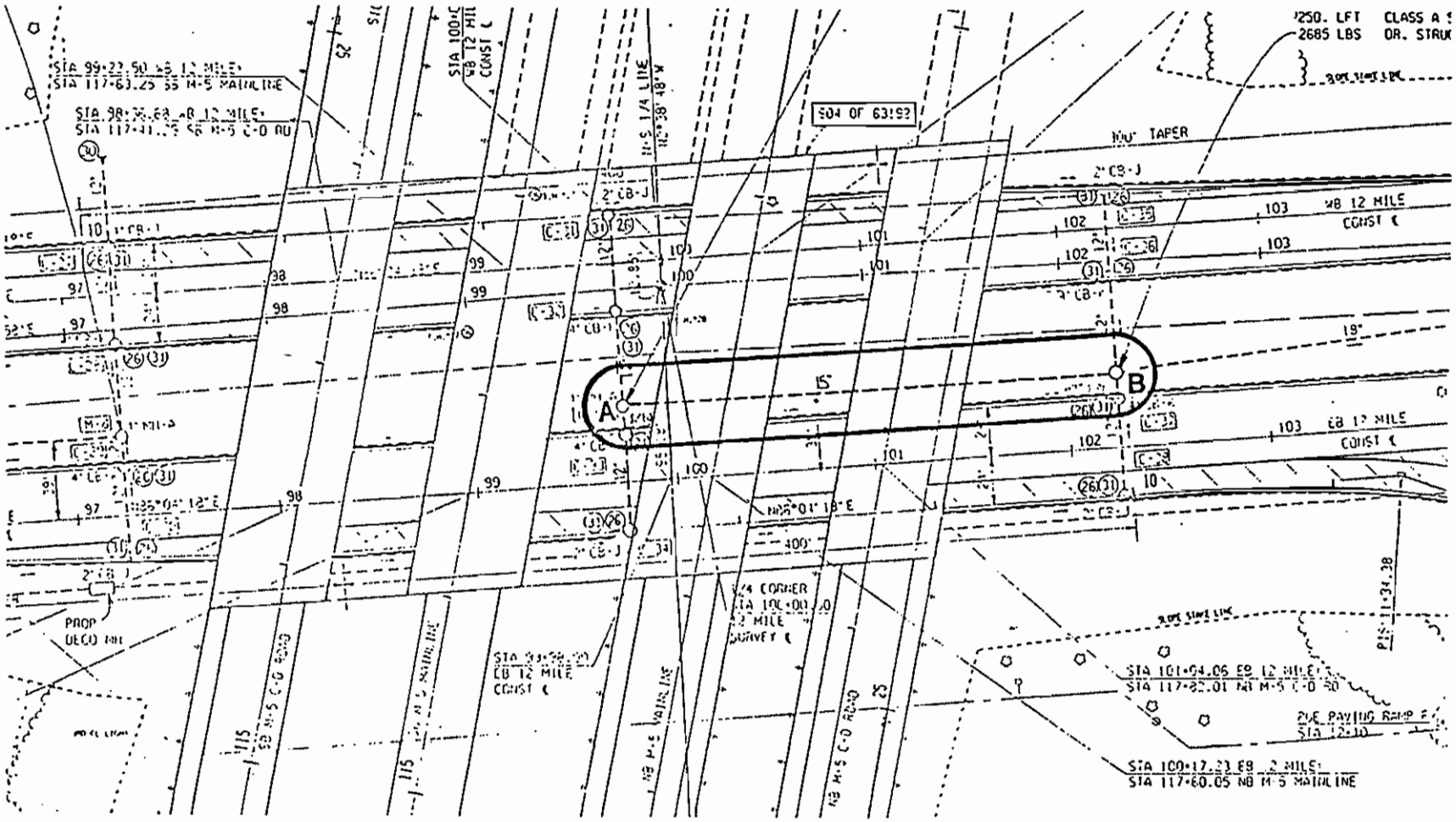
SCALE: NONE	CHECKED BY: HRP	SHEET 4 OF 8	

•4422
•09-13-94



PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 6: M-5 AND TWELVE MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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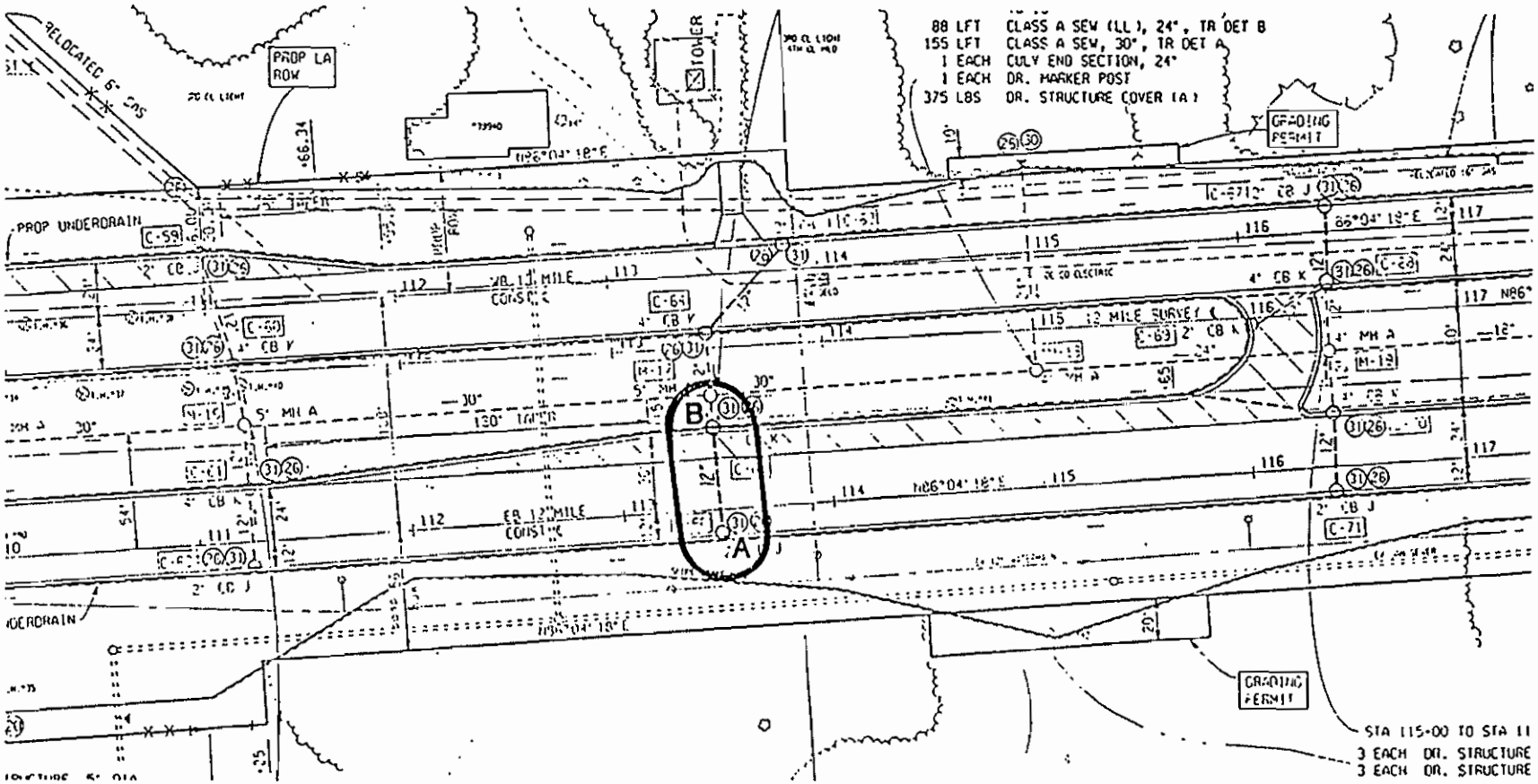
•4422
•09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 6: M-5 AND TWELVE MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	6-7
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•4422
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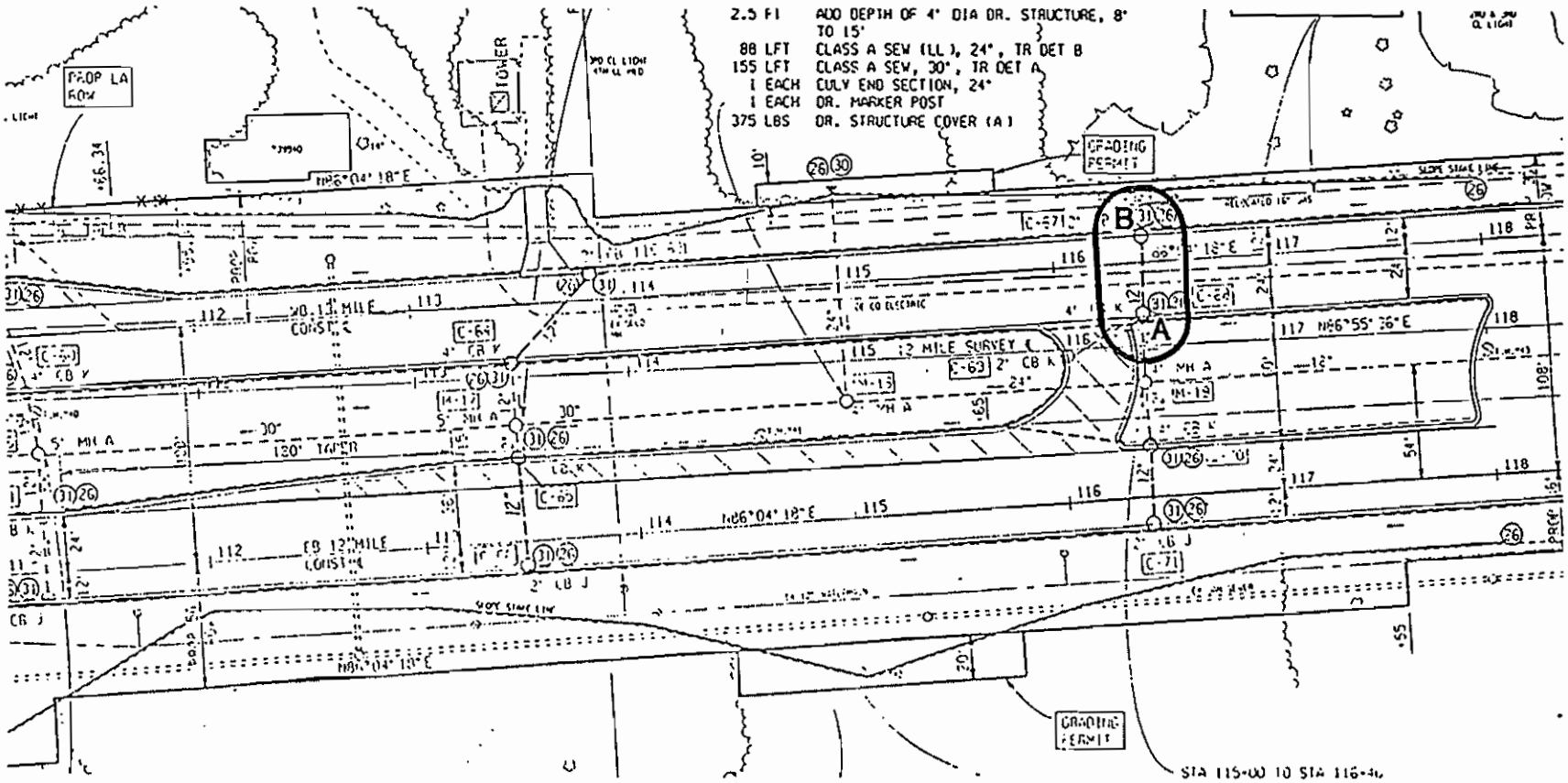

NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 6: M-5 AND TWELVE MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

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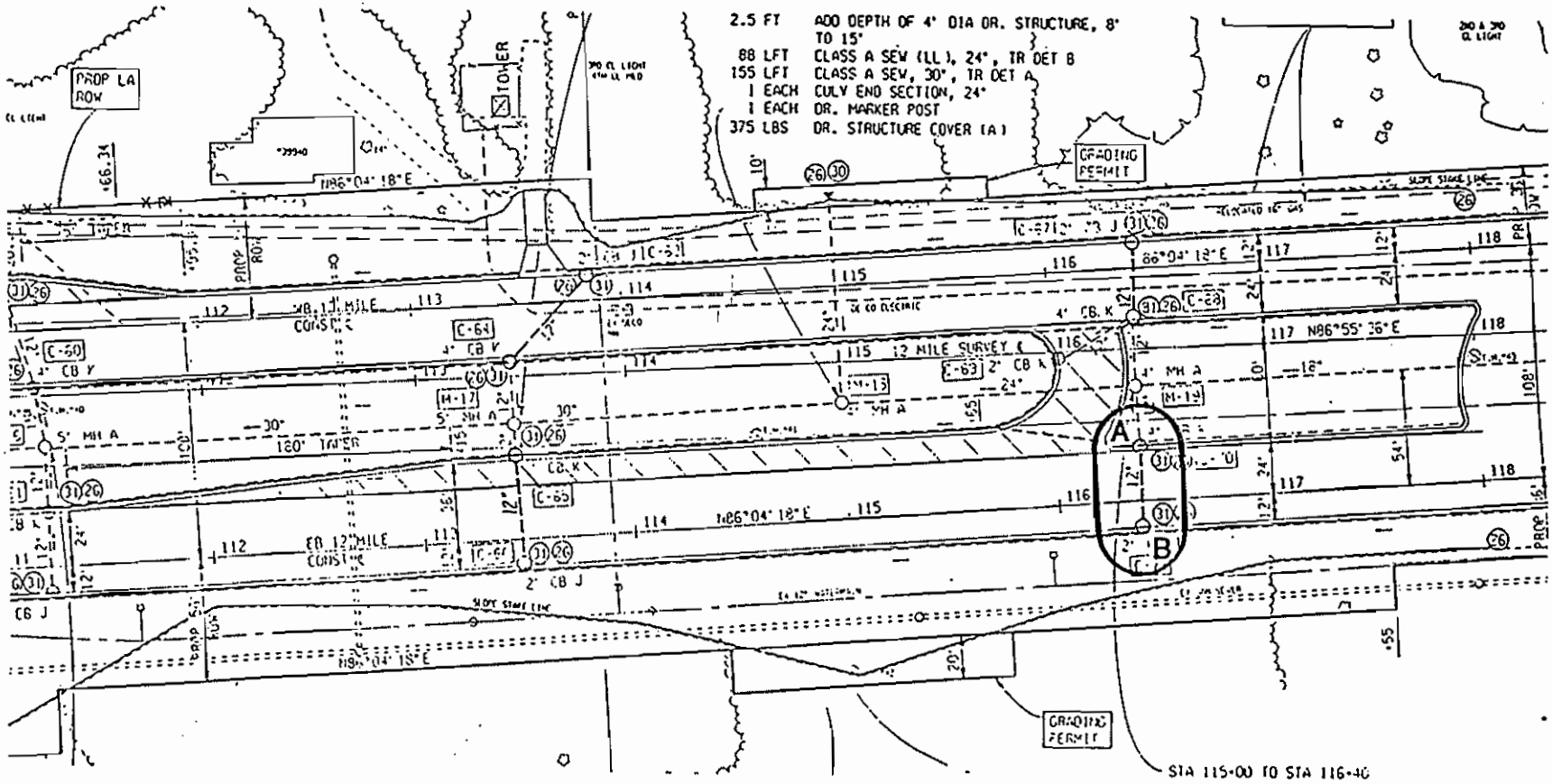
•09-13-94

2.5 FT ADD DEPTH OF 4' DIA DR. STRUCTURE, 8' TO 15'
88 LFT CLASS A SEW (LL), 24", TR DET B
155 LFT CLASS A SEW, 30", TR DET A
1 EACH CULV END SECTION, 24"
1 EACH DR. MARKER POST
375 LBS DR. STRUCTURE COVER (A)



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PIPE SEGMENT LOCATION PLAN

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SITE 6: M-5 AND TWELVE MILE ROAD

NTH CONSULTANTS, LTD.
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Detroit, Michigan

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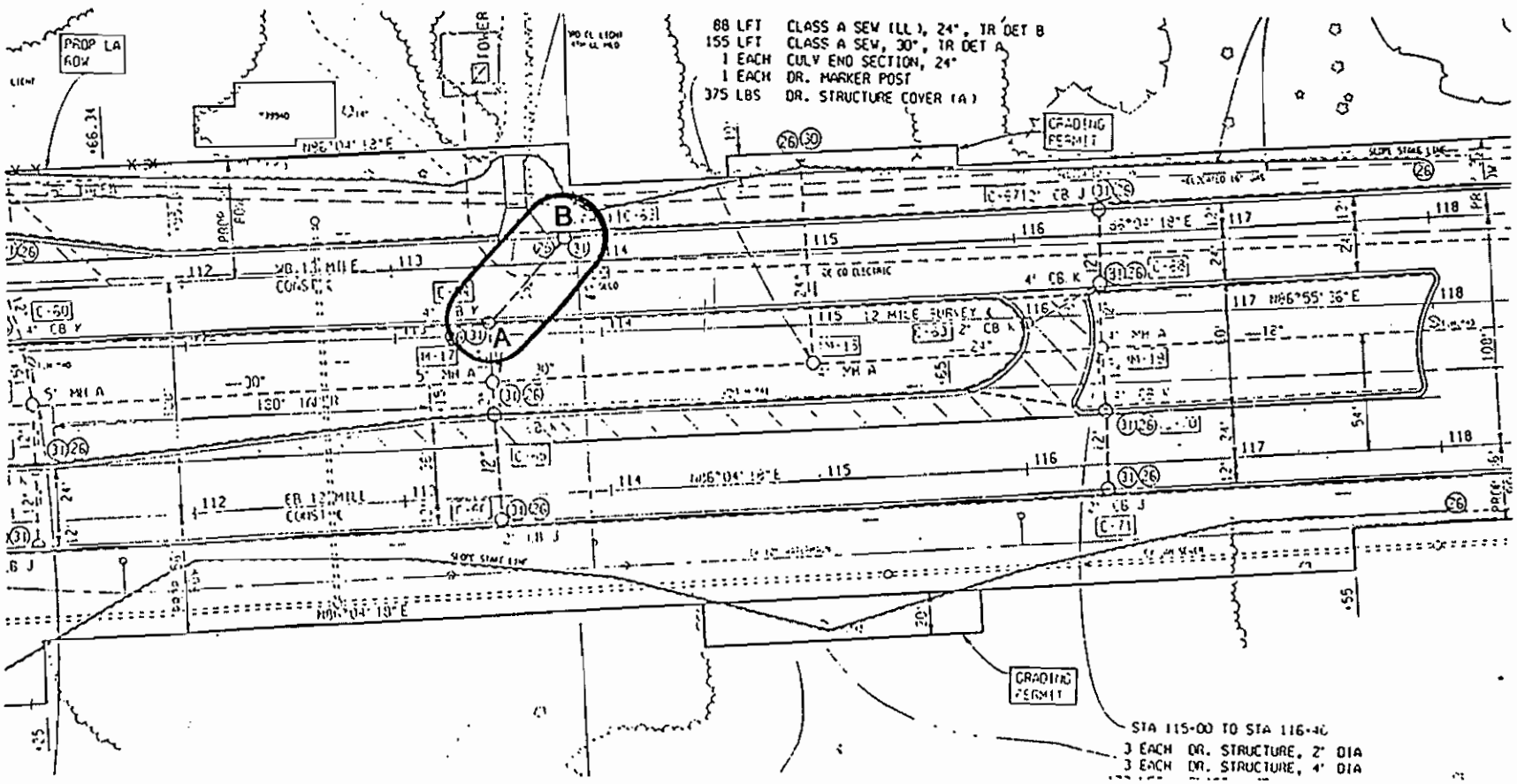

NORTH

PIPE SEGMENT LOCATION PLAN

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SITE 6: M-5 AND TWELVE MILE ROAD

NTH CONSULTANTS, LTD.
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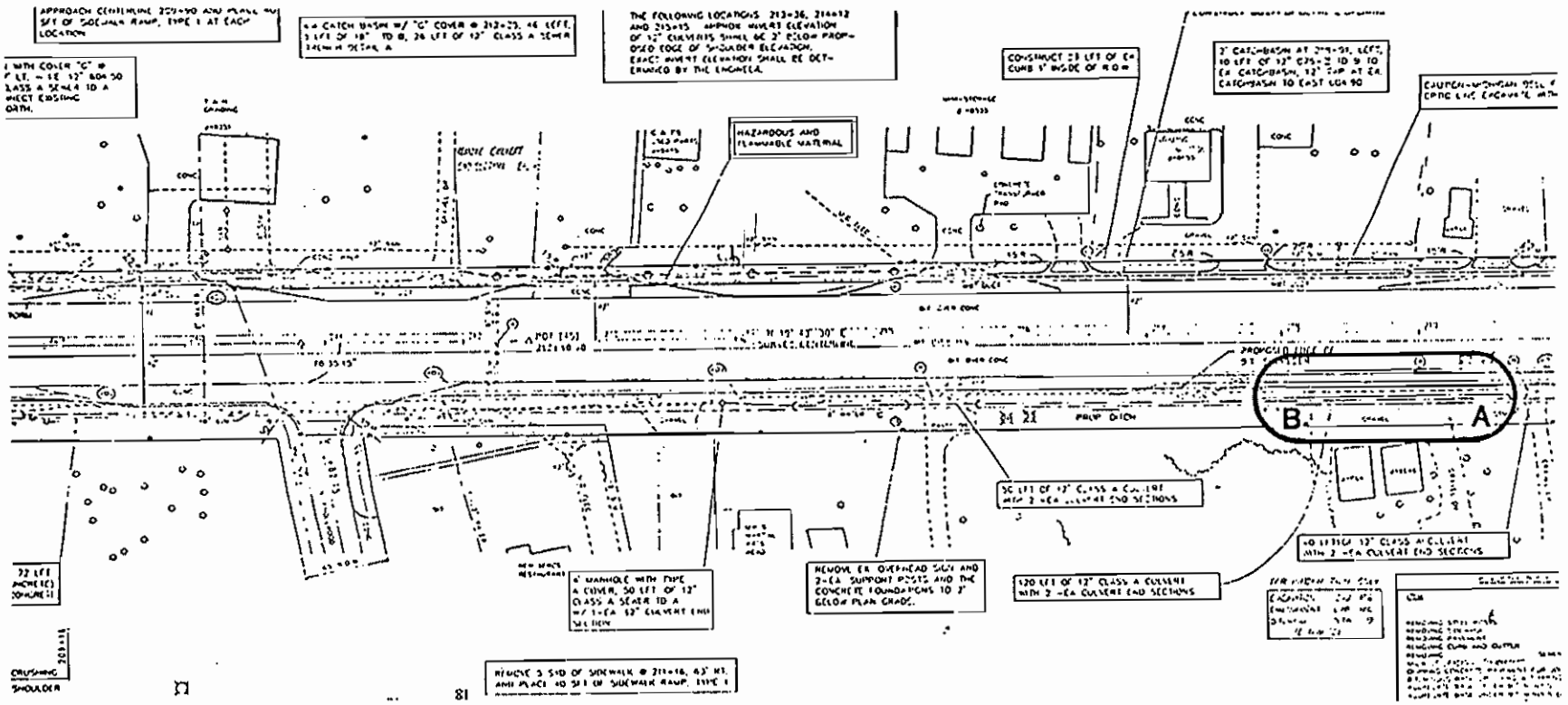
•4422
•09-13-94



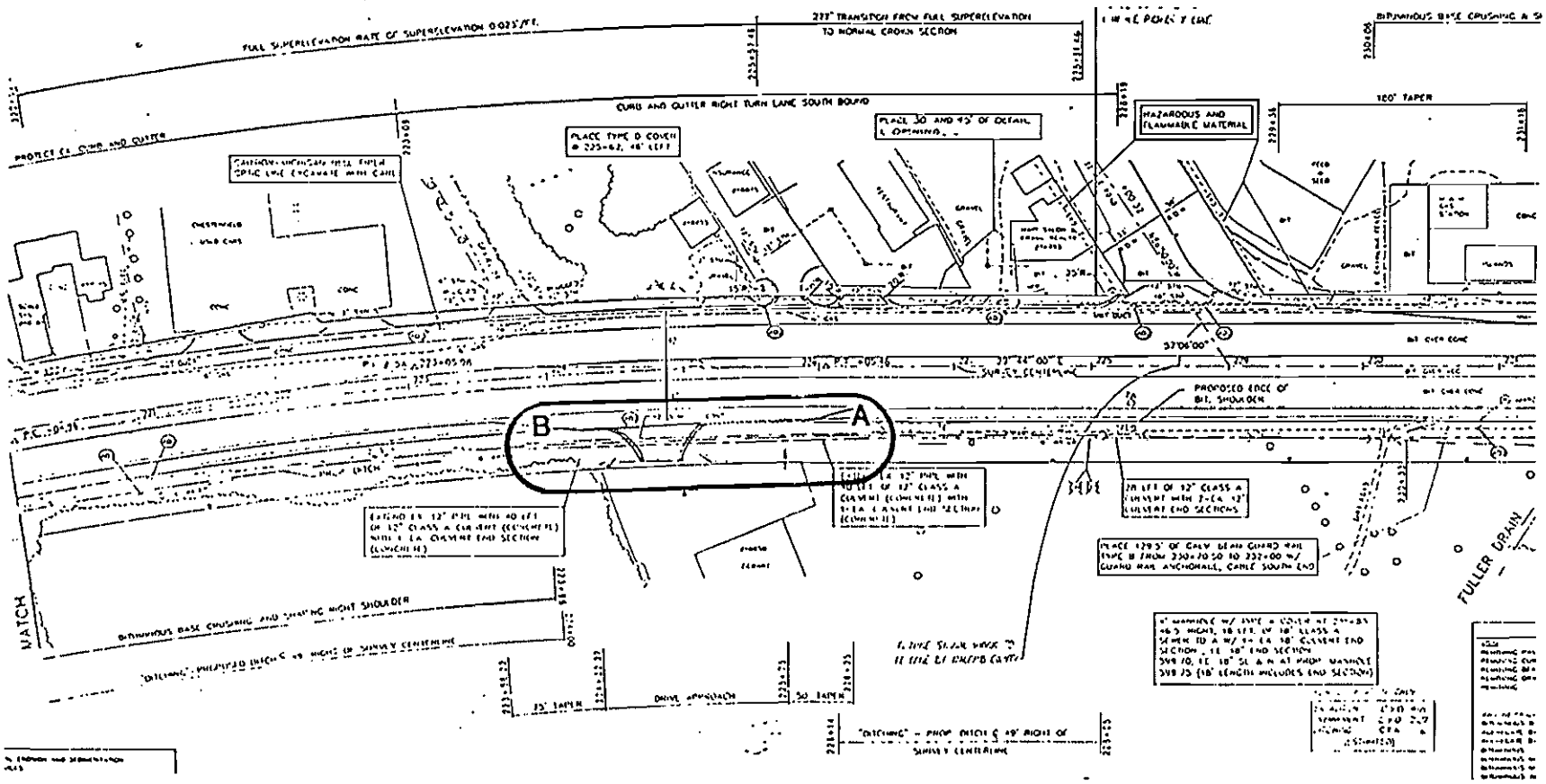
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 7: M-3 ONE HALF MILE NORTH OF M-59 TO 23 MILE RD.

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	7 1
SCALE: NONE	CHECKED BY: HRP	SHEET 1 OF 3	

•4422
•09-13-94



NORTH

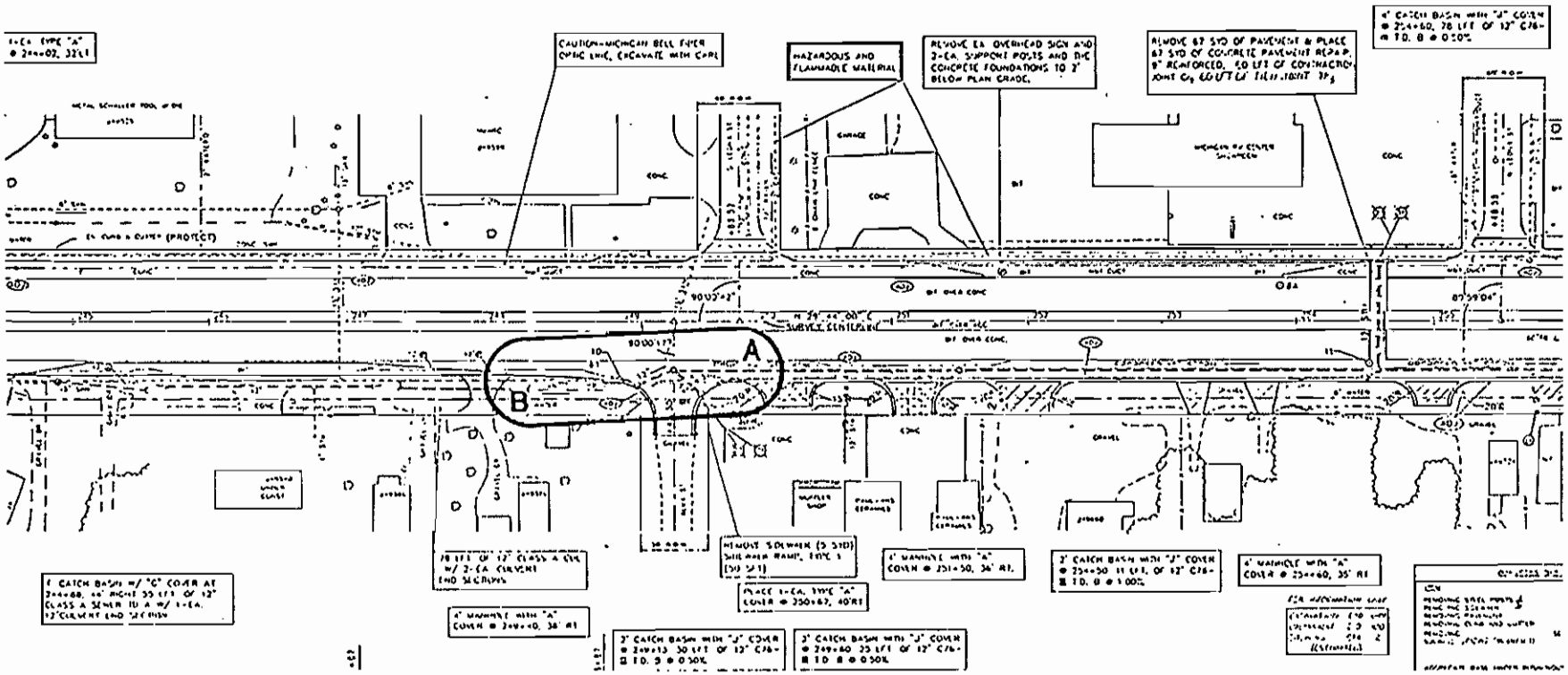
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 7: M-3 ONE HALF MILE NORTH OF M-59 TO 23 MILE RD.

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	7-2
SCALE: NONE	CHECKED BY: HRP	SHEET 2 OF 3	

•4422
•09-13-94



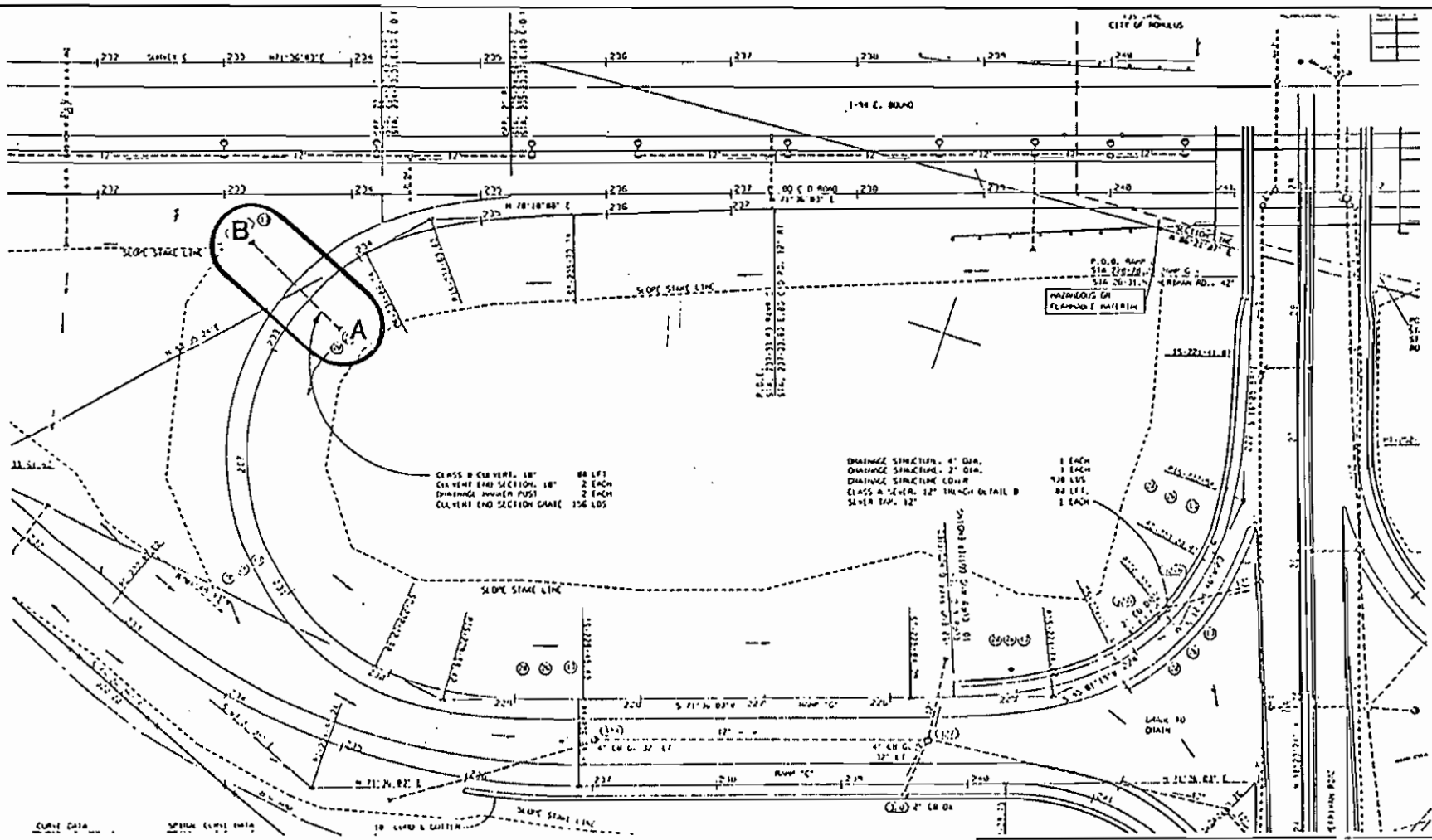
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 7: M-3 ONE HALF MILE NORTH OF M-59 TO 23 MILE RD.

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	7 3
SCALE: NONE	CHECKED BY: HRP	SHEET 3 OF 3	

#4422
#09-13-94



NORTH

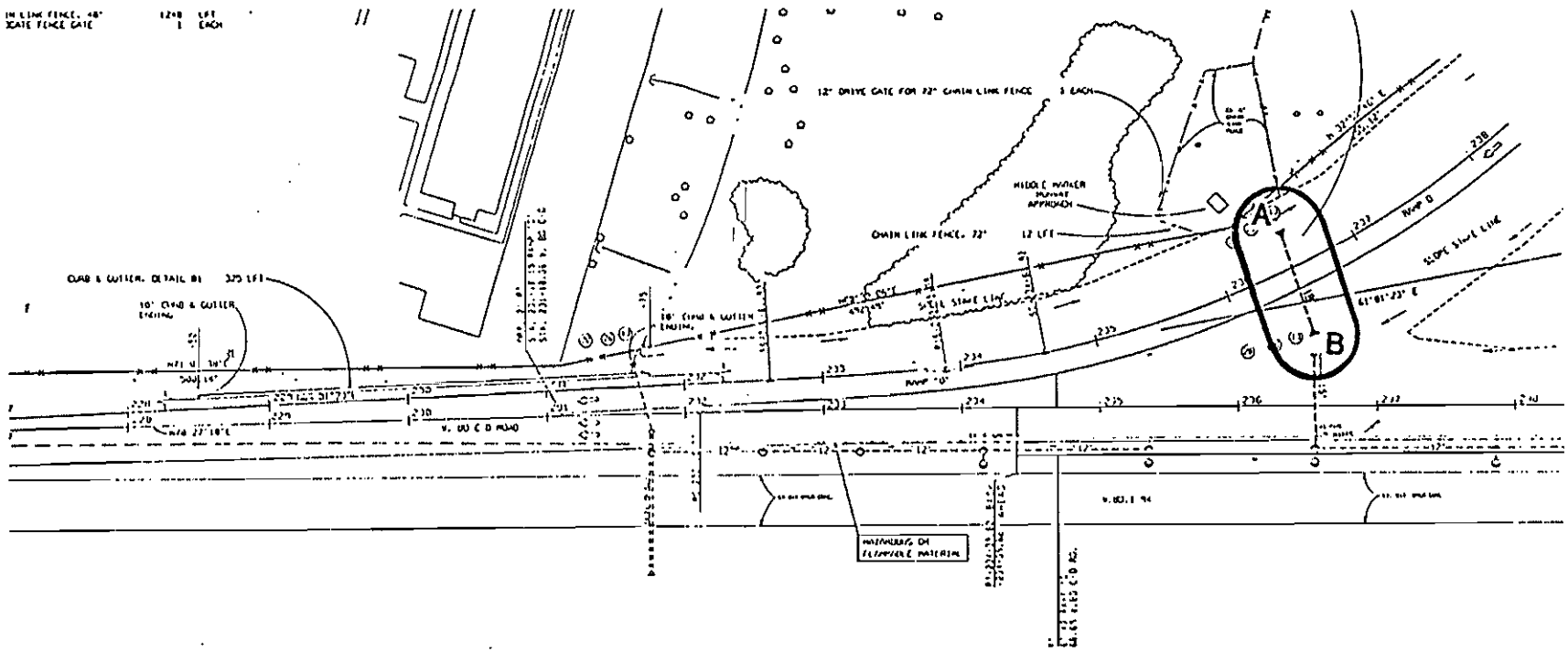
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 8: I-94 MERRIMAN AND MIDDLEBELT INTERCHANGES

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	8 - 1
SCALE: NONE	CHECKED BY: HRP	SHEET 3 OF 3	

•4422
•09-13-94



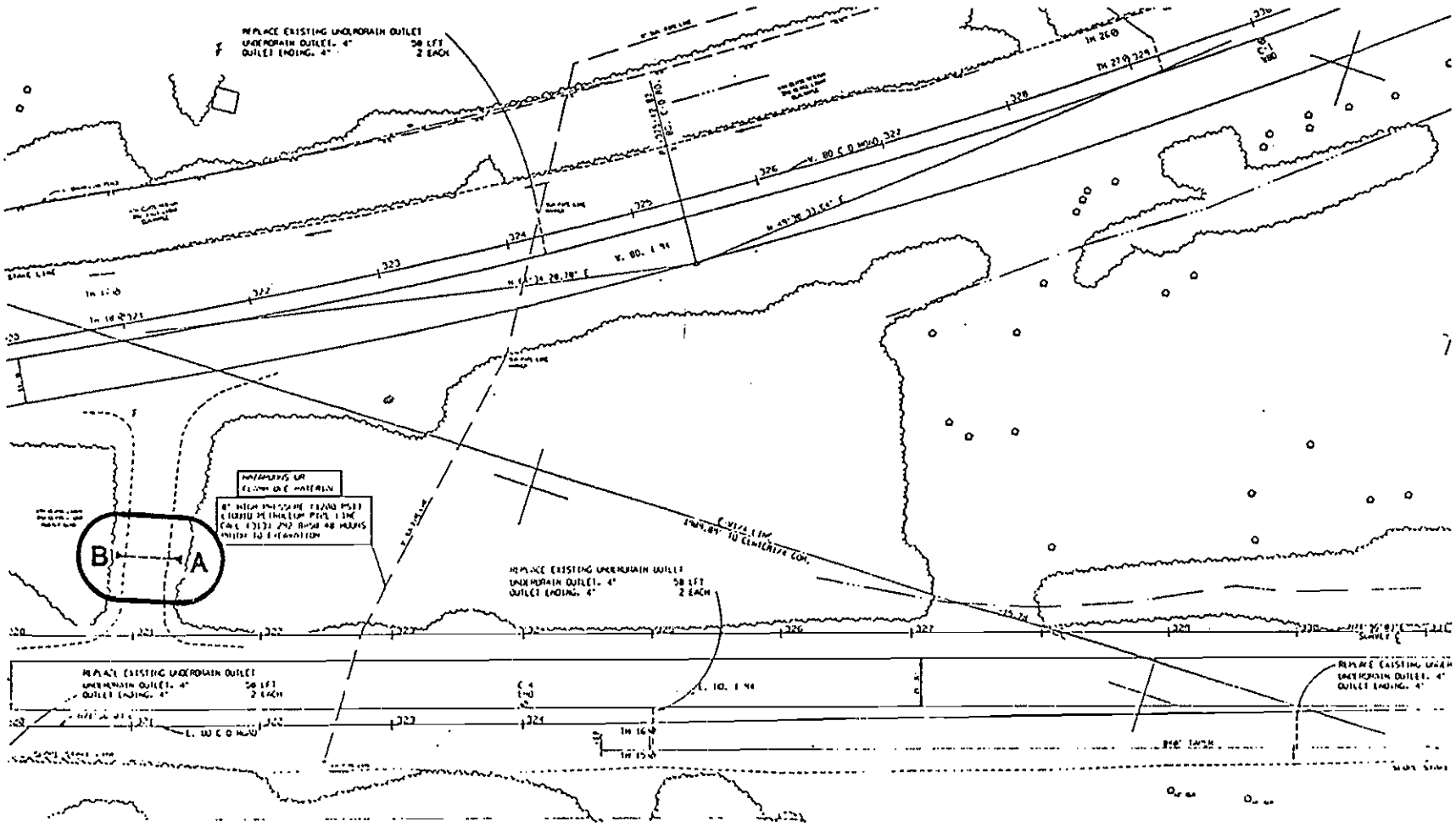
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 8: I-94 MERRIMAN AND MIDDLEBELT INTERCHANGES

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	8 2
SCALE: NONE	CHECKED BY: HRP	SHEET 2 OF 3	

#4422
#09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 1
SITE 8: I-94 MERRIMAN AND MIDDLEBELT INTERCHANGES

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4422-00	SHB	09-13-94	8-3
SCALE: NONE	CHECKED BY: HRP	SHEET 1 OF 3	

#4422
09-13-94

Roots

- *F - Fine*
- *M - Mass*
- *(J) - Joint*
- *(T) - Tap*

Line

- *DR Displaced to Right - Estimate Offset*
- *DL Displaced to Left - Estimate Offset*

Crack

CF	*Fine -*	*< 1 mm / 0.04 In.*
CM	*Medium -*	*1 mm - 2 mm (0.04 In. - 0.08 In.)*
CL	*Large -*	*> 2 mm*

Ln	*Longitudinal*
Tr	*Transverse*
C	*Circumferential*
M	*Multiple*

Grade

- *D Dip - Estimate Depth*
- *H Heave - Estimate Rise*

Deformation - Estimate to nearest 5%, collapsed pipe also estimated to nearest 5%.

D - Deformed, C - Collapsed Br - Broken

Infiltration

IE	*- Encrustion H > 20% M 5 - 20% L < 5% area*	
IS	*- Seepage*	
ID	*- Dripping*	
IR	*- Runner - Steady Stream*	*< 1/4 Inch in Diameter*
IG	*- Gusher - Steady Stream*	*> 1/4 Inch in Diameter*

Debris

DBS	*- Sludge*		
DBG	*- Granular*	*(S)*	*Sand*
		(G)	*Gravel*
		(S/C)	*Silt/Clay*

Obstruction

OW	*- Wood*	*OO*	*- Other*
OC	*- Concrete*	*OB*	*- Brick*
OM	*- Metal*		

Joints

JO	*- Joint Open - Estimate Size*
JD	*- Joint Displaced - Estimate Percentage*

Estimate Relative Position by Clock Reference
Indicate Orientation of Clock Reference

Project No. 34-4422-00 Date: 9-6-94 Field Engineer: P. SPALDING

Site Location: US-24 STA. 276+35 MDOT Designation: 63053-13600A

Beginning Point: "A" STA. 276+35

Ending Point: "B"

Depth to Invert: Pipe Size: 12 IN. Material: CONCRETE Flow Direction: A ← B

Video Tape No.: 2 Counter Data: 0000-0261 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
53-57 FT					S/C				

12

FAST Direction 9 ◯ 3 WEST Direction

6

Remarks: DEBRIS BETWEEN 53-57FT @ 6:00-9:00. POSSIBLE CONCRETE DEPOSIT

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION

Repair: Replace:

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Project No. 34 4422-00 Date: 7-6-94 Field Engineer: P. SPALDING

Site Location: US 24 STA. 280+40 MDOT Designation: 63053-13600A

Beginning Point: "A" 280+40

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 18 IN Material: CONCRETE Flow Direction: A ← B

Video Tape No.: 2 Counter Data: 0261-0550 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
41-44 FT		CF/Ln							
46-51 FT								D	

12

EAST Direction 9 ○ 3 WEST Direction

6

Remarks: CRACK @ 12:00

DIP 46-51 FT — 2 TO 4 INCHES

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: UPPER HALF OF PIPE IN GOOD CONDITION, BOTTOM HALF OF PIPE NOT VISIBLE DUE TO FLOW. CONTRACTOR WAS PUMPING (CONT'D ON SHT. 2)

Repair: PIPE DOWNSTREAM SHOULD BE CHECKED FOR BLOCKAGE Replace: _____

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Project No. 34 4422-00 Date: 9-6-94 Field Engineer: P. SPALDING

Site Location: US 24 STA 280+40 MDOT Designation: 63053-13600A

Beginning Point: 'A' STA 280+40

Ending Point: 'B'

Depth to Invert: Pipe Size: 18 IN. Material: CONCRETE Flow Direction: A → B

Video Tape No.: 2 Counter Data: 0261-0550 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12
EAST Direction 9 ◯ 3 WEST Direction
6

Remarks:

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: WATER TO MAINTAIN LEVEL. SYSTEM DOWNSTREAM APPARENTLY PLUGGED

Repair: Replace:

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Project No. 34422-00 Date: 9-6-94 Field Engineer: P. SPALDING

Site Location: US-24 STA. 343+20 MDOT Designation: 63053-13600A

Beginning Point: 'A'

Ending Point: 'B'

Depth to Invert: _____ Pipe Size: 12 IN. Material: CONCRETE Flow Direction: A ← B

Video Tape No.: 2 Counter Data: 0550-0740 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
10 FT		CM/Ln							
39 FT				OC					

12
EAST Direction 9 ◯ 3 WEST Direction
6

Remarks: 10 FT-CRACK @ 10:00
HEAVY CONCRETE DEPOSIT IN
CATCH BASIN "B"

Assessment:
Good Poor
(5) 4 3 2 1

Evaluation: PIPE IN GOOD CONDITION.

Repair: REMOVE CONCRETE FROM CATCH BASIN "B" Replace: _____

Probable Causes of Observed Distress
PIPE CRACKING PROBABLY DUE TO VARIATION IN BEDDING

Evaluation By: QUICK

Project No. 34-4422-00 Date: _____ Field Engineer: P. SPALDING

Site Location: US-24 STA. 412+40 TO STA. 413+40 MDOT Designation: 63053-13600A

Beginning Point: "A" STA. 412+40

Ending Point: "B" STA. 413+40

Depth to Invert: _____ Pipe Size: 15IN Material: CONCRETE Flow Direction: A → B

Video Tape No.: 2 Counter Data: 0746-0981 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
28 FT		CM Ln							

12

SOUTH Direction 9 ◯ 3 NORTH Direction

6

Remarks: 28 FT LONGITUDINAL CRACK @ 12:00

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION

Repair: _____ Replace: _____

Probable Causes of Observed Distress

CRACK PROBABLY CAUSED BY VARIATION IN BEDDING

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 9-6-94 Field Engineer: P. SPALDING

Site Location: M-59 STA. 67+00 TO STA. 68+70 MDOT Designation: 63043-26069A

Beginning Point: "A" STA. 67+00

Ending Point: "B" STA 68+70

Depth to Invert: _____ Pipe Size: 18 IN. Material: CONCRETE Flow Direction: A → B

Video Tape No.: 2 Counter Data: 0981-1310 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
40FT		CF Ln							
70FT		CM Ln							
107-117 FT		CM Ln							
125-135 FT		CM Ln							
142 FT		CM Ln							

12

NORTH Direction 9 ◯ 3 SOUTH Direction

6

Remarks: LONGITUDINAL CRACKS PRESENT BETWEEN 125 AND 167 FT. CRACKS LOCATED BETWEEN 10:00 AND 2:00

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION

Repair: _____ Replace: _____

Probable Causes of Observed Distress

CRACKS RESULTING FROM VARIATION IN BEDDING & LATERAL SUPPORT

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 9-6-94 Field Engineer: P. SPALDING

Site Location: M-59 STA. 107+93 E.B. MDOT Designation: 63043-26069A

Beginning Point: "A" STA. 107+93

Ending Point: "B" STA

Depth to Invert: Pipe Size: 12 IN. Material: CONCRETE Flow Direction: A ← B

Video Tape No.: 2 Counter Data: 1310-1678 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
21 FT		CM/Ln							JD
46 FT		CF/C				IS			
54 FT		CF/C				IS			
59 FT		CF/Ln							
62 FT		CM/C				IS			
64-69 FT		CF/Ln							

12
WEST Direction 9 ○ 3 EAST Direction
6

Remarks: CRACKS: 21FT - 1:00, 46FT 12:00, 59FT - 12:00, 62FT - 12:00, 64-69FT - 12:00, 93FT - 2:00
* CEMENT/MORTAR ON INVERT OF PIPE 5:00 - 8:00 BETWEEN 82 & 90 FT.

Assessment:

Good 5 4 (3) 2 1 Poor

Evaluation: PIPE IN GOOD TO FAIR CONDITION

Repair: Replace:

Probable Causes of Observed Distress

CRACKING GENERALLY IN CROWN SUGGESTING INSUFICIENT BEDDING SUPPORT OR A WIDE TRENCH

Evaluation By: L. QUICK

Project No. 34 4422-00 Date: 9-6-94 Field Engineer: P. SPALDING

Site Location: M-59 STA 107+93 E.B. MDOT Designation: 63043-26069A

Beginning Point: "A" STA. 106+93

Ending Point: "B" STA. 107+93

Depth to Invert: Pipe Size: 12 IN Material: CONCRETE Flow Direction: A ← B

Video Tape No.: 2 Counter Data: 1316 – 1678 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
69 FT									JD
82-90 FT			* SEE REM.						
93 FT.		CM/Ln							

12
WEST Direction 9 ◯ 3 EAST Direction
6

Remarks:

Assessment:
Good 5 4 (3) 2 1 Poor

Evaluation:

Repair: Replace:

Probable Causes of Observed Distress
DISPLACEMENT & CRACKS SUGGEST LOSS IN BEDDING SUPPORT

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 9-4-94 Field Engineer: P. SPALDING

Site Location: M-59 STA. 131+06 MDOT Designation: 63043-26069A

Beginning Point: "A" STA 131+06

Ending Point: "B"

Depth to Invert: Pipe Size: 12 IN. Material: CONCRETE Flow Direction: A → B

Video Tape No.: 2 Counter Data: 1676-1891 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
17 FT		CF/C							
50 FT		CF/C							
66 FT									JD
78 FT									JD

12
EAST Direction 9 3 WEST Direction
6

Remarks: JOINTS DISPLACED @
66 FT – 10% ±
78 FT – 10% ±

Assessment:
Good Poor
(5) 4 3 2 1

Evaluation: PIPE IN GOOD CONDITION

Repair: Replace:

Probable Causes of Observed Distress
DISPLACED JOINTS APPEAR TO BE DAMAGE DURING CONSTRUCTION

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 8-31-94 Field Engineer: H. PRICE

Site Location: US-12 STA. 138+00 to 135+00 MDOT Designation: 81032-26455 A

Beginning Point: STA. 138+00 "A"

Ending Point: STA. 135+00 "B"

Depth to Invert: _____ Pipe Size: 15 IN Material: PVC Flow Direction: "A" → "B"

Video Tape No.: 1 Counter Data: 0747-1331 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12

SOUTH Direction 9 ◯ 3 NORTH Direction

6

Remarks: MANDREL STUCK AT 135+20. REGITERED AT STA 138+00, MANDREL STUCK AT 137+60

Assessment:

Good Poor

(5) 4 3 2 1

Evaluation: PIPE HAS SLIGHTLY OVALED APPEARANCE

Repair: _____ Replace: _____

Probable Causes of Observed Distress

PIPE DEFORMED DURING BACKFILLING

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 9-1-94 Field Engineer: P. SPALDING

Site Location: US 12 STA. 164+00 MDOT Designation: 81032-26955A

Beginning Point: "A" STA. 164+00

Ending Point: "B"

Depth to Invert: Pipe Size: 12 IN. Material: PVC Flow Direction: A → B

Video Tape No.: 1 Counter Data: 1331 – 1605 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
4FT – 20FT								D	

12

EAST Direction 9 ◯ 3 WEST Direction

6

Remarks: DIP IN GRADE ESTIMATED TO BE 1 TO 3 INCHES MANDREL PASSED ENTIRE LENGTH OF PIPE

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION DIP IN PIPE MOST LIKELY DUE TO VARIATION IN GRADE DURING INSTALLATION.

Repair: Replace:

Probable Causes of Observed Distress

SEE EVALUATION

Evaluation By: L. QUICK

Project No. 34 4422 Date: 9-1-94 Field Engineer: P. SPALDING

Site Location: US-12 STA. 170+30 MDOT Designation: 81032-26955 A

Beginning Point: "A" STA. 170+30

Ending Point: "B"

Depth to Invert: Pipe Size: 12" Material: PVC Flow Direction: A → B

Video Tape No.: 1 Counter Data: 1605-1826 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
4F7 - 44F7								D	
56F7								D	

12
WEST Direction 9 3 EAST Direction
6

Remarks: DIPS IN GRADE ESTIMATED TO BE 1 TO 3 INCHES. MANDREL PASSED ENTIRE LENGTH OF PIPE

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION. DIPS IN PIPE MOST LIKELY DUE TO VARIATION IN GRADE

Repair: Replace:

Probable Causes of Observed Distress

SEE EVALUATION

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 9-1 Field Engineer: P. SPALDING

Site Location: US-12 STA 199+95 MDOT Designation: 81032-26455A

Beginning Point: A STA. 199+95

Ending Point: B

Depth to Invert: Pipe Size: 12 IN. Material: PVC Flow Direction: A → B

Video Tape No.: 1 Counter Data: 1826-2065 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
30FT – 68FT								DP	

12

WEST Direction 9 ○ 3 EAST Direction

6

Remarks: DIP IN PIPE (30-68 FT) ESTIMATED TO BE 1-4 INCHES. MANDREL PASSED ENTIRE LENGTH OF PIPE.

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION. DIP IN PIPE MOST LIKELY DUE TO VARIATION IN GRADE DURING INSTALLATION

Repair: Replace:

Probable Causes of Observed Distress

SEE EVALUATION

Evaluation By: L. ROCK

Reviewed By: H. DRICE

Project No. 34-4422-00 Date: 9-1-94 Field Engineer: P. SPALDING

Site Location: US-12 STA 304+72 TO STA 305+30 MDOT Designation: 81032-26955A

Beginning Point: "A" - STA. 304+72

Ending Point: "B" - STA 305+30

Depth to Invert: _____ Pipe Size: 12 IN Material: PVC Flow Direction: A → B

Video Tape No.: 1 Counter Data: 2085-2231 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12
SOUTH Direction 9 ◯ 3 NORTH Direction
6

Remarks: MANDREL PASSED ENTIRE LENGTH OF PIPE

Assessment:
Good (5) 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION.

Repair: _____ Replace: _____

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Project No. 34442-00 Date: 9-1-94 Field Engineer: P. SPALDING

Site Location: US-12 MDOT Designation: 81032-26455 A

Beginning Point: "A" STA. 216+00

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN Material: CONCRETE Flow Direction: A → B

Video Tape No.: 1 Counter Data: 2251 - 2430 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12
WEST Direction 9 ◯ 3 EAST Direction
6

Remarks: WATER PRESENT IN PIPE BETWEEN 0 FT AND 60 FT. DEPTH OF WATER RANGES BETWEEN 2 AND 4 INCHES. DIP IN PIPE

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION

Repair: _____ Replace: _____

Probable Causes of Observed Distress

DIP APPEARS TO BE GRADE PROBLEM DURING INSTALLATION

Evaluation By: L. CRICK

Project No. 34-4422-00 Date: 9-7-94 Field Engineer: P. SPALDING

Site Location: M-59 STA. 393+85 W.B. MDOT Designation: 50022-05674

Beginning Point: "A"

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN. Material: PVC Flow Direction: A to B

Video Tape No.: 2 Counter Data: 1891-2020 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
46 FT								D	

12
EAST Direction 9 3 WEST Direction
6

Remarks: DIP @ 46 FT 1-2 INCHES COULD NOT MANDREL TEST DUE TO ONGOING CONSTRUCTION AT END OF PIPE.

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION. DIP IN PIPE MOST LIKELY DUE TO VARIATION IN GRADE DURING INSTALLATION.

Repair: _____ Replace: _____

Probable Causes of Observed Distress

SEE EVALUATION

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 9-7-94 Field Engineer: P. SPALDING

Site Location: M-59 STA. 465+50 W.B. MDOT Designation: 50022-05674

Beginning Point: "A"

Ending Point: "B"

Depth to Invert: Pipe Size: 12 INCH Material: PVC Flow Direction: A → B

Video Tape No.: Counter Data: 2020-2134 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
46FT									WJ

12
EAST Direction 9 ○ 3 WEST Direction
6

Remarks: MANDREL PASSED ENTIRE LENGTH OF PIPE

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION.

Repair: — Replace: —

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: _____ Field Engineer: P. SPALDING

Site Location: M-59 STA. 462+40 TO STA. 463+95 MDOT Designation: 50022-05674

Beginning Point: "A" STA 462+40

Ending Point: "B" STA. 463+95

Depth to Invert: _____ Pipe Size: 18 IN. Material: PVC Flow Direction: A ← B

Video Tape No.: 2 Counter Data: 2134-2373 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
4 FT								D 1-2"	
144 FT								D 1-2	

NORTH Direction — 12 / 9 / 3 / 6 — SOUTH Direction

Remarks: DIPS IN PIPE:
4 FT – 1-2 INCHES
144 FT – 1-2 INCHES
MANDREL PASSED ENTIRE LENGTH OF PIPE

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION. DIPS IN PIPE MOST LIKELY DUE TO VARIATION IN GRADE DURING INSTALLATION.

Repair: — Replace: —

Probable Causes of Observed Distress

SEE EVALUATION

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: _____ Field Engineer: P. SPALDING

Site Location: M-59 STA. 417+00 W.B. MDOT Designation: 50022-05674

Beginning Point: "A"

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN. Material: PVC Flow Direction: A ← B

Video Tape No.: 2 Counter Data: 2373-2499 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
33 FT								D	

12
EAST Direction 9 ◯ 3 WEST Direction
6

Remarks: DIP IN PIPE @ 33 FT 1-2 INCHES. MANDREL PASSED ENTIRE LENGTH

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION.

Repair: _____ Replace: _____

Probable Causes of Observed Distress

Dip at 33 feet PROBABLE GRADE VARIATION DURING INSTALLATION

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: _____ Field Engineer: P. SPALDING

Site Location: M-59 STA. 406+15 W.B. MDOT Designation: 50022-05674

Beginning Point: "A"

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN. Material: PVC Flow Direction: A ← B

Video Tape No.: 2 Counter Data: 2499-2613 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
51 FT								D	

12

EAST Direction 9 ◯ 3 WEST Direction

6

Remarks: DIP IN PIPE @ 51 FT. 1-2 INCHES. MANDREL TEST. MANDREL INSERTED 5 FT FROM POINT 'A' AND 10 FT. FROM POINT "B"

Assessment:

Good Poor

(5) 4 3 2 1

Evaluation: PIPE IN GOOD CONDITION. PIPE IS SLIGHTLY DEFORMED.

Repair: _____ Replace: _____

Probable Causes of Observed Distress

DEFORMATION & DIP SUGGEST LACK OF SUPPORT BY BEDDING.

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: _____ Field Engineer: P. SPALDING

Site Location: M-59 STA. 407+20 E.B. MDOT Designation: _____

Beginning Point: "A"

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN. Material: PVC Flow Direction: A ← B

Video Tape No.: 2 Counter Data: 2613-2773 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12

WEST Direction 9 ◯ 3 EAST Direction

6

Remarks: COULD NOT MANDREL AT THIS TIME DUE TO ON-GOING CONSTRUCTION

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION, VISUAL ONLY

Repair: _____ Replace: _____

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 9-7-94 Field Engineer: P. SPALDING

Site Location: M-59 STA. 426+45 MDOT Designation: 50022-05674

Beginning Point: "A"

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN. Material: PVC Flow Direction: A ← B

Video Tape No.: 2 Counter Data: 2773-2860 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12

WEST Direction 9 ◯ 3 EAST Direction

6

Remarks: COULD NOT MANDREL DUE TO ON-GOING CONSTRUCTION AT ONE END OF PIPE RUN.

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION, BASED ON VISUAL ONLY

Repair: _____ Replace: _____

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: _____ Field Engineer: P. SPALDING

Site Location: M-59 STA. 462+25 TO STA. 459+55 MDOT Designation: 50022-05674

Beginning Point: "A" STA. 462+25

Ending Point: "B" STA. 459+55

Depth to Invert: _____ Pipe Size: 24IN. Material: PVC Flow Direction: A → B

Video Tape No.: 2 Counter Data: 2860-3083 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
232FT									

SOUTH Direction — 9 — 12 — 3 — 6 — NORTH Direction

Remarks: DIP IN PIPE @ 232 FT 1-3 INCHES. PIPE COULD NOT BE CLEANED DUE TO LACK OF ACCESS FOR VAC-TRUCK. NO MANDREL TESTING AT THIS TIME.

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION. DIP IN PIPE MOST LIKELY DUE TO VARIATION IN GRADE DURING INSTALLATION.

Repair: _____ Replace: _____

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Project No. 344422-00 Date: 9-7-94 Field Engineer: L. QUICK

Site Location: M-59 STA 472+82 MDOT Designation: 50022-05674

Beginning Point: "A"

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 24 IN. Material: PVC Flow Direction: A → B

Video Tape No.: _____ Counter Data: 3097-3286 Cleaning Method: _____

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12
9 3
6
Direction Direction

Remarks: VIDEO SURVEY REQUESTED BY MDOT FIELD INSPECTOR, NO MANDREL TESTING PERFORMED.

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: _____

Repair: _____ Replace: _____

Probable Causes of Observed Distress

_____

Evaluation By: L. QUICK

Project No. 34-442200 Date: 9-8-94 Field Engineer: P. SPALDING

Site Location: M-3 STA. 263+20 TO STA. 265+57 MDOT Designation: 50051-26738A

Beginning Point: "A" STA 263+20

Ending Point: "B" STA 265+57

Depth to Invert: _____ Pipe Size: 24 IN Material: PVC Flow Direction: A → B

Video Tape No.: 2 Counter Data: 3263-3498 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
7 FT								D	
26 FT								D	
96 FT								D	
130 FT								D	
142 FT								D	
150 FT								D	

12
SOUTH Direction 9 ◯ 3 NORTH Direction
6

Remarks: COULD NOT MANDREL. TEST — MANDREL WOULD NOT FIT THROUGH MANHOLE FRAME

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: _____

Repair: _____ Replace: _____

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Project No. 344422-00 Date: 9-8-94 Field Engineer: L. QUICK

Site Location: M-3 STA. 263+20 MDOT Designation: 50051-26738A

Beginning Point: "A" STA 263+20

Ending Point: "B" STA. 265+57

Depth to Invert: _____ Pipe Size: 24 IN. Material: PVC Flow Direction: A → B

Video Tape No.: 2 Counter Data: 3263-3498 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
170FT								D	
196FT								D	
210 FT								D	
229 FT								D	

SOUTH Direction — 12 / 9 / 3 / 6 — NORTH Direction

Remarks:

Assessment:

Good 5 4 3 2 1 Poor

Evaluation:

Repair: _____ Replace: _____

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 9-8-94 Field Engineer: P. SPALDING

Site Location: M-3 STA. 141+80 TO STA. 140+90 MDOT Designation: 8' 50051-26738A

Beginning Point: "A" STA. 141+80

Ending Point: "B" STA 140+90

Depth to Invert: _____ Pipe Size: 12 IN Material: CONCRETE Flow Direction: A → B

Video Tape No.: 2 Counter Data: 4504-4678 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
6FT		CF/Tn				IE/L			
25-27FT		CF/Ln				IE/L			
31-34FT		CF/Ln				IE/L			
39 FT						IE/L			
45 FT						IE/L			
53FT						IE/L			

SOUTH Direction — 12 / 9 / 3 / 6 — NORTH Direction

Remarks: 6FT- CRACK: IE 7:00-11:00

25-27 FT LONGITUDINAL CRACK @ 6:00

31 FT IE @ 3:00

39 FT IE @ 10:00

45 FT IE @ 2:00

53 FT IE @ 10:00

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: SOME FINE CRACKING NOTED, SERVICEABLE AT PRESENT, SHOULD BE REINSPECTED IN FUTURE

Repair: _____ Replace: _____

Probable Causes of Observed Distress

CRACKS PROBABLY RELATED TO POOR BEDDING. ENCRUSTION SUGGESTS SEEPAGE, SEVERAL THROUGH PIPE WALL. SUGGEST SAND OR GRAVEL POCKETS IN PIPE

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 9-9-94 Field Engineer: P. SPALDING

Site Location: M-3 STA. 79+43 TO STA. 80+05 MDOT Designation: 50051 - 2673BA

Beginning Point: "A" STA. 79+43

Ending Point: "B" STA 80+05

Depth to Invert: _____ Pipe Size: 12 IN. Material: CONCRETE Flow Direction: A → B

Video Tape No.: 2 Counter Data: 4678-4787 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
5-7FT		CF/LN							
57-62FT								D	

NORTH Direction 9 12 3 6 SOUTH Direction

Remarks:

5-7FT LONGITUDINAL CRACK @ 12:00

57-62FT DIP IN PIPE 1-3 INCHES

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION NO REPAIR OR REPLACEMENT REQUIRED AT THIS TIME

Repair: — Replace: —

Probable Causes of Observed Distress

LONGITUDINAL PIPE CRACK PROBABLY RELATED TO BEDDING SUPPORT

Evaluation By: L. QUICK

Project No. 34:4422-00 Date: 9-9-94 Field Engineer: P. SPALDING

Site Location: M-3 STA. 55+30 TO 57+00 MDOT Designation: 50051-26738A

Beginning Point: "A" STA. 55+30

Ending Point: "B" STA. 57+00

Depth to Invert: _____ Pipe Size: 12 IN. Material: PVC Flow Direction: A ← B

Video Tape No.: 2 Counter Data: 4787-4963 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
7-10 FT								D	
22-24 FT								D	
63-66 FT								D	
110-116 FT								D	

12

NORTH Direction 9 ◯ 3 SOUTH Direction

6

Remarks: DIPS IN PIPE @

7-10 FT 1-3 INCHES

22-24 FT 1-3 INCHES

63-66 FT 1-3 INCHES

110-116 FT 1-3 INCHES

MANDREL: FROM A - 25 FT

FROM B - 35 FT

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITIONS. DIPS IN PIPE MOST LIKELY CAUSED BY GRADE VARIATION DURING INSTALLATION

Repair: _____ Replace: _____

Probable Causes of Observed Distress

PROBABLE VARIATIONS IN DENSITY OF BEDDING leading TO DIFFERENTIAL SETTLEMENT AFTER PIPE TRENCH WAS BACKFILLED

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: _____ Field Engineer: P. SPALDING

Site Location: M-3 STA. 106+70 TO STA. 104+10 MDOT Designation: 50051-26738A

Beginning Point: "A" STA. 106+70

Ending Point: "B" STA. 104+10

Depth to Invert: _____ Pipe Size: 18 IN. Material: RVC Flow Direction: A → B

Video Tape No.: 2 Counter Data: 4962-5141 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
12 FT								D	
63-64 FT								D	
129 FT *									
152-154 FT								D	

SOUTH Direction — 12 / 9 / 3 / 6 — NORTH Direction

Remarks: DIPS IN PIPE @
12 FT – 1-3 INCHES
63-64 FT – 1-3 INCHES
152-154 FT – 1-3 INCHES
* SERVICE CONNECTION @
129 FT. MANDREL: FROM A-5 FT
FROM B-58 FT

Assessment:
Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION. DIPS IN PIPE MOST LIKELY FROM VARIATION IN GRADE DURING CONSTRUCTION.

Repair: _____ Replace: _____

Probable Causes of Observed Distress
PIPE DEFORMATION INDICATED BY MANDREL SUGGESTS INSUFFICIENT LATERAL SUPPORT, PIPE DEFORMS UNDER IMPOSED LOAD

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 9-2-94 Field Engineer: P. SPALDING

Site Location: M-5/12 MILE RD STA 91+90 WB MDOT Designation: 63192-33147

Beginning Point: "A" STA 91+90

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN. Material: CONCRETE Flow Direction: A ← B

Video Tape No.: 1 Counter Data: 3505-3683 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
38FT			BR						
8FT *									JD

12

WEST Direction 9 ◯ 3 EAST Direction

6

Remarks: PIPE BROKEN @ 38 FEET APPROXIMATELY 60 % OF PIPE BLOCKED. * MOVED CAMERA TO "B" AND CONTINUED INSPECTION BACK TOWARDS BROKEN PIPE.

Assessment:

Good 5 4 (3) 2 1 Poor

Evaluation: OTHER THAN BROKEN PIPE @ 38 FT PIPE IN GOOD CONDITION

Repair: _____ Replace: BROKEN pipe SECTION @ 38FT FROM POINT "A"

Probable Causes of Observed Distress

PIPE DAMAGED DURING CONSTRUCTION

Evaluation By: L. QUICK

Project No. 34-4422.00 Date: 9-1-94 Field Engineer: P. SPALDING

Site Location: M-5/12 MILE RD STA. 91+90 W.B. MDOT Designation: 63192-33147

Beginning Point: "A" STA 91+90 W.B.

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN. Material: CONCRETE Flow Direction: B → A

Video Tape No.: 1 Counter Data: 2436-2536 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
40FT			BR/C?						

12

WEST Direction 9 ◯ 3 EAST Direction

6

Remarks:

BROKEN PIPE SECTION @ 40FT

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION OTHER THAN BROKEN PIPE

Repair: _____ Replace: REPLACE PIPE SECTION @ 40 FT.

Probable Causes of Observed Distress

Evaluation By: QUICK

Reviewed By: [illegible] PRICE

Project No. 34 4422-00 Date: 9-1-94 Field Engineer: P. SPALDING

Site Location: M-5/12 MILE RD. STA. 91+90 E.B MDOT Designation: 63192-33147

Beginning Point: "A" STA. 91+90 E.B

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN. Material: PVC Flow Direction: B → A

Video Tape No.: 1 Counter Data: 2534-2658 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
8FT-33FT								D	

12
EAST Direction 9 ◯ 3 WEST Direction
6

Remarks: DIP IN PIPE BETWEEN 8 AND 33 FT. ESTIMATED TO BE 1 TO 2 INCHES. GOOD DEAL OF SAND IN CATCH BASIN @ "B" MANDREL PENETRATED ONLY 8 FT. FROM PT "A"

Assessment:

Good Poor
(5) 4 3 2 1

Evaluation: PIPE IN GOOD CONDITION

Repair: _____ Replace: _____

Probable Causes of Observed Distress

DIP APPEARS TO BE COMBINATION GRADE AND SETTLEMENT OF BEDDING

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 4-1-94 Field Engineer: P. SPALDING

Site Location: M-5/12 MILE RD STA. 91+90 TO 90+25 MDOT Designation: 63192-33147

Beginning Point: "A" STA 91+90

Ending Point: "B" STA 90+25

Depth to Invert: _____ Pipe Size: 15 Material: CONCRETE Flow Direction: A → B

Video Tape No.: 1 Counter Data: 2658-2876 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
142 FT		CF/LN							
143 FT		CF/CM C							

SOUTH Direction — 12 / 9 / 3 / 6 — NORTH Direction

Remarks:

142 FT LN CRACK @ 1:00

143 F C CRACK "

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION

Repair: _____ Replace: _____

Probable Causes of Observed Distress

CRACKS APPEAR TO BE LOCALIZED OVERSTRESS

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 9-2-94 Field Engineer: P. SPALDING

Site Location: M-5/12 MILE RD STA. 99+75 W.B. MDOT Designation: 63192-33147

Beginning Point: "A" STA. 99+75 W.B.

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN. Material: CONCRETE Flow Direction: B → A

Video Tape No.: 1 Counter Data: 2871-2961 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12
WEST Direction 9 ◯ 3 EAST Direction
6

Remarks:

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION NO DEFECTS WERE OBSERVED

Repair: _____ Replace: _____

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Reviewed By: H. PRICE

FIGURE NO. 6-11 Sheet 1 of 1

Project No. 34-4422-00 Date: 9-2-94 Field Engineer: P. SPALDING

Site Location: M-5/12 MILE RD STA 99+75 E.B. MDOT Designation: 63192-33147

Beginning Point: "A" STA. 99+75 E.B.

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN. Material: PVC Flow Direction: B → A

Video Tape No.: 1 Counter Data: 2961-3058 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12
EAST Direction 9 ◯ 3 WEST Direction
6

Remarks: MANDREL PASSED ENTIRE LENGTH OF PIPE

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION

Repair: _____ Replace: _____

Probable Causes of Observed Distress

Evaluation By: QUICK

Project No. 344422.00 Date: 9-2-94 Field Engineer: P. SPALDING

Site Location: M-5/12 MILE RD STA 99+70 MDOT Designation: 63192-33147

Beginning Point: "A" STA. 99+70

Ending Point: "B" STA 102+25

Depth to Invert: _____ Pipe Size: 15 IN Material: PVC Flow Direction: A → B

Video Tape No.: 1 Counter Data: 3058-3343 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
6 FT								D	
22 FT								D	
55 FT								D	
77 FT								D	
114 FT								D	
152 FT								D	

12
NORTH Direction 9 ◯ 3 SOUTH Direction
6

Remarks: DIPS IN PIPE AT 6FT, 22FT, 55FT, 77FT, 114FT 152FT MANDREL ONLY ABLE TO PENETRATE 5FT FROM POINT "A" AND 5 FT FROM POINT "B"

Assessment:
Good 5 (4) 3 2 Poor 1

Evaluation: _____

Repair: _____ Replace: _____

Probable Causes of Observed Distress

DIPS APPEAR TO BE A COMBINATION OF GRADE PROBLEMS DURING INSTALLATION AND SETTLEMENT OF BEDDING

Evaluation By: L. QUICK

Reviewed By: L. DUCE

Project No. 34 4422-00 Date: 9-2-94 Field Engineer: P. SPALDING

Site Location: M-5/12 MILE RD STA. " MDOT Designation: 63192-33147

Beginning Point: "A" STA. 99+70

Ending Point: "B" STA 102+25

Depth to Invert: _____ Pipe Size: 12 IN. Material: PVC Flow Direction: A → B

Video Tape No.: 1 Counter Data: 3058-3343 Cleaning Method: _____

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
190-247 FT					SEE REM.				

NORTH Direction — 12 / 9 / 3 / 6 — SOUTH Direction

Remarks: 190-200 FT. ACCUMULATION OF WHAT APPEARS TO BE SAND ALONG PIPE BETWEEN 6:00 AND 8:00. VOLUME OF DEBRIS VARIES DEPENDING ON LOCATION.

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: DIPS TRAP SAND

Repair: _____ Replace: _____

Probable Causes of Observed Distress

Evaluation By: L. WICK

Reviewed By: H. PRICE

Project No. 34-4422-00 Date: 9-2-94 Field Engineer: P SPALDING

Site Location: M-5 / 12 MILE RD STA. 113+45 MDOT Designation: 63192-33147

Beginning Point: "A" STA 113+45

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN. Material: CONCRETE Flow Direction: A → B

Video Tape No.: 1 Counter Data: _____ Cleaning Method: _____

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
19 FT									JO
40 FT									JO
48 FT								H	

WEST Direction — 12 / 9 / 3 / 6 — EAST Direction

Remarks: OPEN JOINTS
19 FT 2-3 INCHES WIDE
40 FT 1-2 INCHES
48 FT HEAVE 2-4 INCHES.
MANDREL ABLE TO PENETRATE
5 FT FROM "A" AND 39 FT FROM "B"

Assessment:
Good 5 (4) 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION. SOME DEFLECTION NOTED BASED ON MANDREL TESTING.

Repair: _____ Replace: _____

Probable Causes of Observed Distress
OPEN JOINTS & DISTORTION ARE PROBABLY RELATED TO THE ORIGINAL CONSTRUCTION

Evaluation By: L. CUICK

Project No. 34-4422-00 Date: 9-2-94 Field Engineer: P. SPALDING

Site Location: M-5/12 MILE RD STA 99+75 E.B. MDOT Designation: 63192-33147

Beginning Point: "A" STA. 99+75 E.B.

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN. Material: PVC Flow Direction: B → A

Video Tape No.: 1 Counter Data: 2961-3058 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12

EAST Direction 9 ◯ 3 WEST Direction

6

Remarks: MANDREL PASSED ENTIRE LENGTH OF PIPE

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION

Repair: _____ Replace: _____

Probable Causes of Observed Distress

Evaluation By: E. QUICK

Project No. 34-4422-00 Date: 9-2-94 Field Engineer: P. SPALDING

Site Location: M-5/12 MILE RD STA 116+40 WFS MDOT Designation: 63192-33147

Beginning Point: "A" STA 116+40

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN Material: CONCRETE Flow Direction: A ← B

Video Tape No.: 1 Counter Data: 3425-3505 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
23									JO

12
WEST Direction 9 ◯ 3 EAST Direction
6

Remarks:

23 FT - JOINT OPEN 1-2 INCHES ±

Assessment:

Good Poor
(5) 4 3 2 1

Evaluation: PIPE IN GOOD CONDITION

Repair: _____ Replace: _____

Probable Causes of Observed Distress

OPEN JOINT APPEARS TO BE THE RESULT OF THE GEOMETRY OF THE JOINT RATHER THAN A DEFECT

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 9-2 Field Engineer: P. SPALDING

Site Location: M-5/12 MILE EXD STA 116+40 EB MDOT Designation: 63192-33147

Beginning Point: "A" STA 116+40

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN Material: PVC Flow Direction: A → B

Video Tape No.: 1 Counter Data: 3683 - 3755 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12
EAST Direction 9 ◯ 3 WEST Direction
6

Remarks: MANDREL ABLE TO PENETRATE 25FT FROM POINT "A" NOTE CONCRETE AT BOTTOM OF CATCH BASIN ("B")

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION, SOME DEFORMATION INDICATED BY MANDREL TEST

Repair: _____ Replace: _____

Probable Causes of Observed Distress

DISTORTION OF PIPE MOST PROBABLY OCCURRED DURING INSTALLATION

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 9-2-94 Field Engineer: P. SPALDING

Site Location: M-5/12 MILE RD STA. 113+45 WB MDOT Designation: 63192-33147

Beginning Point: "A" STA 113+45

Ending Point: "B"

Depth to Invert: _____ Pipe Size: 12 IN. Material: CONCRETE Flow Direction: A ← B

Video Tape No.: 1 Counter Data: 3543-3425 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
32 FT									JD 5%

WEST Direction — 9 — 12 — 3 — 6 — EAST Direction

Remarks:

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION

Repair: _____ Replace: _____

Probable Causes of Observed Distress

JOINT DISPLACEMENT APPEARS TO BE CAUSED BY VARIATIONS IN PIPE SECTIONS

Evaluation By: L. DICK

Project No. 34-4422-00 Date: 9-8-94 Field Engineer: P. SPALDING

Site Location: M-3 STA. 218+10 TO STA. 219+30 MDOT Designation: 50052-26738A

Beginning Point: "A" STA. 218+10

Ending Point: "B" STA 220+05

Depth to Invert: Pipe Size: 12 IN. Material: CMP Flow Direction: A → B

Video Tape No.: 2 Counter Data: 3498-3790 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12
SOUTH Direction 9 ◯ 3 NORTH Direction
6

Remarks:

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: CMP IN GOOD CONDITION - NO REPAIR OR REPLACEMENT REQUIRED AT THIS TIME

Repair: Replace:

Probable Causes of Observed Distress

Evaluation By: J. QUICK

Project No. 34422-00 Date: 9-8-94 Field Engineer: P. SPALDING

Site Location: M-3 STA. 224+10 TO STA. 226+20 MDOT Designation: 50052-26738A

Beginning Point: "A" STA. 224+10

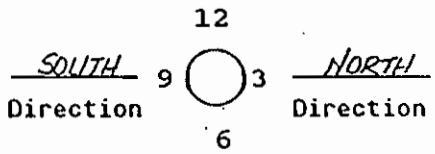
Ending Point: "B" STA. 226+20

Depth to Invert: _____ Pipe Size: 12 IN. Material: CONCRETE Flow Direction: A → B

Video Tape No.: 2 Counter Data: 3790 - 4274 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
4 FT								D	JO
8 FT		CF/C							
12 FT		CF/C							
12 FT		CF/Ln							
16 FT						IE/L			
17 FT						IE/L			



Remarks:

4 FT - JOINT OFFSET 5-10%

- DIP IN PIPE: 1-2 INCHES

12 FT - LONGITUDINAL CRACK - 2:00

16 FT IE/L @ 11:00

17 FT IE/L @ 12:00

Assessment:

Good 5 4 (3) 2 1 Poor

Evaluation: CONCRETE SECTION OF PIPE IN GOOD CONDITION. CMP IN FAIR TO POOR CONDITION, HOLES IN (CONT. SHT. 2)

Repair: — Replace: REPLACEMENT RECOMMENDED

Probable Causes of Observed Distress

DAMAGE TO CMP PROBABLY BUCKET DAMAGE DURING INSTALLATION.

LONGITUDINAL CRACKS IN RCP RELATED TO FOUNDING

Evaluation By: L. QUICK

Project No. 34-4422.00 Date: 9-8-94 Field Engineer: P. SPALDING

Site Location: M-3 STA 224+10 TO STA 236+20 MDOT Designation: 50052-26738A

Beginning Point: 'A' STA 224+10

Ending Point: 'B' STA 236+20

Depth to Invert: _____ Pipe Size: 12 IN Material: CONCRETE Flow Direction: A → B

Video Tape No.: 2 Counter Data: _____ Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
23 FT		CF/C							
28 FT		CM/L				IE/L			

SOUTH Direction — 12 / 9 / 3 / 6 — NORTH Direction

Remarks: 28FT LONGITUDINAL CRACK-8:00

28FT IE/L @ 2:00 & 8:00

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: CMP @ 56 AND 60 FT. MOST LIKELY OCCURED DURING INSTALLATION. THIS SECTION OF THE PIPE SHOULD BE REPAIRED OR REPLACED

Repair: _____ Replace: _____

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Project No. 34-442200 Date: 9-8-94 Field Engineer: P. SPALDING

Site Location: M-3 STA. 224+10 TO STA 226+20 MDOT Designation: 50052-2673BA

Beginning Point: "A" STA 224+10

Ending Point: "B" STA 226+20

Depth to Invert: _____ Pipe Size: 12 IN Material: CONCRETE Flow Direction: A ⟶ B

Video Tape No.: 2 Counter Data: 3790-4274 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
39 FT		CF/Ln							
40-43FT		CF/Ln							
46 FT									JO 10%
56 FT			*						
60 FT			*						
164 FT									JO 10%

12

SOUTH Direction 9 ○ 3 NORTH Direction

6

Remarks: 40FT - LONGITUDINAL CRACK - 3:00

46 FT - PIPE CHANGES TO CMP

JOINT OFFSET 5-10%

*56FT - HOLE IN PIPE @ 10:00

*60 FT - HOLE IN PIPE @ 11:00

164 - PIPE CHANGES BACK TO CONCRETE.

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: _____

Repair: _____ Replace: _____

Probable Causes of Observed Distress

_____

Evaluation By: L QUICK

Project No. 34-4422-00 Date: 9-8-94 Field Engineer: P. SPALDING

Site Location: M-3 STA. 224 TO STA. 226+20 MDOT Designation: 50052-26738 A

Beginning Point: "A" 224+10

Ending Point: "B" 226+20

Depth to Invert: _____ Pipe Size: 12 IN. Material: CONCRETE Flow Direction: A → B

Video Tape No.: 2 Counter Data: 3790-4274 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
174 FT								D	
183 FT		CF/Ln							
185 FT		CF/Ln							
194 FT		CF/Ln							JO 2 IN.
200 FT									JO 2 IN.
207 FT									JO 2-3 IN.

SOUTH Direction — 12 / 9 / 3 / 6 — NORTH Direction

Remarks: 174 FT - DIP IN PIPE 1-3 INCHES
183 FT - LONGITUDINAL CRACK @ 12:00
185 FT - LONGITUDINAL CRACK @ 1:00
194 FT - LONGITUDINAL CRACK @ 7:00 9:00

Assessment:

Good 5 4 (3) 2 1 Poor

Evaluation: _____

Repair: _____ Replace: _____

Probable Causes of Observed Distress

_____

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: _____ Field Engineer: P. SPALDING

Site Location: M-3 STA. 248+19 to STA. 249+70 MDOT Designation: 50052-26738A

Beginning Point: "A" STA. 248+19

Ending Point: "B" STA. 249+70

Depth to Invert: _____ Pipe Size: 12 IN. Material: CMP Flow Direction: A → B

Video Tape No.: 2 Counter Data: 4274-4504 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
4FT									JO
38FT							DR 3-6"		
110 FT									JD 5-10%
109-112 FT								H	
122-124 FT								D	
136-141 FT								D	

12
SOUTH Direction 9 ◯ 3 NORTH Direction
6

Remarks:

4FT JOINT OPEN PVC SLEEVE

SOME SOIL INFLOW

109-112 FT HEAVE IN PIPE 2-4 INCHES

122-124 FT DIP IN PIPE 1-3 INCHES

136-141 FT DIP IN PIPE 1-3 INCHES

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: CMP IN FAIR TO GOOD CONDITION. REPAIR OPEN JOINT AT 4 FT.

Repair: REPAIR OPEN JT. @ 4FT Replace: _____

Probable Causes of Observed Distress

PRESENCE OF PVC SLEEVE SUGGESTS POSSIBLE CONSTRUCTION ERROR

Evaluation By: L. QUICK

Project No. 34-4422-00 Date: 8-31-94 Field Engineer: H. PRICE

Site Location: I-94 / MERRIMAN INTERCHANGE MDOT Designation: 82022-25576 A

Beginning Point: RAMP G MERRIMAN ROAD "A"

Ending Point: STATION 233+40 "B".

Depth to Invert: _____ Pipe Size: 18IN. Material: CONCRETE Flow Direction: "A" → "B"

Video Tape No.: 1 Counter Data: 0000-0262 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12
SOUTH Direction 9 ◯ 3 NORTH Direction
6

Remarks: PIPE IN GOOD CONDITION, SOME MINOR CRAZING PRESENT AT SCATTERED LOCATIONS.

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION

Repair: _____ Replace: _____

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Reviewed By: _____

Project No. 34 4422-00 Date: 8-31-94 Field Engineer: H. PRICE

Site Location: I-94/MERRIMAN STATION 236+40 RAMP D MDOT Designation: 82022-25576A

Beginning Point: "A"

Ending Point: "B"

Depth to Invert: Pipe Size: 15 IN Material: CONCRETE Flow Direction: "A" → "B"

Video Tape No.: 1 Counter Data: 0446 – 0797 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
3 FT.		CF/CM Ln.							
10		CF/CM Ln							
12		CF/CM Ln							
31		CF/CM Ln							
40		CF/CM Ln							
43		CF/CM Ln							

12

EAST Direction 9 ◯ 3 WEST Direction

6

Remarks: CRACKS @ FOLLOWING LOCATIONS:

3 FT – 12:00	43 FT – 12:00
10 FT – 4:00	– 8:00
12 FT – 4:00	59 FT 8:00
31 FT – RADIAL	64 FT – 4:00
40 FT – RADIAL	8:00

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: PIPE IN FAIR TO GOOD CONDITION.

Repair: Replace:

Probable Causes of Observed Distress

LOCALIZED OVERSTRESSING & LACK OF BEDDING SUPPORT

Evaluation By: L. QUICK

Project No. 34 4422-00 Date: 8-31-94 Field Engineer: H. PRICE

Site Location: I-94 MUKEMAN STA. 336+40 RAMP D MDOT Designation: 82022-25576 A

Beginning Point: "A"

Ending Point: "B"

Depth to Invert: Pipe Size: 15 IN. Material: CONCRETE Flow Direction: "A" → "B"

Video Tape No.: 1 Counter Data: 0446-0797 Cleaning Method: WATER JET

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
59		CF/CM							
64		CF/CM							

12

EAST Direction 9 ◯ 3 WEST Direction

6

Remarks:

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: PIPE IN FAIR TO GOOD CONDITION

Repair: Replace:

Probable Causes of Observed Distress

LOCALIZED AREAS OF OVERSTRESS, POSSIBLE LOSS OF BEDDING SUPPORT

Evaluation By: L. QUICK

APPENDIX B

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-6-94 Reference No.: 00020
Client: MDOT
Job. No.: 522-496 Area:
Job Location: US-34

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 000 - 024
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0+57 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT: 4 | 1 / 3 | 2

Sta #276+35

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						MH A.							
0+57						MH B.							

NOTES: Conc. at End of Line on Bottom

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

APPROVED BY: P. SPAONE

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-6-94 Reference No.: 00021
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: U.S.-24

LINE VIDEO INSPECTION REPORT

Inspector: Q	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 18" Pipe Condition: G	Counter Location: 0261 – 0550
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0456 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 280+40

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0100						A							
0441						C.P.L.							
0456						B.							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: P. SPALDING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-6-94 Reference No.: 00022
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: US-24

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 0550 – 0746
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0650 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta # 343+26

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0700						A							
0410						C.P.L.							
0650						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Heavy Conc. at Botte of C.B.

APPROVED BY: P. SPALDING

SECTION 1-3

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-6-94 Reference No.: 60023
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: US-24

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 15" Pipe Condition:	Counter Location: 0746 - 0981
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← (Circle One)

TOTAL DISTANCE: 0193 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT: 4 1 / 3 2

Sta# 412+40 Sta# 413+40

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
~~000~~						~~[illegible]~~							
012						CPL							
097						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: P. SPALDING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-6-94 Reference No.: 00024
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: M-59

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 18" Pipe Condition: G	Counter Location: 0981 — 1310
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A — DIRECTION OF MEASUREMENT ← → (Circle One) — "B" MANHOLE NO. B

TOTAL DISTANCE: 1467 (Circle One)

DIRECTION OF FLOW ← →

QUADRANT: 4 | 1 / 3 | 2

Sta # 67+00 Sta # 68+70

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
040						C.P.L.							
070						W.J.							
407						C.P.L.							
425						C.P.L.							
467						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: P. SPALDING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-6-94 Reference No.: 00025
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: M-59

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 1310 - 1678
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0+99 (Circle One)

DIRECTION OF FLOW ← → (Circle One)

"B" MANHOLE NO. B

QUADRANT: 4 | 1 | 3 | 2

Stat 106+93

DISTANCE READING	QUADRANT 1	2	3	4	SC	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	SC	CODE/REMARKS
0+00						A							
0+21	X					C.P.L. O.J.							
0+46						C.P.R.							
0+54						C.P.R.							
0+59						C.P.L.							
0+62						C.P.R.							
0+64						C.P.L.							
0+69						O.J.							
0+93	X					C.P.L.							
0+99						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Conc. on Bottom

APPROVED BY: P. SPALDING

SECTION 2-2

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-6-94 Reference No.: 00026
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: M-59

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 1676 – 1891
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0493 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 131406

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0403						A							
0478						C.P.R.							
0450						C.P.R.							
0466						O.J.							
0478						O.J.							
0493						R.							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Artest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: P. SPALDING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 8-31-94 Reference No.: 0004
Client: M-Dot
Job. No.: 522- Area:
Job Location: Mich. AVE.

LINE VIDEO INSPECTION REPORT

Inspector: S	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 15" Pipe Condition:	Counter Location: 0797 — 1331
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Slip	Remarks: From Line
Remarks:	

"A" MANHOLE NO. 138-00 — DIRECTION OF MEASUREMENT ← → (Circle One) — TOTAL DISTANCE: (Circle One) — DIRECTION OF FLOW ← → — "B" MANHOLE NO. 135-00

QUADRANT: 1, 2, 3, 4

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						M.H. 138-00							
3406						M.H. 135-00							

NOTES: Mandrell - ASTM OK
MDOT NG

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

APPROVED BY:

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-1-94 Reference No.: 0005
Client: Mo Dot
Job. No.: 522-496 Area:
Job Location: Mich. AVE.

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 12" Pipe Condition:	Counter Location: 1331 ~~[illegible]~~ - 1605
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A — DIRECTION OF MEASUREMENT ← → (Circle One) — "B" MANHOLE NO. B

TOTAL DISTANCE: 65' (Circle One)

DIRECTION OF FLOW ← → (Circle One)

QUADRANT: 4 | 1 / 3 | 2

Sta#164+00

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
0+04	-	20'				D.P.							
0+65						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Mandrell - OK

APPROVED BY: [signature]

SECTION 3-2

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-1-94 Reference No.: 0006
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: Mich AVE.

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 12" Pipe Condition:	Counter Location: 1605 - 1826
Type of Pipe: PVC	Client Requests Copy: ☐ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0467 (Circle One)

DIRECTION OF FLOW ← → (Circle One)

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 170+30

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0100						A							
0104 - 454						D.P.							
0456						D.P.							
0467						B							

NOTES: Mandrell - OK

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

APPROVED BY: [signature]

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-1-94 Reference No.: 5007
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: Mich AVE.

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G, "B"- G	V.H.S. Tape No.: 1
Pipe Size: 12" Pipe Condition: P.	Counter Location: 1826 — 2085
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 72' (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 199-195

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
030	—		68'			D.P.							
072						B.							

NOTES: Mandrell - OK

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

APPROVED BY:

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-1-94 Reference No.: 6008
Client: M-Dot
Job. No.: 522-4096 Area:
Job Location: Mich AVE.

LINE VIDEO INSPECTION REPORT

Inspector:	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 12" Pipe Condition:	Counter Location: 2085 — 2231
Type of Pipe: PVC.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A — DIRECTION OF MEASUREMENT ← → (Circle One) — "B" MANHOLE NO. B

TOTAL DISTANCE: 469' (Circle One)

DIRECTION OF FLOW ← → (Circle One)

QUADRANT: 4 | 1 / 3 | 2

Sta# 304+72 — Sta# 305+30

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
469						B							

NOTES: Mandrell - OK

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

APPROVED BY: [signature]

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-1-94 Reference No.: 0008
Client: M-Dot
Job. No.: 522496 Area:
Job Location: Mich AVE.

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 18" Pipe Condition:	Counter Location: 2231 – 2436
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks: Storm Line
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← (Circle One) →

TOTAL DISTANCE: 0476' (Circle One)

DIRECTION OF FLOW ← (Circle One) →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta#216+00

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
0476						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY:

SECTION 3-6

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-7-94 Reference No.: 00027
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: M-59

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 1891 - 2020
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0652 (Circle One)

DIRECTION OF FLOW ← → (Circle One)

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta#393+85 WB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0400													
0446						Dip.							
0652						B.							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: COULD NOT MANDREL - ONLY ONE OPENING IN LINE DUE TO TEMPORARY ROAD.

APPROVED BY: P. SPALDING

SECTION 4-1

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-7-94 Reference No.: 00028
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: M-59

LINE VIDEO INSPECTION REPORT

Inspector: —	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 2020 — 2134
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0053 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta#455+50 WB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0000						A							
0146						W.J.							
0153						B							

NOTES: mandrell - ok

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

APPROVED BY: P. SPALDING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-7-94 Reference No.: 00029
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: M-59

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 18" Pipe Condition: G	Counter Location: 2134 – 2373
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← (Circle One) →

TOTAL DISTANCE: 453 (Circle One)

DIRECTION OF FLOW ← (Circle One) →

"B" MANHOLE NO. B

QUADRANT: 4 | 1 / 3 | 2

Sta# 462+40 W.B. Sta# 453+95

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
0+04						D.P.							
4+44						D.P.							
4+53						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Mandrell – OK

APPROVED BY: P. SPALDING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-7-94 Reference No.: 00030
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: M-59

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 2373 - 2499
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0453 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

sta # 417+00 W.B.

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0400						A							
0433						D.P.							
0453						B							

NOTES: Mandrell-ok

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

APPROVED BY: P. SMALDING

S221009. NTH CONSULTING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-7-94 Reference No.: 00030
Client: M-Dot
Job. No.: 522-[illegible] Area:
Job Location: M-59

LINE VIDEO INSPECTION REPORT

Inspector: B	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 2499 – 2613
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0455 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 406+15 W.B.

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0-00						A							
0451						D.P.							
0455						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Mandrell – 10' from B
5' from A

APPROVED BY: P. SPAWING

SECTION 4-5

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-7-94 Reference No.: 00032
Client: Mo Dot
Job. No.: 522-1009 Area:
Job Location: M-59

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 2613 - 2773
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0465 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta #4 07+20 E.B.

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
0465						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Can't Mandrell at this time - one MH only - Construction

APPROVED BY: P. Spalding

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-7-94 Reference No.: 00037
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-59

LINE VIDEO INSPECTION REPORT

Inspector: O	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 2773 – 2860
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0451 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta#426+85

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0000						A							
0451						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Can't Mandrell
No access – construction
SECOND

APPROVED BY: P. SPALDING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-7-94 Reference No.: 000344
Client: M-Dot
Job. No.: 582-1009 Area:
Job Location: M-59

LINE VIDEO INSPECTION REPORT

Inspector:	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 24" Pipe Condition: G	Counter Location: 2P50 — 30P3
Type of Pipe: PVC.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 2+62 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 462+25 ER Sta# 459+55

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
2+32						D.P.							
2+62						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Needs Cleaning No access at this Time
VAC-TRUCK . NO MANDRELL

APPROVED BY: R. SPALDING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-7-94 Reference No.: 60035
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-59

LINE VIDEO INSPECTION REPORT

Inspector: S	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 24" Pipe Condition:	Counter Location: — 3286
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 2650 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

JOB # 472482

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
2+50						B-							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Artiest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: VIDEO SURVEY ONLY REQUESTED BY MDOT FIELD INSPECTOR MARK (~~B.S.~~ STUCKER). OK'd BY HRP

APPROVED BY: P. SPALDING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-8-94 Reference No.: 00036
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-3 North

LINE VIDEO INSPECTION REPORT

Inspector: B	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 24" Pipe Condition: G	Counter Location: 3263 – 3498
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A — DIRECTION OF MEASUREMENT ← → (Circle One) — "B" MANHOLE NO. B

TOTAL DISTANCE: 2435 (Circle One)

DIRECTION OF FLOW ← →

QUADRANT: 4 | 1 / 3 | 2

Sta # 263+20 — Sta # 265+57

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
0+07						D.P.							
0+26						D.P.							
0+96						D.P.							
1+30						D.P.							
1+42						D.P.							
1+50						D.P.							
1+70						D.P.							
1+96						D.P.							
2+10						D.P.							
2+29						D.P.							
2+35						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Mandrell - Will Not Fit thru M.H.

APPROVED BY: P. SPALDING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-8-94 Reference No.: 00039
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-3 North

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 4504 – 4678
Type of Pipe: Conc.	Client Requests Copy: ☑ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0480 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 140+80 Sta# 140+90

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0000						A							
0406						C.P.R.							
0425						C.P.L.							
0431						C.P.L.							
0452						C.P.L.							
0461						C.P.R. C.P.L.							
0480						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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Date: 9-9-94 Reference No.: 00045
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-3 North

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 4678 – 4787
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← (Circle One) →

TOTAL DISTANCE: 0+68

DIRECTION OF FLOW ← (Circle One) →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 79+43 Sta# 80+05

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
0+05						C.P.L.							
0+62						D.P.							
0+68						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: P. SPADING

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Date: 9-9-94 Reference No.: 00041
Client: M-Dot
Job. No.: T22-1009 Area:
Job Location: M-3 North

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 4887 – 4963
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. X — DIRECTION OF MEASUREMENT ← → (Circle One) — TOTAL DISTANCE: 1470 — DIRECTION OF FLOW ← → (Circle One) — "B" MANHOLE NO. B

QUADRANT: 4 | 1 / 3 | 2

Sta# 55430 Sta# 57400

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
007						D.P.							
022						D.P.							
043						D.P.							
063						D.P.							
1410						D.P.							
1470						B							

NOTES: Mandrell – from B13'
from A-25'

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

APPROVED BY: P. SPALDING

Screen Fail

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-9-94 Reference No.: 00042
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-3 North

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Tim W.
Manhole Condition: "A"- G "B"- G.	V.H.S. Tape No.: 2
Pipe Size: 8" Pipe Condition: G.	Counter Location: 4962 — 5141
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 2453 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 106470 Sta# 104410

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
0+12						D.P.							
0+63						D.P.							
1+29					X								
1+53						D.P.							
2+53						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Mandrell — ~~B~~ from B-5 from A-5'

APPROVED BY: P. SPALDING

Section 5-5

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
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800•992•9118

Date: 9-1-94 Reference No.: 0009
Client: M-Dot
Job. No.: 522-896 Area:
Job Location: 12 Mile

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 12" Pipe Condition:	Counter Location: 2436 – 2536
Type of Pipe: Conc	Client Requests Copy: ☑ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A — DIRECTION OF MEASUREMENT ← → (Circle One) — "B" MANHOLE NO. B

TOTAL DISTANCE: 0440' (Circle One)

DIRECTION OF FLOW ← →

QUADRANT: 4 | 1 / 3 | 2

Sta#91+90 WB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0100						A							
0440						C.B. POSSIBLE CATCH BASIN OR BROKEN PIPE							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY:

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
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800•992•9118

Date: 9-2-94 Reference No.: 00017
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: 12 Mile

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: ~~3505~~ 1
Pipe Size: 12" Pipe Condition: G	Counter Location: 3505 — 3683
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 683 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 98+90 WB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
683						B.P.							
000						B Reverse Setup							
000						O.J.							
683						B.P.							

NOTES: 78' Total Line

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

APPROVED BY:

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Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-1-94 Reference No.: 00010
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: 12 Mile

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim L
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 12" Pipe Condition:	Counter Location: 2534 — 2658
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0451' (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta # 91+90 EB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0400						A							
0408	—	33'				D.P							
0451						B.							

NOTES: Mandrell — No Gr

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

APPROVED BY: [signature]

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
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800•992•9118

Date: 9-1-94 Reference No.: 00011
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: 12 Mile

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 15" Pipe Condition:	Counter Location: 2658 – 2876
Type of Pipe: Conc.	Client Requests Copy: ☐ Yes ☐ No
Type of Joint: O-Ring	Remarks: Storm
Remarks:	

"A" MANHOLE NO. 4 — DIRECTION OF MEASUREMENT ← → (Circle One) — "B" MANHOLE NO. B

TOTAL DISTANCE: 461' (Circle One)

DIRECTION OF FLOW ← → (Circle One)

QUADRANT: 4 | 1 / 3 | 2

Sta # 91+90 Sta # 90+25

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
442						CPL							
443						CPR							
461						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: [signature]

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-2-9X Reference No.: 00012
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: 12 Mile

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G. "B"- G	V.H.S. Tape No.: 1
Pipe Size: 12" Pipe Condition: G.	Counter Location: 2971 – 2961
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0653 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta # 99+75 W.B.

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0400						A							
0653						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY:

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-2-94 Reference No.: 00013
Client: MI-DOT
Job. No.: 522-496 Area:
Job Location: 12 Mile

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 12" Pipe Condition: G	Counter Location: [illegible] — 3058
Type of Pipe: PVC.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0452 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 9947 S.E.R.

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0400						A							
0452						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Mandrell — OK 58'

APPROVED BY: [signature]

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
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800•992•9118

Date: 9-2-94 Reference No.: 20014
Client: M-Dot
Job. No.: 522-486 Area:
Job Location: 12 Mile

LINE VIDEO INSPECTION REPORT

Inspector:	Job Foreman: Jim W
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 15" Pipe Condition: G	Counter Location: 3058 — 3348
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A — DIRECTION OF MEASUREMENT ← (Circle One) → "B" MANHOLE NO. B

TOTAL DISTANCE: 2+47 (Circle One)

DIRECTION OF FLOW ← (Circle One) →

QUADRANT: 4 | 1 / 3 | 2

Sta# 99+76 Sta# 102+25

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
0+06						D.P.							
0+22						D.P.							
~~0+33~~						~~D.P.~~							
0+55						D.P.							
0+77						D.P.							
1+14						D.P.							
1+52						D.P.							
2+00						Dirt							
2+47						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Mandrell - Not G 10'

APPROVED BY:

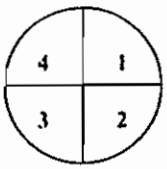
: 9-2-94 Reference No.: 00015
n. M-Dot
No.: 522-496 Area:
Location: 12 Mile

CTION REPORT

Foreman: Jim W.
H.S. Tape No.: 1
unter Location: 3343 — 3425
ent Requests Copy: ☒ Yes ☐ No
marks:

"B" MANHOLE NO. B

QUADRANT



CE ANG	QUADRANT 1	2	3	4	S C	CODE/REMARKS

S:

OVED BY:

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Detroit, Michigan 48217
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800•992•9118

Date: 9-2-94 Reference No.: 00016
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: 12 Mile

LINE VIDEO INSPECTION REPORT

Inspector: —	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 12" Pipe Condition: G	Counter Location: 3425 — 3505
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0438 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

SB#116+40 WB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0400						A							
0423						W.J.							
0438						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Artest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY:

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Detroit, Michigan 48217
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800•992•9118

Date: 9-2-94 Reference No.: 00018
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: 12 Mile

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 12" Pipe Condition: G	Counter Location: 3688 — 3755
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0638 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Start 116+40 EB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0000						A							
0638						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Mandrell — OK
25

APPROVED BY:

Inland Waters Pollution Control, Inc.
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Date: 9-2-94 Reference No.: 00019
Client: M-Dot
Job. No.: 522-496 Area:
Job Location: 13 Mile

LINE VIDEO INSPECTION REPORT

Inspector: B.	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 12" Pipe Condition: G	Counter Location: 3755 – 3837
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0+50 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 113+45 EB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
0+19						W.J.							
0+40						W.J.							
0+50						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Mandrell - No Go
Total Mandrell 44

APPROVED BY: [signature]

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-D-94 Reference No.: 00037
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-3 North

LINE VIDEO INSPECTION REPORT

Inspector:	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 10" Pipe Condition: G	Counter Location: 3498 – 3790
Type of Pipe: Cg/1	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Weld	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 1495 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 218+18 Sta# 219+30

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
1495						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: P. SPALDING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-8-94 Reference No.: 00037A
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-3 North

LINE VIDEO INSPECTION REPORT

Inspector:	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 3790 – 4274
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 2412 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 22410 Sta# 22620

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0100						A	1494						W.J. C.P.L.
0104						W.J. D.P.	2400						W.J.
0108						C.P.R.	2407						W.J.
0112						C.P.R. C.P.L.	2412						B
0123						C.P.R.							
0128						C.P.L.							
0139						C.P.L.							
0140						C.P.L.							
0145			O.J.			W.J. Gal. pipe							
0156				X		hole in pipe							
0160				X		hole in pipe							
1664			O.J.			Back to Conc.							
1704						D.P.							
1893	X			X		C.P.L.							
1895						C.P.L.							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: P. SPALDING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-8-94 Reference No.: 00038
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-3 North

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 2
Pipe Size: 12" Pipe Condition: G	Counter Location: 4274 – 4504
Type of Pipe: ~~Gla~~ Gal.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Weld	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 1+51 (Circle One)

DIRECTION OF FLOW ← → (Circle One)

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 248+19 SB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
0+04						O.J., W.J							
1+10						O.J., W.J.							
1+22						D.P.							
1+36						D.P.							
1+51						B.							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: P. SPALDING

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 8-31-94 Reference No.: 0001
Client: M-DOT
Job. No.: 522- Area:
Job Location: Ramp G.

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 15" Pipe Condition: G	Counter Location: 000 — 0262
Type of Pipe: Conc.	Client Requests Copy: ☐ Yes ☐ No
Type of Joint: O-Ring	Remarks: Storm Line
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0473 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
473						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: _____

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 8-31-94 Reference No.: 0003
Client: M-Dot
Job. No.: 522- Area:
Job Location: Ramp D.

LINE VIDEO INSPECTION REPORT

Inspector:	Job Foreman: Jim W.
Manhole Condition: "A"-	"B"- V.H.S. Tape No.: 1
Pipe Size: 18" Pipe Condition:	Counter Location: 0446 – 0797
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0476 (Circle One)

DIRECTION OF FLOW

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0055						A							
0103						CPL							
0112		b				CPL							
0331						CPR							
0440						CPR							
0443	b		b		46	CPL							
0500			b			CPL							
0564	b		b			CPL							
0570						WJ							
0476						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY:

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 8-31-94 Reference No.: 0002
Client: M-Dot
Job. No.: 522- Area:
Job Location: Cross Over Ramp

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 1
Pipe Size: 15" Pipe Condition: F	Counter Location: 0262 – 0446
Type of Pipe: ~~Clay~~ Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks: Storm Line
Remarks:	

"A" MANHOLE NO. A

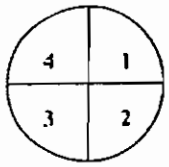
DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0450 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT



DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0000						A							
0424 – 0435						CPL							
0450						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: _____

NTH Consultants, Ltd.

Report on

Closed Circuit Television Survey of Selected Sewers and Culverts Southwestern, Michigan MDOT Project No. ND94-1762

Prepared for:
Michigan Department of Transportation
Lansing, Michigan

Project No 34-4423-00
December 21, 1994

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Data Summary - Plate 0-1	Appendix A
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Closed Circuit Television Inspection Reports 2-1 through 11-3	Appendix B

Videotapes 3, 4 and 5 Bound Separately

NTH Consultants, Ltd.
Professional Engineering and
Environmental Services

277 Gratiot
Suite 600
Detroit, MI 48226
(313) 965-0036
(313) 965-0683 Fax

Mr. Mark A. Van Port Fleet, P.E.
Michigan Department of Transportation
Materials and Technology Division
8885 Ricks Road
P.O. Box 30049
Lansing, Michigan 48909

December 21, 1994
Proj. No. 34-4423-00

RE: Pipe Inspection Contract No. 2
MDOT Contract No. ND94-1762

Dear Mr. Van Port Fleet:

NTH is pleased to submit the results of our Closed Circuit Television Survey of Selected Sewers and Culverts in Southwestern, Michigan. We have revised this report in accordance with your request. Our study was performed in accordance with the Michigan Department of Transportation's special provision for cleaning and videotaping sewers and culverts.

We appreciate this opportunity to have been of service to you. Should you have any questions, please call us at 313-965-0036.

Sincerely,

NTH Consultants, Ltd.

Harry R. Price, P.E.
Senior Project Engineer

Frederick R. Janeczko, P.E.
Project Manager

HRP/FRJ/jw

Attachments

c:\wp51\reports.94\4423.rev\lmq\jw

From the ground up
1968 - 1993

25th

EXECUTIVE SUMMARY

NTH Consultants, Ltd. under contract with Michigan Department of Transportation performed a Closed Circuit Television (CCTV) Survey of 32 test sections of culvert and storm sewer in Southwestern Michigan. The storm sewers and culverts ranged in size from 12 inches to 24 inches in diameter and in length from 26 feet to 282 feet. The test sections surveyed had a total combined length of 3,769 lineal feet, located in ten general sites. The 3,769 lineal feet of pipe consisted of 1,730 lineal feet of concrete pipe, 1008 lineal feet of corrugated metal pipe (CMP) and 1,031 lineal feet of polyethylene pipe. These pipe sections were cleaned of mud and debris prior to the CCTV survey. There was no material transported off of any of the sites. In addition, no hazardous material was encountered. The pipe data is summarized on Plate No. 0-1 in Appendix A.

The 1,730 lineal feet of concrete pipe surveyed was distributed over ten test sections, seven of which contained cracked pipe. The most severely cracked pipes were located in test sections 3-1 and 3-2 (M-44 Four Mile Road to north of Grand River). In addition, half of the concrete test sections contained one or more dips.

Within the polyethylene pipe surveyed, there were 23 dips in the pipe invert. Mandrel testing was performed on 817 lineal feet of the 1,031 lineal feet of polyethylene pipe surveyed. The untested section (Test Section 5-1) was not tested because the angled concrete end sections precluded access for the mandrel. Of the 817 lineal feet tested, the Mandrel was not able to pas through 197 lineal feet (24 percent) of pipe. The remaining 620 lineal feet of pipe (76 percent) Mandrelled falls within the allowable specifications of less than five percent deflection. The percent of polyethelene pipe not passing the Mandrel testing is only indicative of the inability of the Mandrel to pass specific locations. It is possible the pipe lengths between the locations where the Mandrel failed are within the allowable specifications of the less than five percent deflection. The mandrel testing was performed in accordance with the MDOT Standard which is based on a deflection of 5 percent of the nominal pipe diameter,

rather than ASTM. The ASTM method bases their 5 percent deflection on the base inside diameter of the pipe. It is possible for a pipe to fail the MDOT method but pass the ASTM method.

Within the 1,008 lineal feet of CMP surveyed, there were seven dips within the invert of the pipe and five joints which were somewhat open. Several of the pipes had minor dents. The most severe dent was in Section 7-2.

In general, the survey did not encounter any areas which appeared to require prompt corrective measures. The defects revealed by the survey may be monitored or repaired as noted on the individual evaluation sheets. The attached report summarizes our evaluations, presents our evaluation of the individual test location and presents our recommendations relative to remedial measures.

The field reports prepared by Inland Waters Pollution Control, Inc. refer to PVC glued joint pipes being inspected as part of this study. These locations are actually smooth wall polyethylene pipe with O-ring joints. It was determined not to alter the field notes, but to place this corrective statement in the summary report.

1.0 INTRODUCTION

This report presents the results of a Closed Circuit Television (CCTV) condition survey of a series of storm sewers and concerts in Western and Southwestern Michigan. The specific locations to be tested were selected by the Michigan Department of Transportation's (MDOT) Material and Technology Division. It is our understanding that the individual test locations were randomly selected and represent concrete pipe, corrugated metal pipe and polyethylene pipe locations. The individual test locations are shown on segments of the site. Copies of these plans are appended hereto as Plates 2-1 through 11-3. The first number is the MDOT site number and the second is a test location number assigned by NTH. The site designated as Site No. 1 was deleted from this contract.

Authorization to perform this study was provided by MDOT in the form of an authorization letter dated July 22, 1994.

2.0 SCOPE OF STUDY

The purpose of this study investigation is to document the present condition of the selected storm sewers and culverts, obtain sufficient data to assess the present condition of the selected pipes and to evaluate the probable cause or causes of any observed distress. Specifically, this report presents our observation and evaluations regarding the following items:

- Documentation of the type and distribution of any observed distress.
- An assessment of the overall condition of the individual test sections.
- Documentation and evaluation of the mandrel testing of the segments using polyethylene pipe.
- An evaluation of the probable cause or causes of any distress observed.
- Discuss available remedial measures for the conditions observed.

2.1 SITE NO. 1

The site designated as Site No. 1 was to be located on Chapin Road to the US-31/US-33 interchange. This section of roadway was not constructed and this site was deleted.

2.2 SITE NO. 2

Site No. 2 was located on State Highway M-44 between I-196 and Four Mile Road in Kent County. The MDOT designation for Site No. 2 was 41051-25745 . Two sections of storm sewer were surveyed within this site on September 22, 1994. For identification purposes, the individual sections will be identified as Section Nos. 2-1 and 2-2. The individual section designations will also be utilized on all supporting information.

Section 2-1 is a 258-foot long run of 18 inch diameter concrete storm sewer that runs down the median of M-44 from Station 293+00 to Station 290+25. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the pipe is in good condition, however, fine cracks were present at three locations. The cracks appear to be the result of localized variations in the pipe bedding support.

Section 2-2 is a 119-foot long section of 24 inch diameter concrete storm sewer that runs along the median of M-44 from Station 303+50 to Station 302+00. The storm sewer was cleaned of mud and debris with high pressure water jet made during the survey. It appears that the pipe is in good condition.

2.3 SITE NO. 3

Site No. 3 was located on M-44 between Four Mile Road and Grand River in Kent County. The MDOT designation for Site No. 3 was 41051-25746. Two sections of storm sewer were surveyed within this site on September 22, 1994. For identification purposes, the individual sections will be identified as Section Nos. 3-1 and 3-2. The individual section designations will also be utilized on all supporting information.

Section 3-1 is a 235-foot long run of 12-inch diameter concrete storm sewer that runs along the median of M-44 from Station 430+00 to Station 432+40. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the pipe is in fair to poor condition. Fine to medium cracks were observed to be present at numerous locations during the survey. This pattern of cracking suggests that the pipe may have deflected due to overloading or to poor bedding. We recommend that this section of pipe be relined.

Section 3-2 is a 245-foot long section of 18-inch diameter concrete storm sewer that runs along the median of M-44 from Station 494+50 to Station 495+00. The storm sewer was cleaned of

mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the pipe is in fair to poor condition. Both fine and medium cracks were observed at several locations during the survey. The quantity of cracks suggests that there may have been bedding problems or over-compaction of the fill material during construction. We recommend that this section of pipe be relined.

Refer to Figure Nos. 3-1 and 3-2 for detailed accounts of the individual surveys and to Plate Nos. 3-1 and 3-2 for locations of the individual sections.

2.4 SITE NO. 4

Site No. 4 was located on US-131BR between Bessie Street and Lulu Street in Kalamazoo, Michigan. The MDOT designation for Site No. 4 was 39051-31004. Two sections of storm sewer were surveyed within this site on September 21, 1994. For identification purposes, the individual sections will be identified as Section Nos. 4-1 and 4-2. The individual section designations will also be utilized on all supporting information.

Section 4-1 is a 169-foot long section of 12-inch diameter concrete storm sewer that runs beneath northbound US-131BR from Station 88+00 to Station 89+65. The storm sewer was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the pipe is in good condition. No defects were observed during the survey.

Section 4-2 is a 190-foot long section of 15-inch diameter concrete storm sewer that runs beneath northbound US-131BR from Station 91+84 to Station 93+85. The storm sewer was cleaned of mud and debris prior to the CCTV survey. Based on the observations made during the survey, it appears that the pipe is in fair to good condition. Fine cracks were observed at several locations within this section of pipe. The cracks in the pipe are most likely due to localized overstressing or to irregularity in the bedding support.

2.5 SITE NO. 5

Site No. 5 was located on I-94 between Ninth Street and Oakland Drive in Kalamazoo County. The MDOT designation for Site No. 5 was 39024-29669A. One section of storm sewer and four sections of culvert were surveyed within this site on September 20, 1994. For identification purposes, the individual sections will be identified as Section Nos. 5-1 through 5-5. The individual section designations will also be used on all supporting information.

Section 5-1 is a 214-foot long run of 12-inch diameter polyethylene culvert that runs along the median of I-94 at Eighth Street. It should be noted that the culvert was cleaned of mud and debris with high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the culvert is in fair to good condition. Several dips in the pipe were most likely due to variations in grade during the installation. No mandrel testing was performed due to 45 degree bends at the entrance and outlet of the pipe.

Section 5-2 is a 156-foot long section of 12-inch diameter polyethylene culvert that runs down the median of I-94 from Station 343+90 to Station 345+00. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey and mandrel testing indicate that the pipe is in good condition.

Section 5-3 is a 282-foot long section of 12-inch diameter polyethylene culvert that runs down the median of I-94 from Station 351+40 to Station 353+70. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the observations made during the survey, it appears that the pipe is in good condition. However, several variances in grade were observed during the during survey. One joint was also noted to be offset slightly. Some variances in line were also revealed during the mandrel testing when the contractor was only able to advance the mandrel 123 feet from access point "A" Station 351+40 and 157 feet from access point "B" Station 353+70. The majority of variances in line and grade appear to be original installation problems.

Section 5-4 was to be a 300-foot long run of 12-inch diameter polyethylene culvert that was to run down the median of I-94 from Station 385+40 to Station 386+40. Upon arrival to the site, it was discovered that this culvert had not been constructed.

Section 5-5 is a 197-foot long section of 12-inch diameter polyethylene storm sewer that runs along the north side of westbound I-94 from Station 393+00 to Station 391+00. The storm sewer was cleaned of mud and debris prior to the CCTV survey. The observations made during the survey indicate that the pipe is in good to fair condition. Dips in the pipe were observed at three locations. Some deformation of the pipe was noted based on the mandrel testing when the contractor was only able to advance the mandrel 36 feet from access point "A" Station 393+00 and 34 feet from access point "B" Station 391+00. The deformation noted suggest possible settlement while the dips in the pipe appear to be an as-constructed condition.

Refer to Figure Nos. 5-1 through 5-5 for detailed accounts of the individual surveys and to Plate Nos. 5-1 through 5-5 for locations of the individual sections.

2.6 SITE NO. 6

Site No. 6 was located on US-31 at the Lake Chapin Bridge in Berrien County. The MDOT designation for Site No. 6 was 11057-29511A. Five sections of culvert were surveyed within this site on September 19, 1994. For identification purposes, the individual sections will be identified as Section Nos. 6-1 through 6-5. The individual section designations will also be utilized on all supporting information.

Section 6-1 is a 94 foot long section of 15-inch diameter polyethylene culvert that crosses northbound US-31 at Station 748+00. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the pipe is in good to fair condition. However, two dips in the pipe were observed. One of which dipped approximately 5 inches at access point "B" located on the east side of northbound US-31. The dips in the pipe are most likely due to a variation in grade

during construction. The deformation in the crown is most likely the result of overstressing during the backfilling operations.

Section 6-2 is a 115-foot long run of 24-inch diameter concrete culvert that crosses southbound US-31 at Station 753+10. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the culvert is in good condition. Two areas of cracking identified during the field inspection were later determined to be cleaning mark upon review.

Section 6-3 is a 91-foot long section of 24-inch diameter concrete culvert that crosses southbound US-31 at Station 753+10. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the observations made during the survey, the culvert appears to be in good condition. Two areas of cracking originally identified during the survey were upon review identified as cleaning marks and not cracks.

Section 6-4 is a 246-foot long section of 24 inch diameter concrete culvert that crosses US-31 at Station 767+00. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the observations made during the survey, the pipe appears to be in good condition. However, one area of cracking was noted on the crown of the pipe at 197 feet from access point "A" located on the west side of US-31. Two dips were also noted during the survey. The area of cracking appears to be the result of localized stress concentration while the dips appear to be an as-built condition.

Section 6-5 is a 88-foot long run of 15-inch diameter polyethylene culvert that crosses northbound US-31 at Station 772+50. The culvert was cleaned of mud and debris with a high pressure water jet prior to the survey. The observations made during the survey indicate that the culvert is in good condition. However, some deformation was noted based on the mandrel testing. The contractor was only able to advance the mandrel 7 feet from access point "A"

and 19 feet from access point "B". Access points "A" and "B" were located on the east and west sides of northbound US-31, respectively.

2.7 SITE NO. 7

Site No. 7 was located on Old M-21 near Port Sheldon Road in Ottawa County. The MDOT designation for Site No. 7 was 70023-30894A. Two sections of culvert were surveyed within this site on September 22, 1994. For identification purposes, the individual sections will be identified as Section Nos. 7-1 and 7-2. The individual section designations will also be utilized on all supporting information.

Section 7-1 is a 119-foot long section of 18-inch diameter corrugated metal pipe culvert that runs down the median of Old M-21 from Station 531+50 to Station 532+75. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the culvert is in fair condition. There were dips in the pipe were observed during survey which appear to be an as-constructed condition.

Section 7-2 is a 142-foot long section of 18-inch diameter corrugated metal pipe culvert that runs down the median of Old M-21 from Station 544+30 to Station 545+65. The culvert was cleaned of mud and debris prior to the CCTV survey. Based on the observations made during the survey it appears that the culvert is in fair to good condition. However, a 30-inch diameter dent near the crown of the pipe was noted. Two dips in the pipe were also noted. Both the dent and the dips in the pipe appear to be an as-constructed condition. We recommend that the both Section 7-1 and 7-2 be monitored in the future.

Refer to Figure Nos. 7-1 and 7-2 for detailed accounts of the individual surveys and to Plate Nos. 7-1 and 7-2 for detailed locations of the individual sections.

2.8 SITE NO. 8

Site No. 8 was located on eastbound I-96 in Clinton County. The MDOT designation for Site No. 8 was 19022-29655A. One section of culvert was surveyed within this site on September 23, 1994. For identification purposes, the individual section will be identified as Section No. 8-1. The individual section designation will be utilized on all supporting information.

Section 8-1 is a 62-foot long run of 12-inch diameter concrete culvert that crosses the ramp from eastbound I-96 to the rest area at Station 373+00. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the culvert is in good condition other than one area of minor cracking.

2.9 SITE NO. 9

Site No. 9 was located on I-96 at the Black River Bridge in Van Buren County. The MDOT designation for Site No. 9 was 80013-30985. Six sections of downspout at this site were inspected on September 21, 1994. For identification purposes, the individual section will be identified as Section Nos. 9-1 through 9-6. The individual section designations will also be utilized on all supporting information.

Section 9-1 through 9-3 are 54-foot long sections of 12-inch diameter corrugated metal pipe downspouts that run eastward from northbound I-96 at Station 1437+60. The downspouts were cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the downspout are in good condition. No defects were noted during these surveys.

Section 9-4 is a 68-foot long section of 12-inch diameter corrugated metal pipe downspout that runs westward from southbound I-96 at Station 1437+10. The downspout was cleaned mud and debris prior to the CCTV survey. Based on observations made during the survey, the downspout appears to be in good condition.

Section 9-5 is a 69-foot long section 12-inch diameter corrugated metal pipe downspout that runs westward from southbound I-96 at Station 1437+10. The downspout was cleaned of mud and debris prior to the CCTV survey. The observations made during the survey indicate that the downspout is in good condition. However, offset joints were noted at three locations within the downspout. We recommend that the condition of the downspout be monitored and if additional joint offsets develop, the downspout should be relined.

Section 9-6 is a 69-foot long section of 12-inch diameter corrugated metal pipe downspout that runs westward from southbound I-96 at Station 1437+10. Based on the observations made during the survey, the downspout appears to be in good condition other than two joints that were observed to be offset. We recommend that the condition of the downspout be monitored and re-lined if additional distress develops within the downspout.

Refer to Figure Nos. 9-1 through 9-6 for detailed accounts of the individual surveys and Plate Nos. 9-1 through 9-6 for locations of the individual test sections.

2.10 SITE NO. 10

Site No. 10 was located on M-43 in the City of Bangor, Van Buren County. The MDOT designation for Site No. 10 was 80041-31083A. Five sections of culvert were surveyed within this site on September 21, 1994. For identification purposed, the individual sections will be identified as Section Nos 10-1 through 10-5. The individual section designated will also be utilized on all supporting information.

Section 10-1 is a 35-foot long section of 12-inch diameter corrugated metal pipe culvert that crosses a residential driveway on M-43 at Station 91+49. The culvert was cleaned of mud and debris prior to the CCTV survey. This section of pipe appears to be in good condition. The original videotape for this line was inadvertently copied over. The video was electronically recovered and is shown at the end of Tape No. 3.

Section 10-2 is a 35-foot long run of 12-inch diameter corrugated metal pipe culvert that crosses a residential driveway on M-43 at Station 92+43. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on the observations made during the survey the pipe appears to be in generally good condition. However two areas of minor deformation were noted. The minor deformations appear to be the result of large stones coming into contact with the sides of the pipe.

Section 10-3 is a 36-foot long section of 12-inch diameter corrugated metal pipe culvert that crosses a residential driveway on M-43 at Station 93+25. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the culvert is in good condition. However, soil build up suggests that drainage is ponding and that the drainage ditch may require regrading.

Section 10-4 is a 35-foot long section of 12-inch diameter corrugated metal pipe culvert that runs beneath a residential driveway on M-43 at Station 95+20. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the culvert is in generally good condition. However, two areas of localized deformation were noted during the survey. The deformation appears to be the result of localized overstress during backfilling. We recommend that the condition of the culvert be monitored for signs of future corrosion at the two areas of deformation.

Section 10-5 is a 26-foot long section of 12-inch diameter corrugated metal pipe that crosses beneath a residential driveway on M-43 at Station 122+35. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. Based on observations made during the survey, the culvert appears to be in good condition. However, the two areas of localized deformation were noted. The two areas of deformation appear to have been damaged during backfilling.

2.11 SITE NO. 11

Site No. 11 was located at the US-31/Sternberg Road Interchange in the City of Norton Shores, Muskegon County. The MDOT designation for Site No. 11 was 6107A-29443A. Three sections of culvert were surveyed within this site on September 21, 1994. For identification purposes, the individual sections will be identified as Section Nos. 11-1 through 11-3. The individual section designations will also be utilized on all supporting information.

Section 11-1 is a 98-foot long section of 18-inch diameter corrugated metal pipe culvert that crosses beneath Ramp "A" at Station 7+90. The culvert was cleaned of mud and debris with a high pressure water jet prior to the CCTV survey. The observations made during the survey indicate that the culvert is in good condition. No defects were noted other than a slight dip in the pipe. The slight dip in the pipe appears to be an as-constructed condition.

Section 11-2 is a 62-foot long section of 18-inch diameter corrugated metal pipe culvert that runs beneath Ramp D at Station 8+00. The culvert was cleaned of mud and debris with a high pressure water jet. Based on the observations made during the survey, the culvert appears to be in good condition. However, the outlet at access point "B" was partially obstructed. We recommend that the projecting metal at the outlet be cut away.

Section 11-3 is a 52-foot long run of 18-inch diameter corrugated metal pipe culvert that crosses Ramp C at Station 30+25. The culvert was cleaned of mud and debris with a high pressure water jet. The observations made during the survey indicate that the culvert is in good condition. No defects were noted during the survey.

Refer to Figure Nos. 11-1 through 11-3 for detailed accounts of the individual surveys and Plate Nos. 11-1 through 11-3 for locations of the individual sections.

3.0 REMEDIAL MEASURES

In general, there were three basic types of defects noted during the CCTV survey of the selected locations within Contract No. 2. These types are cracking of the reinforced concrete pipe, deflection of the polyethylene and corrugated metal pipes, and offsets between pipe sections. In general, as noted in Section 2 of this report, the lines with defects are functioning substantially as designed.

With respect to the general conditions observed on balance of the project, there are a number of alternatives remedial measures which may be considered relative to the condition observed. These alternative measures are:

- Monitoring
- Relining
- Remove and Replace, including Replace and Abandonment

In the following paragraphs, we will briefly review each of the alternatives.

Monitoring - The present study documents the condition of the various pipes on the date they were surveyed. The study does not, however, provide any information relative to the rate at which the observed defects are developing. In some cases, the observed defects may have occurred during construction and have had little if any change with time. In other cases, the observed defect may be progressing as a creep phenomenon or as a dynamic response to traffic loads. To provide additional information relative to the development of the observed distress in the subject lines, consideration could be given to reexamining the distressed lines at some time in the future. Consideration could also be given to developing an adjustable mandrel for use with the polyethylene pipe locations. Such an adjustable mandrel could be fabricated similar to the Hurco Mandrel utilized by Inland Waters where the size is set by machined end plates. In addition to the 5 percent of nominal diameter utilized in the MDOT

standard, plates could be fabricated for 7 percent, 10 percent, 12 percent and 15 percent of the nominal inside diameter of the pipe. We would recommend a maximum deflection of 15 percent based on a review of the Transport and Road Research Laboratory's Supplemental Report 534 on the Load Carrying Capacity of Cracked Rigid Pipe, a preliminary study, which indicates that above 15 percent the pipe reaches a failure condition.

Relining - The use of a relining strategy provides an opportunity to enhance the strength of an existing sewer line, as well as method for sealing the existing pipe. There are proprietary systems available which may be utilized. One of the oldest systems is the inversion liner system in which a resin soaked liner is expanded into the pipe to be repaired. The resins are then polymerized and cured through the application of heat. The use of a propriety liner system, however, does result in the reduction of the cross sectional area. The available literature suggests that the smoothness of the liner offsets the effect of this reduction in area with a corresponding reduction in the frictional resistance of the liner. In some cases, the literature indicates that the carrying capacity of the pipe with a liner may exceed that of the unrestricted pipe. However when a liner is utilized in a polyethylene pipe, the reduction in frictional resistance may not be as dramatic as that observed when relining a concrete pipe. If a reduction in cross section is not acceptable, it may be necessary to consider the replacement rather than relining. There were two sections of pipe (Section Nos. 3-1 and 3-2) which we would recommend lining.

Removal and Replacement - The removal and replacement of an existing sewer is the last option to be considered. This process requires an excavation either along the existing sewer, removal of the sewer and the installation of a replacement. This method affords the greatest flexibility in construction but requires the replacement of the overlying pavement. Alternatively, the creative use of horizontal boring would allow pipe replacement without interruption to the overlying pavement.

4.0 OBSERVATIONS

Based upon the data developed in this study, we have developed some general observations relative to each of the pipe types surveyed.

4.1 REINFORCED CONCRETE PIPE

In general, the reinforced concrete pipe appeared to be in good condition with only minor cracking observed. The exception to this was Sections 3-1 and 3-2 which both had numerous cracks. While some cracking of concrete pipe may be anticipated, these cracks are normally fine. Studies by the Transportation and Road Research Laboratory indicate that these cracks will undergo autogenous healing and the pipe will develop strengths similar to the uncracked pipe. The cracking observed in Sections 3-1 and 3-2 was more than we would have anticipated. The multiple cracks encountered in the two pipes surveyed suggests that there was a problem in the installation system itself, either in the installation procedure or in the cover over the pipe. We would suggest, based upon the cracking observed, that additional pipe sections installed on this contract be inspected. In addition, we would also suggest that the concrete pipe utilized in this contract be reviewed. The magnitude of the cracking observed suggests that quality control measures alone would not have precluded the cracking.

4.2 CORRUGATED METAL PIPE

The corrugated metal pipe sections explored had a total of seven dips, several of which were up to 5 inches deep. There were also two sections of pipe (Sections 9-5 and 9-6) which had several offset joints. We recommended that these offset joints be monitored for any evidence of developing distress. While these offset joints are not presently impacting the function of these pipe sections, they are not desirable. The presence of an offset joint may lead to localized ground loss above the joints, which may in turn lead to a blocked pipe. We would suggest that the installation of these lines be reviewed to determine if the offset represents an as installed condition or if these pipes were disturbed during final grading after the structure was completed.

With respect to depressed areas on the crown, these are somewhat common in CMP pipe. These localized depressed areas represent a lack of care during backfilling. While CMP is not as flexible as polyethylene pipe it is nonetheless a flexible system and must be treated as such.

4.3 POLYETHYLENE PIPE

The polyethylene pipe sections investigated under this contract performed better on the mandrel test than the sections explored under Contract No. 1 (76 percent passing as opposed to 48 passing in Contract No. 1). There was one pipe section, Section 5-1, which was not mandreled because of 45 degree bends at the end of sections. This section also had several heaves and dips in the grade. In this contract, the mandrel testing suggested that the problems were within the trench sections, rather than adjacent to structures or end sections as was observed in Contract No. 1. All of the polyethylene pipe explored was to be installed in accordance with the MDOT Standard Specifications. The differences observed may represent variations in either quality control or may represent a variation in contractor awareness of the additional care needed with a flexible pipe system. Accordingly, we would suggest that discussing this issue between the representatives of the divisional construction groups. At the present time, the observed deflection does not appear to be causing a problem. However, should the deflection continue to occur, problems could develop. Accordingly we would suggest monitoring as recommended in Section 3.

In general, with respect to the pipe sections which were installed as culverts. A large number of these were partially filled with soil. We would suggest that ditch grades be reviewed and consideration be given to increasing the steepness of the slope. Alternately, the ditches could be lowered.

With respect to the pipe installation procedures for all of the pipe types utilized, we would suggest that these should be reviewed. In addition, we would suggest that the fine points of the installation procedures be reviewed with contractors prior to the start of a project.

APPENDIX A

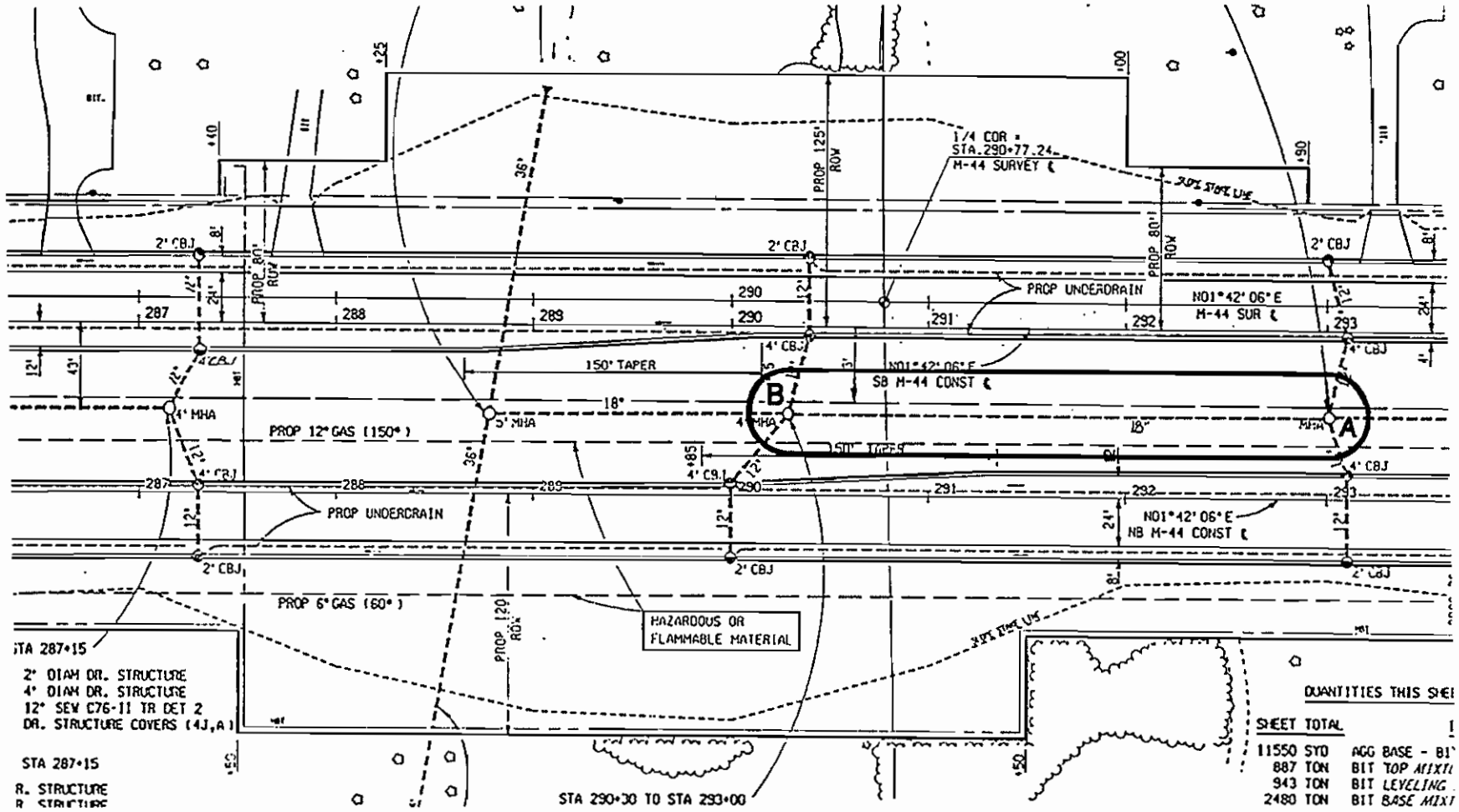
MDOT CONTRACT NO. 2

PLATE 0-1

DATA SUMMARY

SECTION	SIZE DIA. IN.	LENGTH FEET	CONC.	POLY	CMP	MANDREL TEST ON POLY PIPE PASS FT.	TOTAL FT.
2-1	18	258	258				
2-2	24	119	119				
3-1	12	235	235				
3-2	18	245	245				
4-1	12	169	169				
4-2	15	190	190				
5-1	12	214		214	NO ACCESS	FOR MANDREL	
5-2	12	156		156		156	156
5-3	12	282		282		280	282
5-4	SECTION DOES NOT EXIST						
5-5	12	197		197		70	197
6-1	15	94		94		88	94
6-2	24	115	115				
6-3	24	91	91				
6-4	24	246	246				
6-5	15	88		88		26	88
7-1	18	119			119		
7-2	18	142			142		
8-1	12	62	62				
9-1	12	54			54		
9-2	12	54			54		
9-3	12	54			54		
9-4	12	68			68		
9-5	12	69			69		
9-6	12	69			69		
10-1	12	35			35		
10-2	12	35			35		
10-3	12	36			36		
10-4	12	35			35		
10-5	12	26			26		
11-1	18	98			98		
11-2	18	62			62		
11-3	18	52			52		
TOTAL		3769	1730	1031	1008	620	817

PERCENT OF POLYETHYLENE PIPE FAILING MANDREL TEST = 24.11%



PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 2: M-44 I-196 TO 4 MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	2-1
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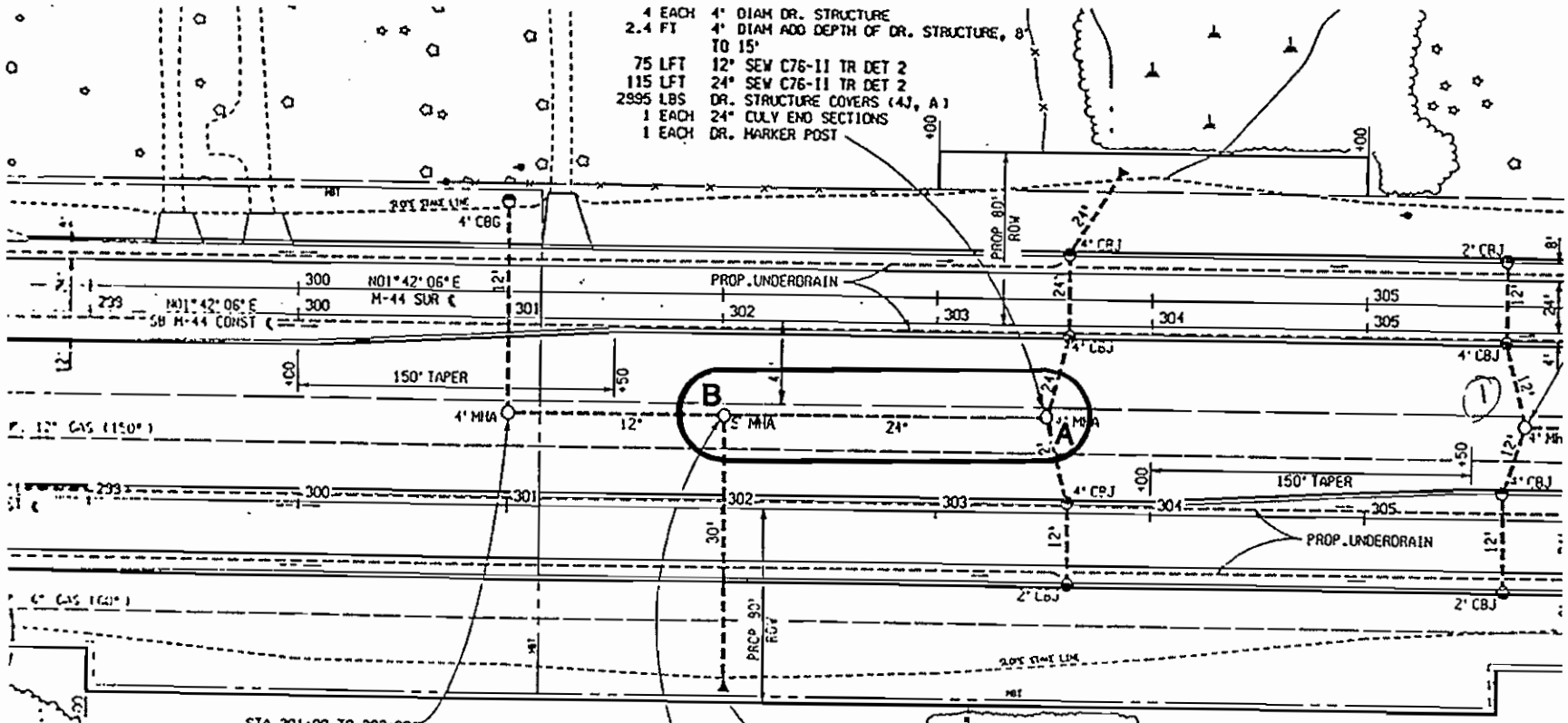
•09-13-94



PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 2: M-44 I-196 TO 4 MILE ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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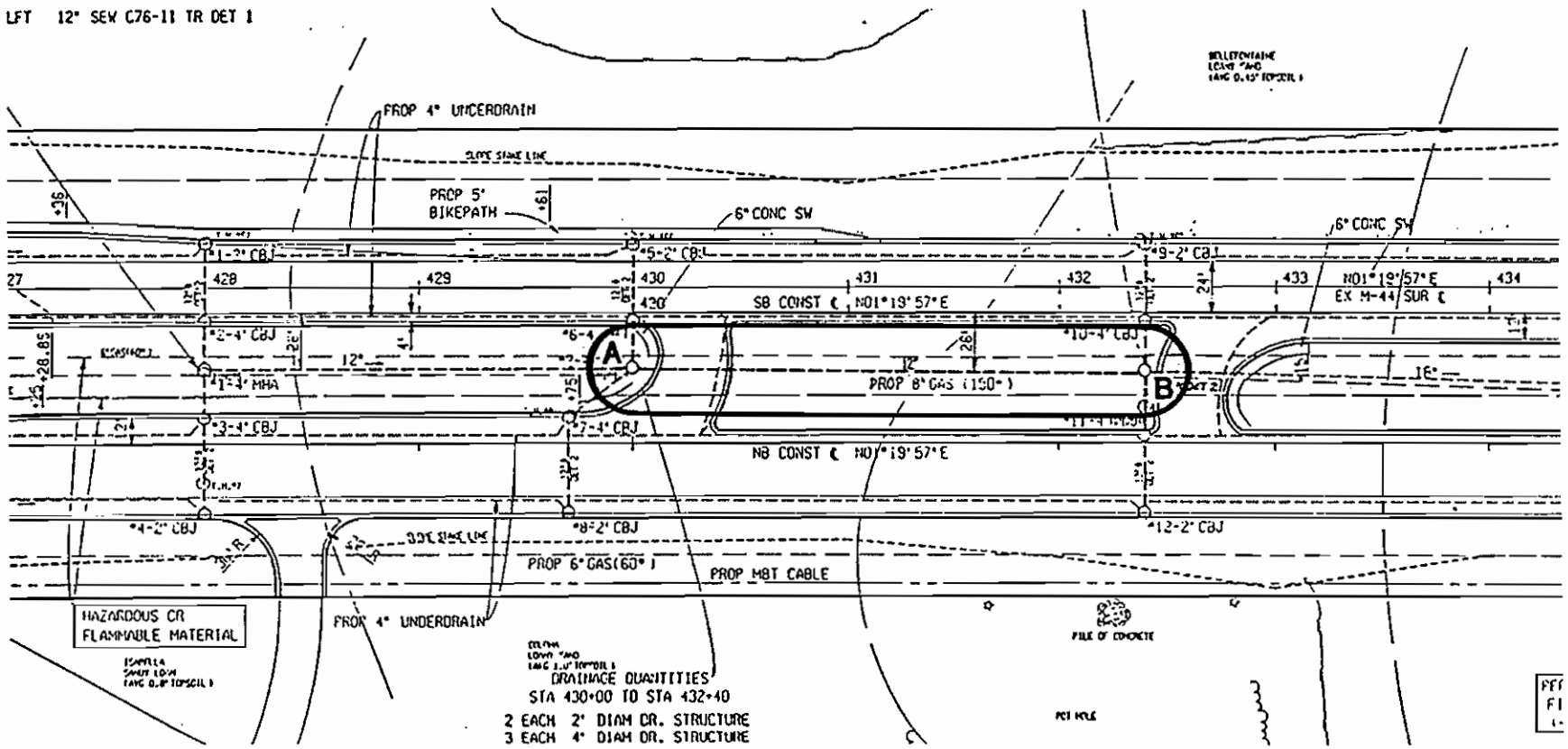

NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 3: M-44 4 MILE ROAD TO NORTH OF GRAND RIVER AVE.

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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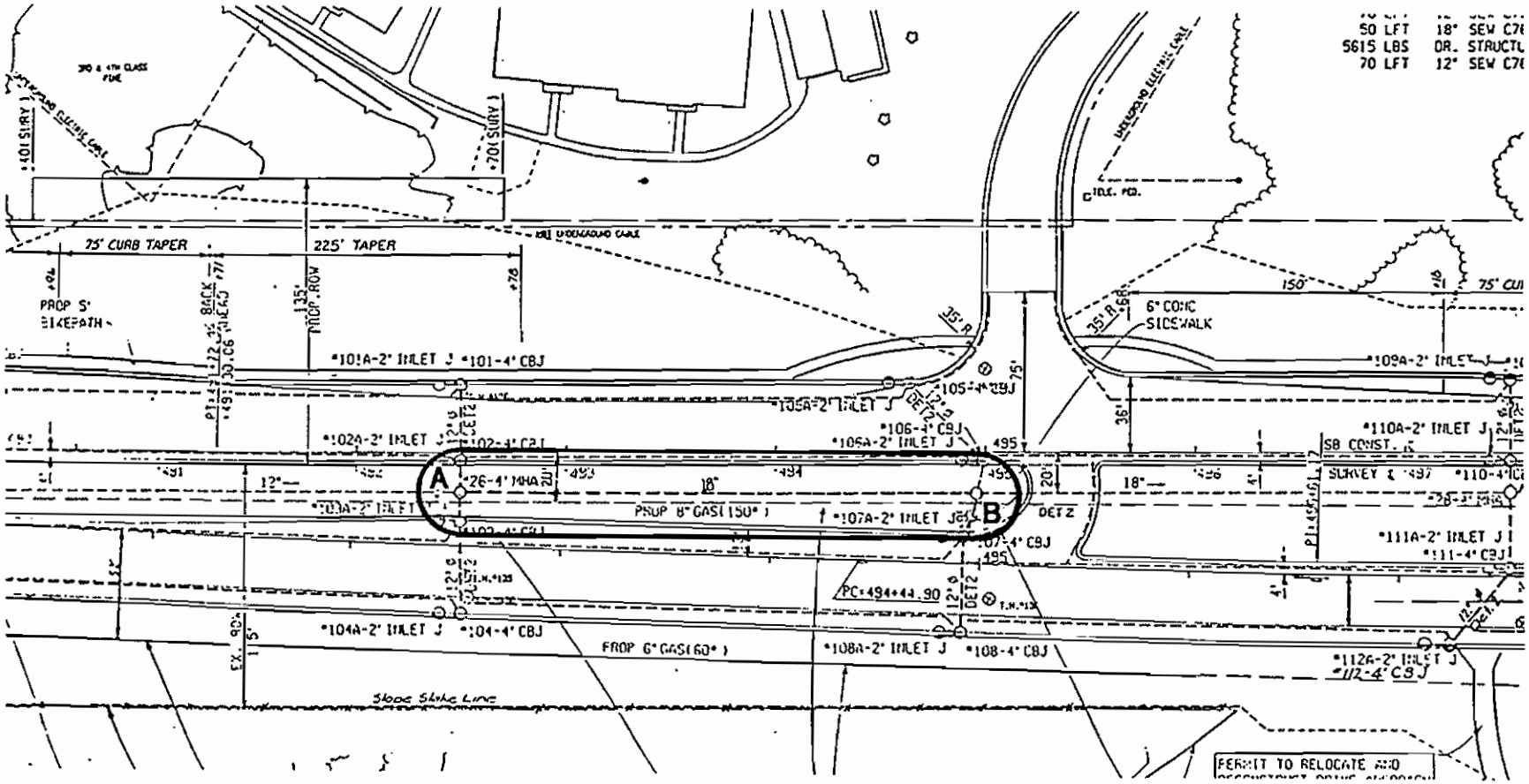
●09-13-94



PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 3: M-44 4 MILE ROAD TO NORTH OF GRAND RIVER AVE.

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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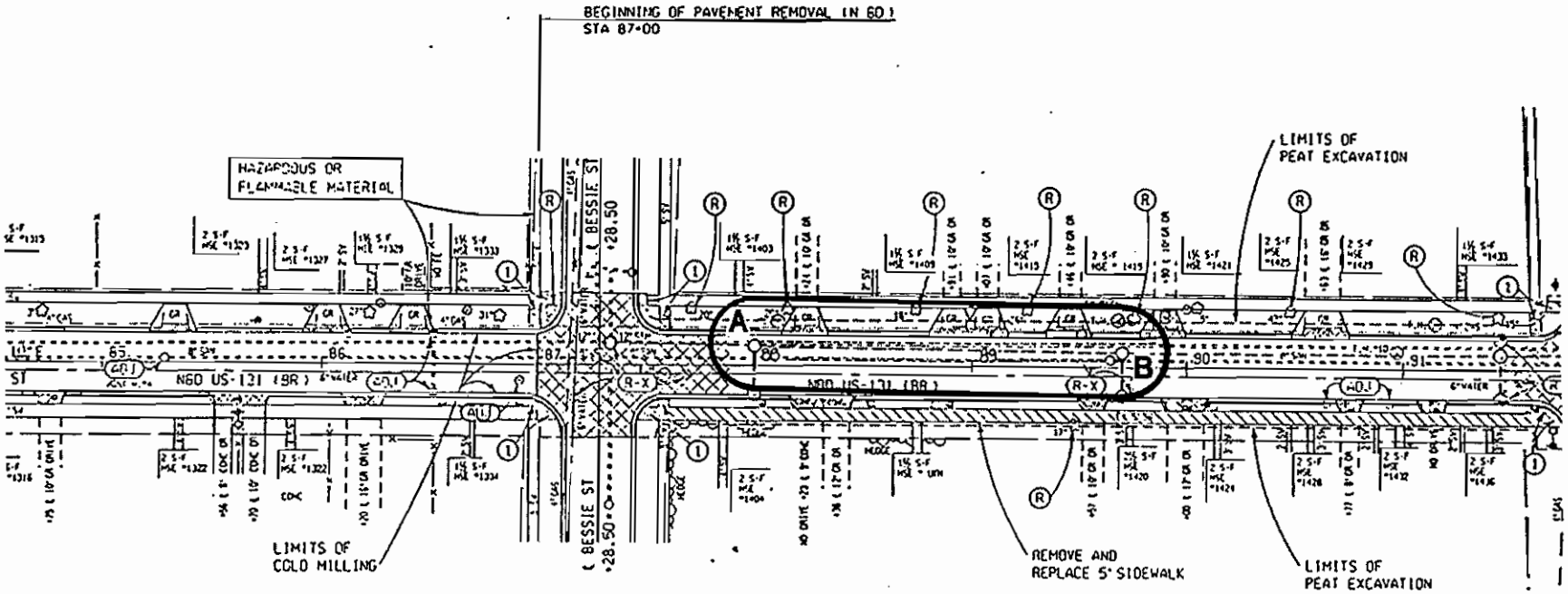

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 4: US–131 BR BESSIE ST. TO NORTH OF LULU ST.

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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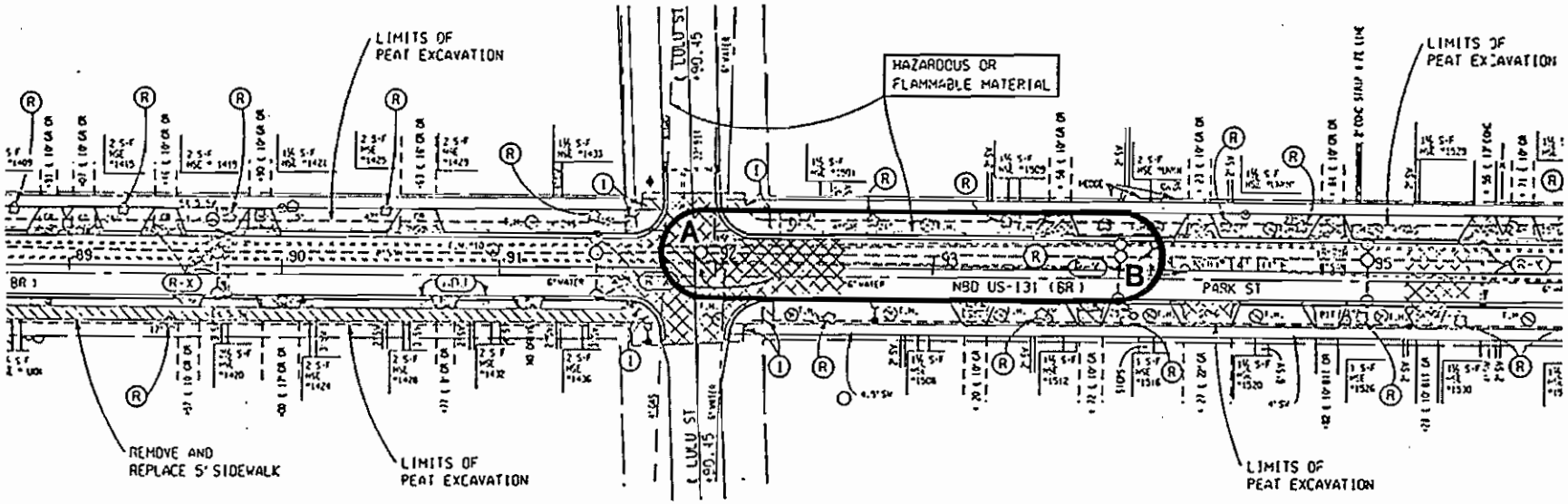
●09–13–94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 4: US-131 BR BESSIE ST. TO NORTH OF LULU ST.

NTH CONSULTANTS, LTD.
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Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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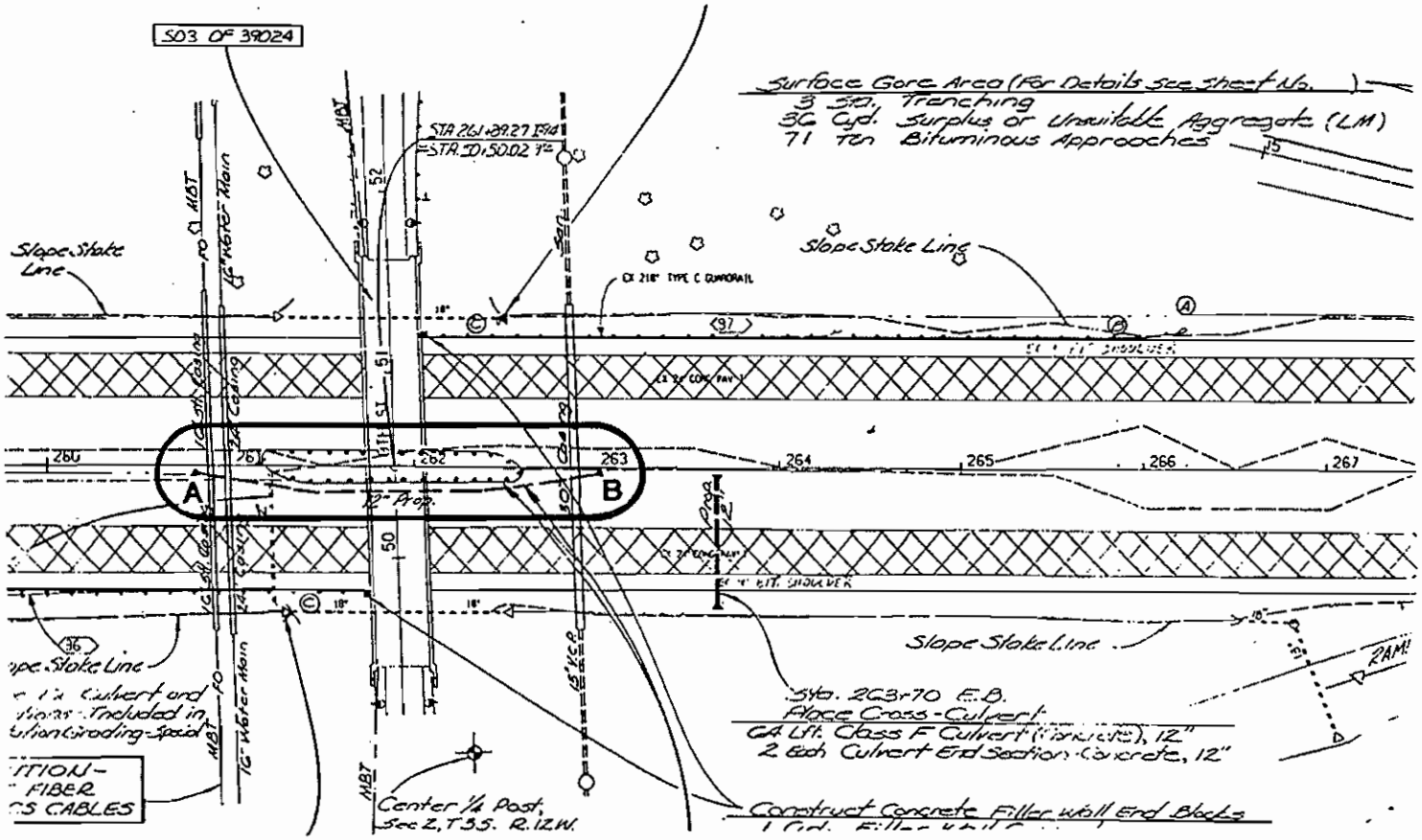

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 5: I-94 EAST OF 9TH ST. TO EAST OF OAKLAND DR.

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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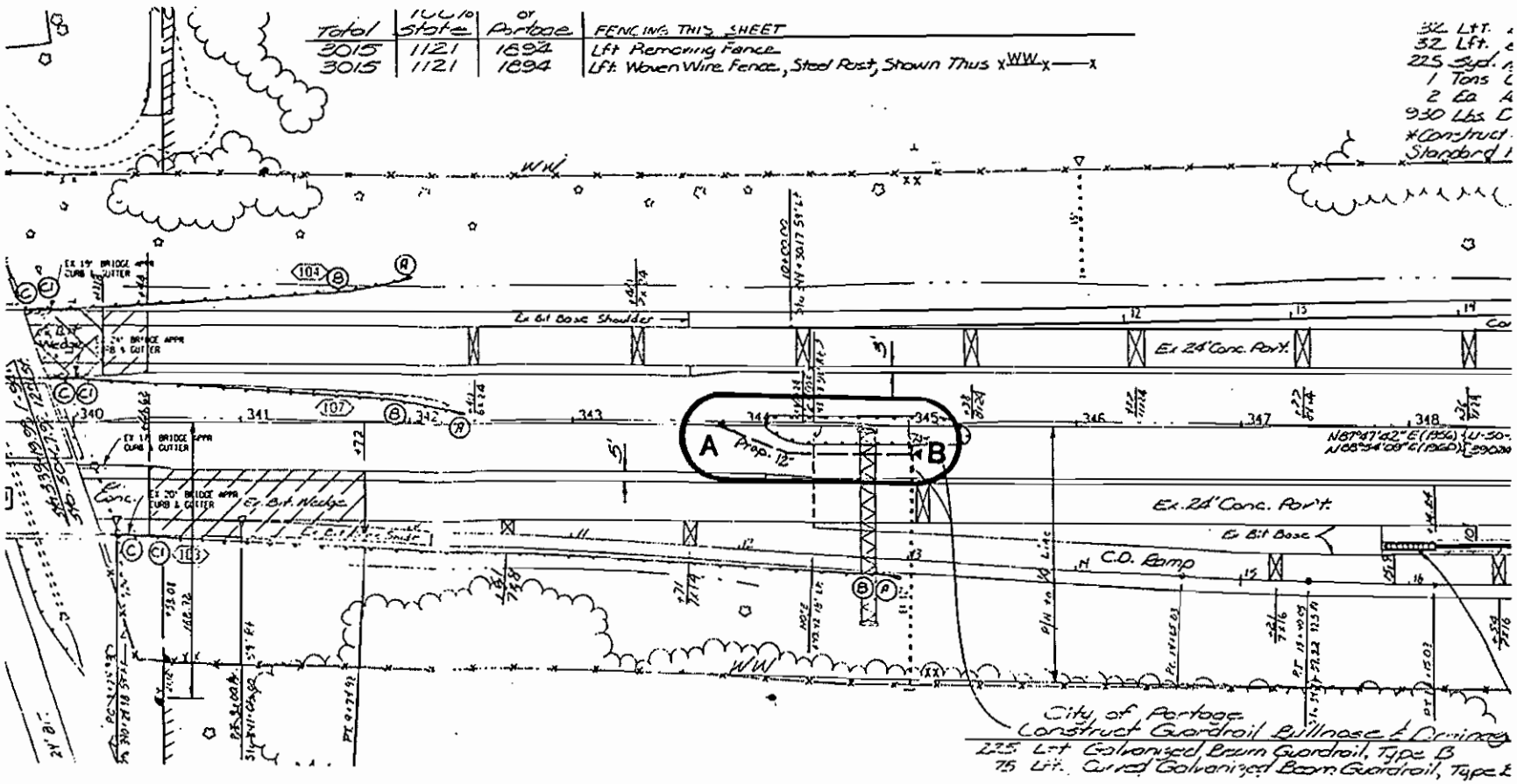

NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 5: I-94 EAST OF 9TH ST. TO EAST OF OAKLAND DR.

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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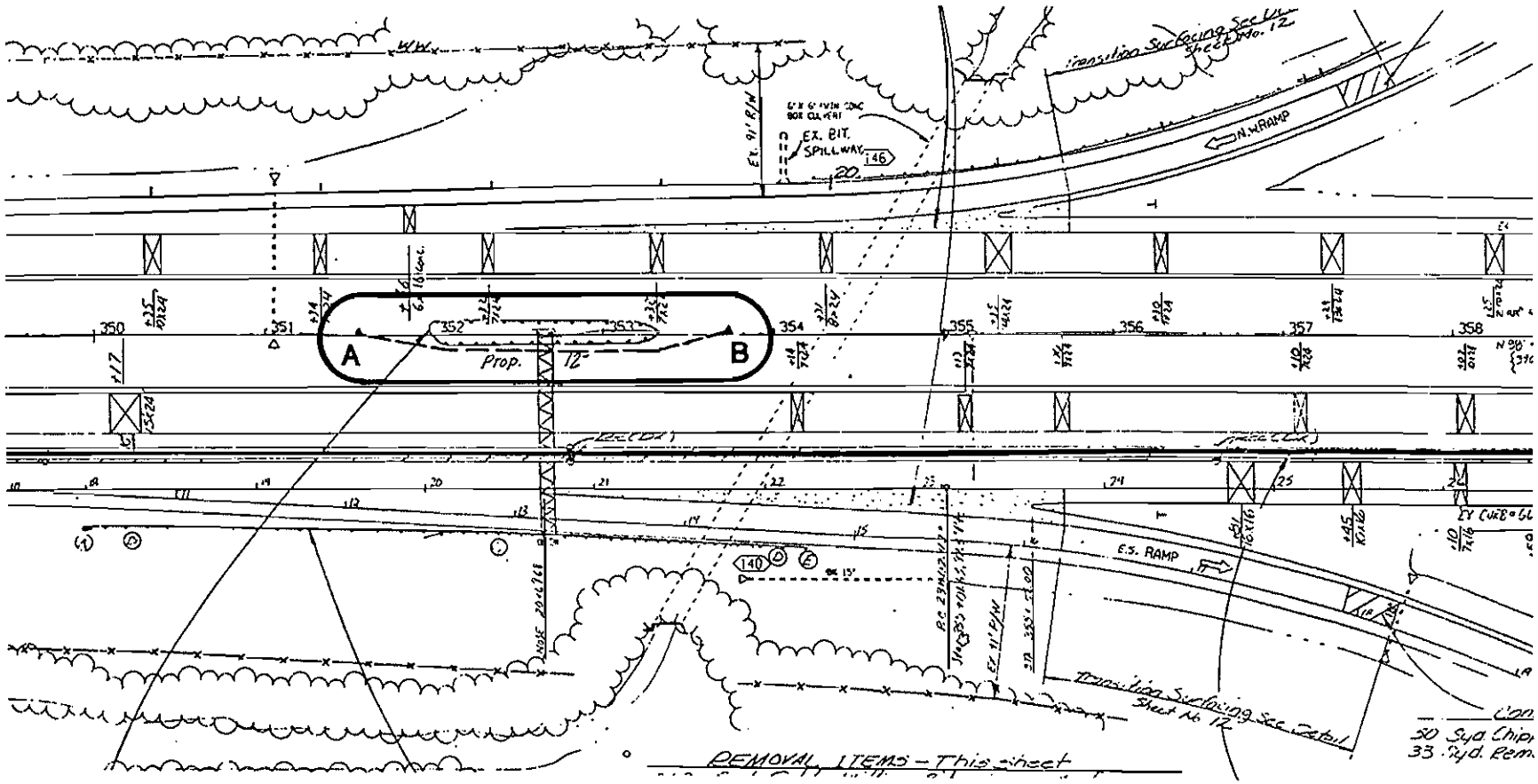

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PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 5: I-94 EAST OF 9TH ST. TO EAST OF OAKLAND DR.

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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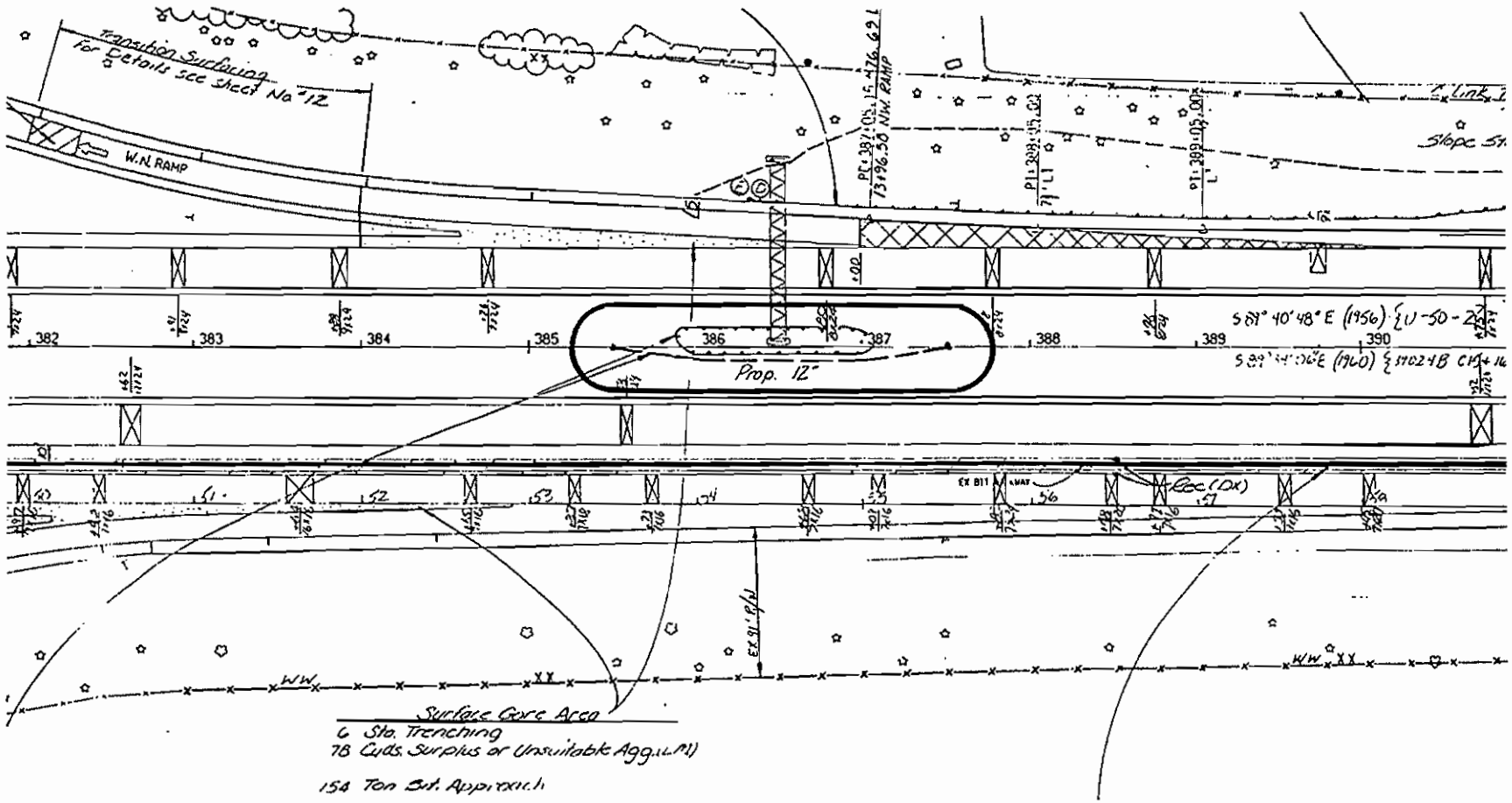

NOT CONSTRUCTED

NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 5: I-94 EAST OF 9TH ST. TO EAST OF OAKLAND DR.

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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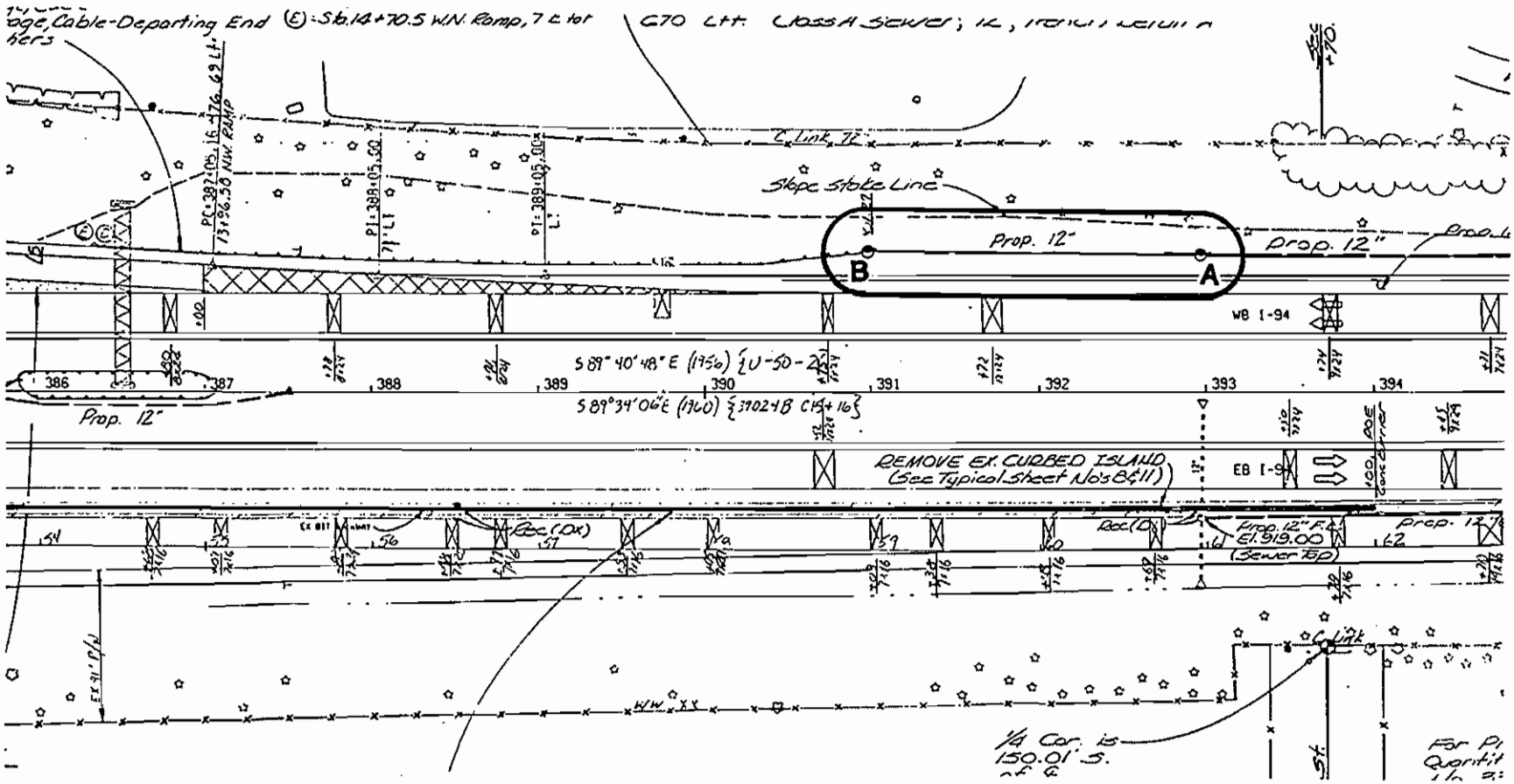

NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 5: I-94 EAST OF 9TH ST. TO EAST OF OAKLAND DR.

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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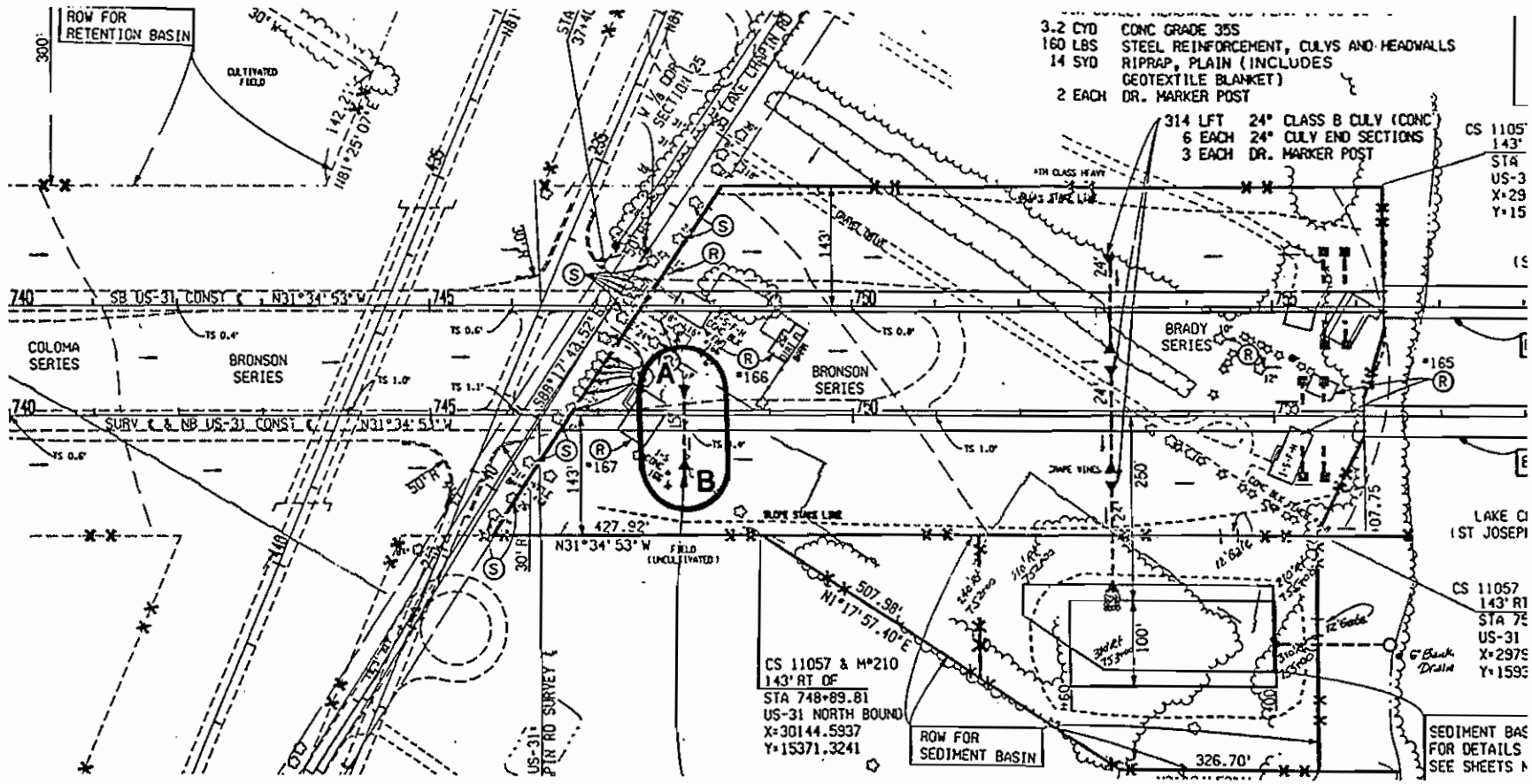

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 6: US-31 APPROACHES TO LAKE CHAPIN STRUCTURE

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	6-1
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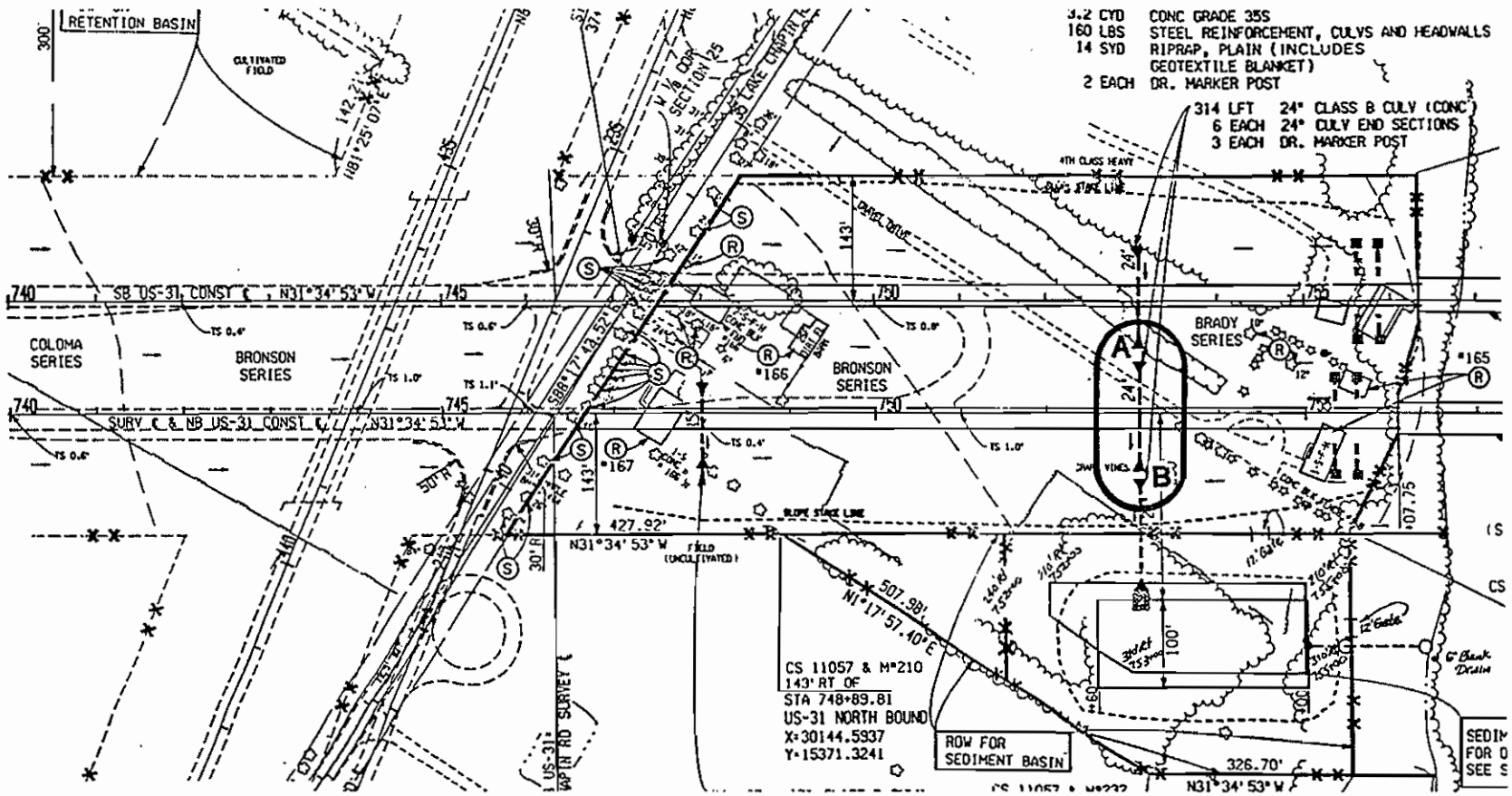
•4423
•09-13-94



PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 6: US-31 APPROACHES TO LAKE CHAPIN STRUCTURE

NTH CONSULTANTS, LTD.
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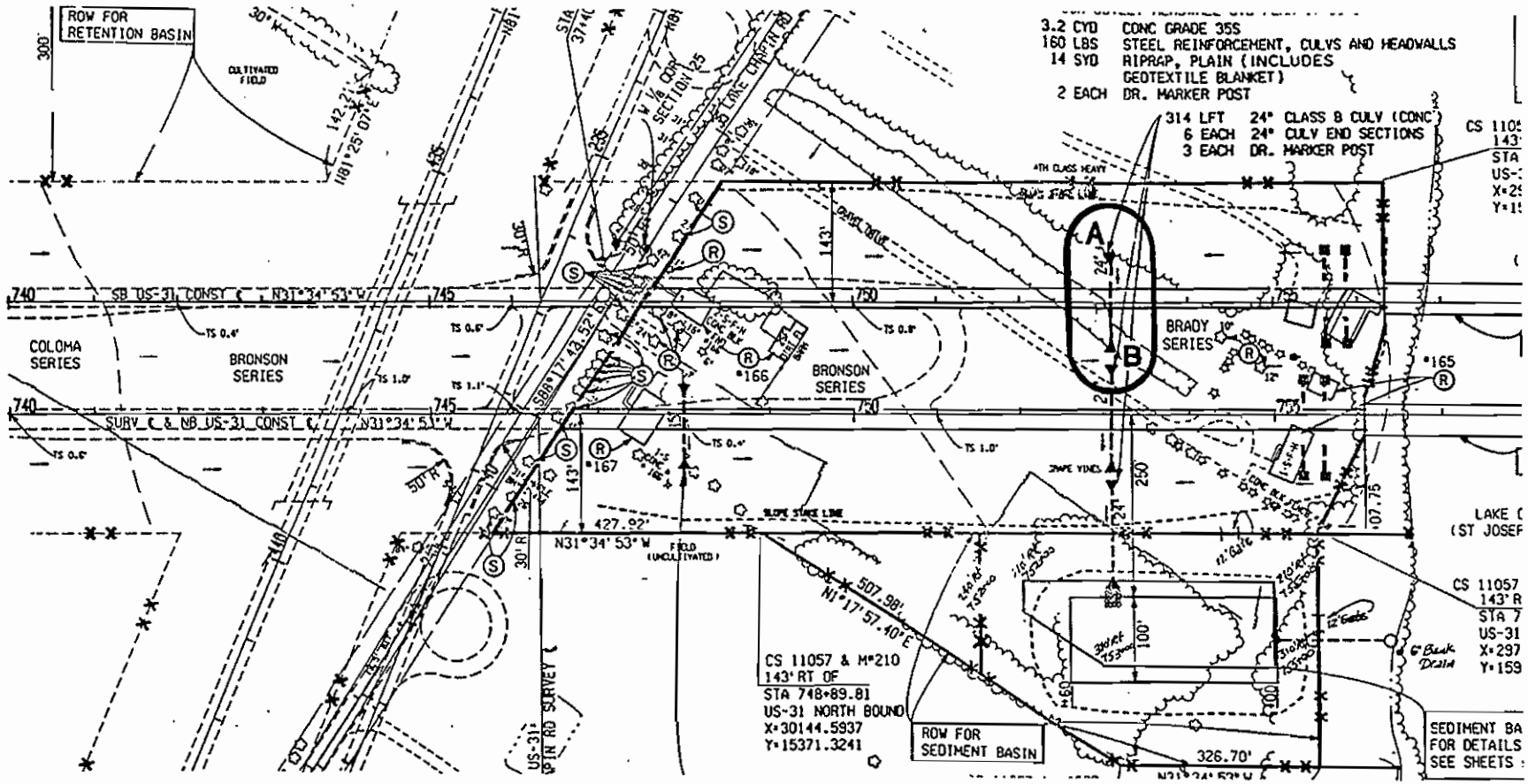
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	6-2
SCALE: NONE	CHECKED BY: HRP	SHEET 2 OF 5	

#4423
#09-13-94



PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 6: US-31 APPROACHES TO LAKE CHAPIN STRUCTURE

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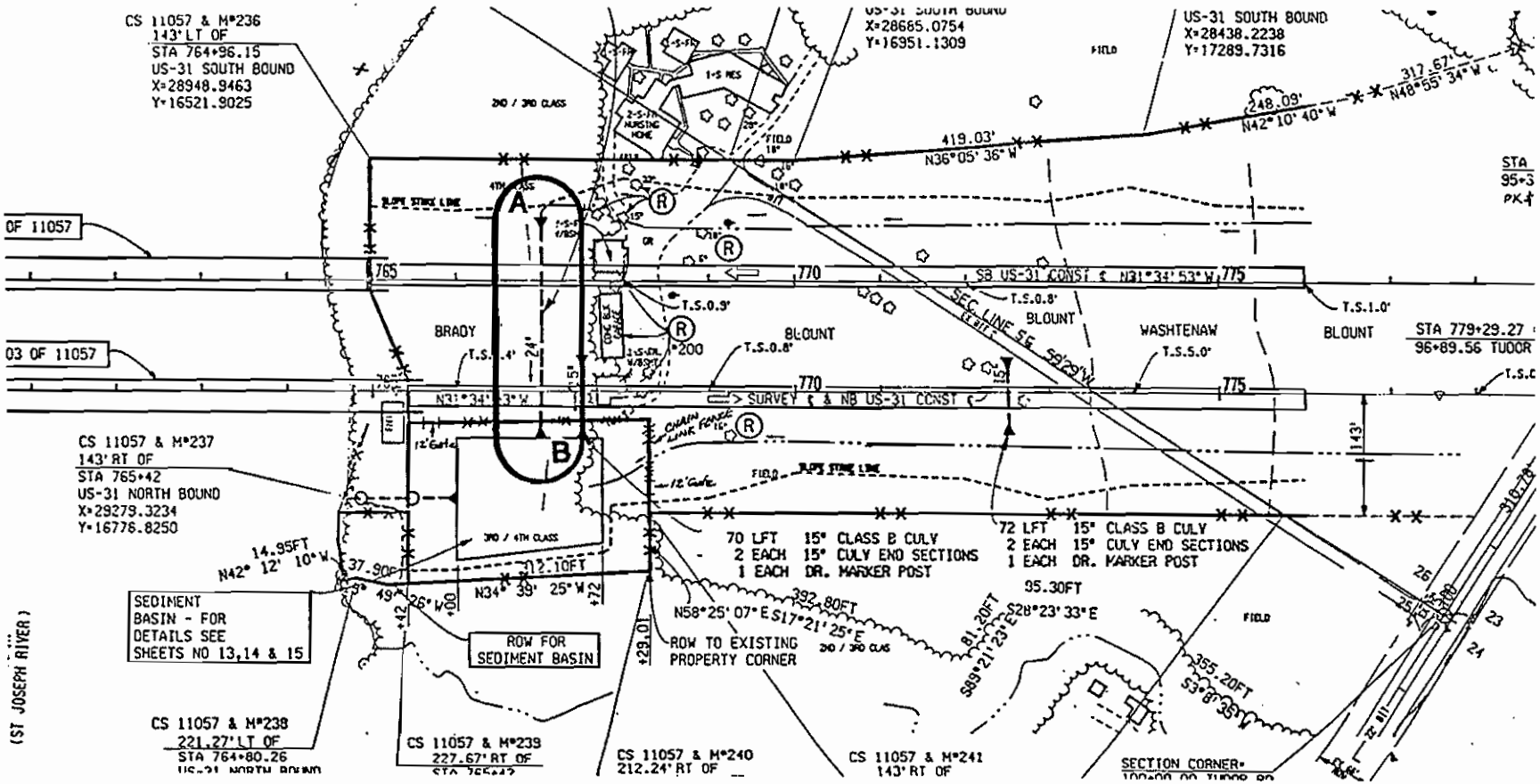
PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	6-3
SCALE: NONE	CHECKED BY: HRP	SHEET 3 OF 5	

•4423
•09-13-94



PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 6: US-31 APPROACHES TO LAKE CHAPIN STRUCTURE

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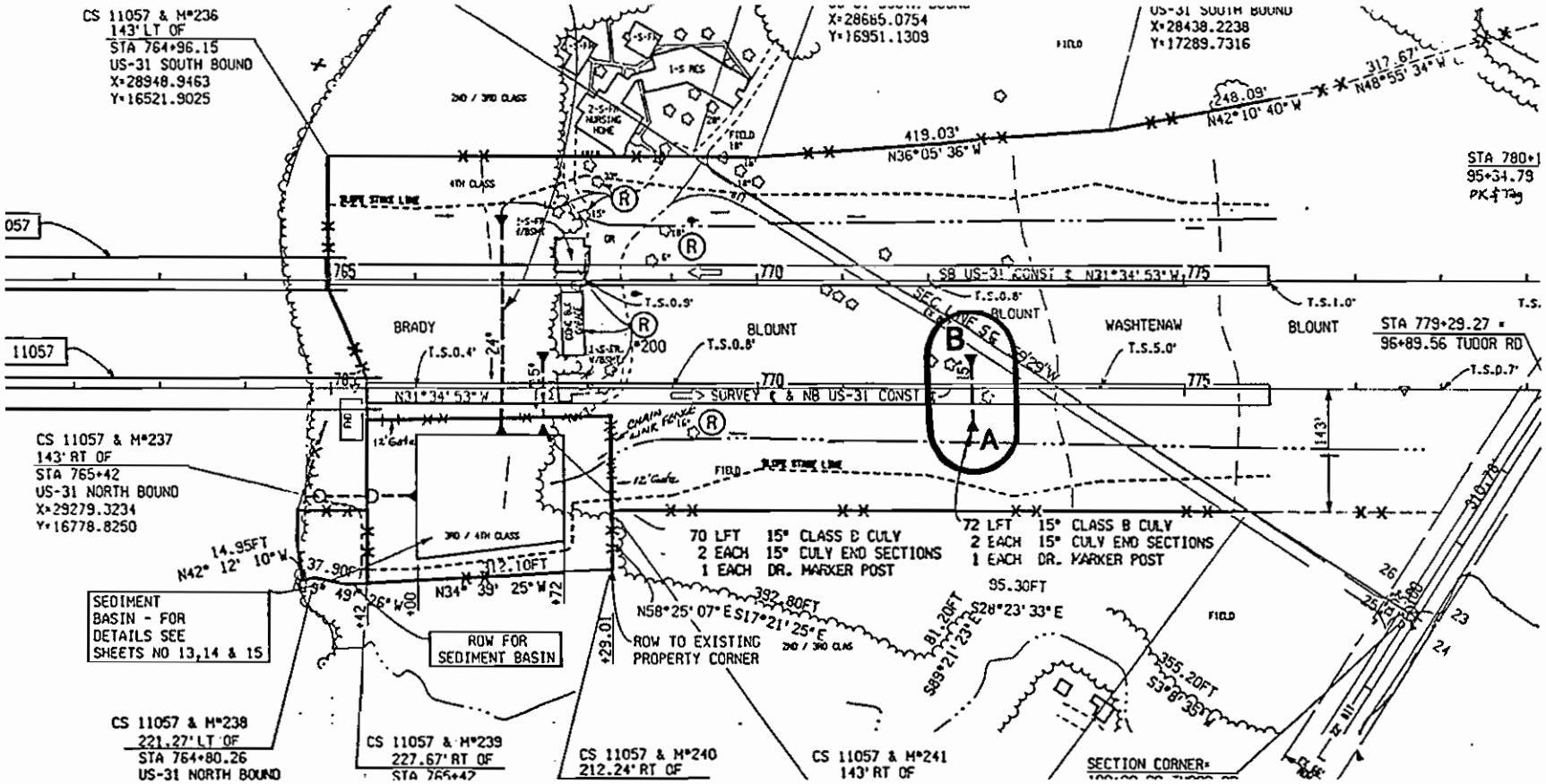
PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	6-4
SCALE: NONE	CHECKED BY: HRP	SHEET 4 OF 5	

#4423
#09-13-94



PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 6: US-31 APPROACHES TO LAKE CHAPIN STRUCTURE

NTH CONSULTANTS, LTD.
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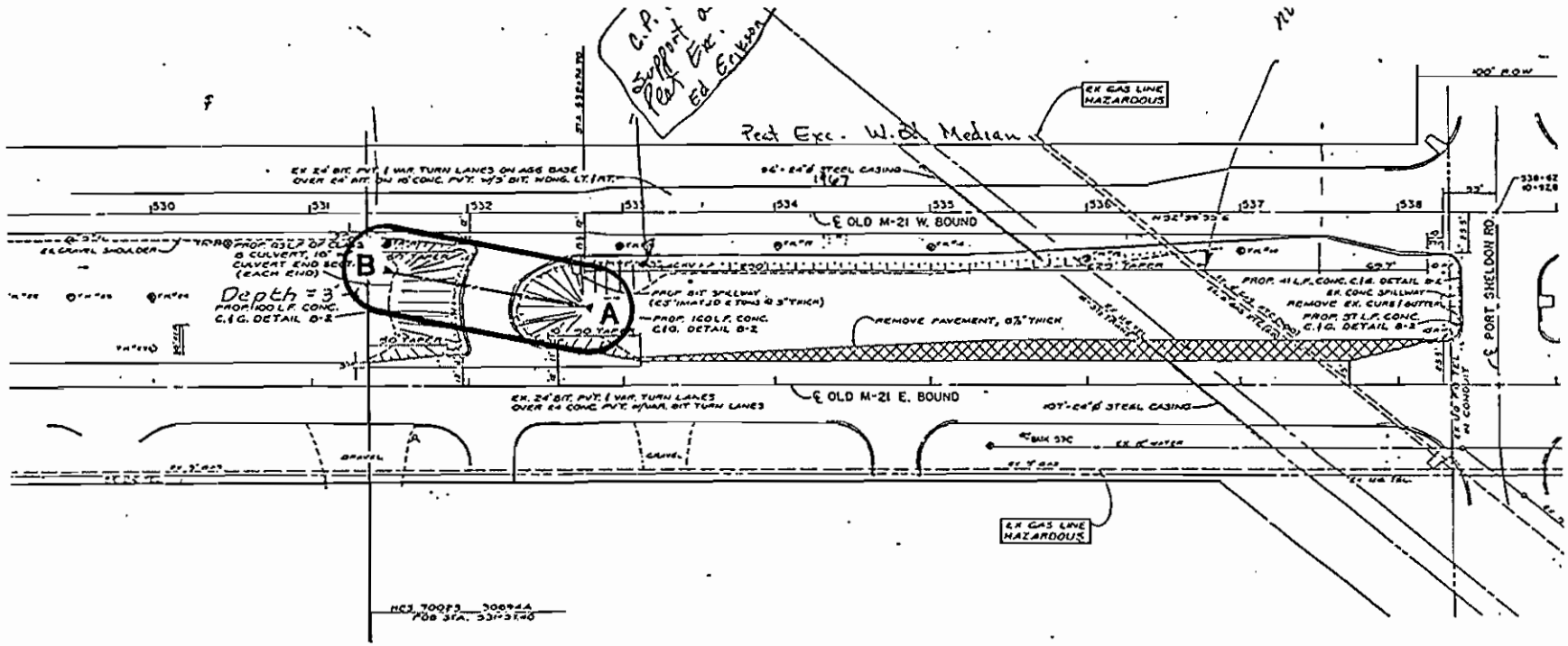
PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	6-5
SCALE: NONE	CHECKED BY: HRP	SHEET 5 OF 5	

•4423
•09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 7: OLD M-21 NEAR PORT SHELDON ROAD

NTH CONSULTANTS, LTD.
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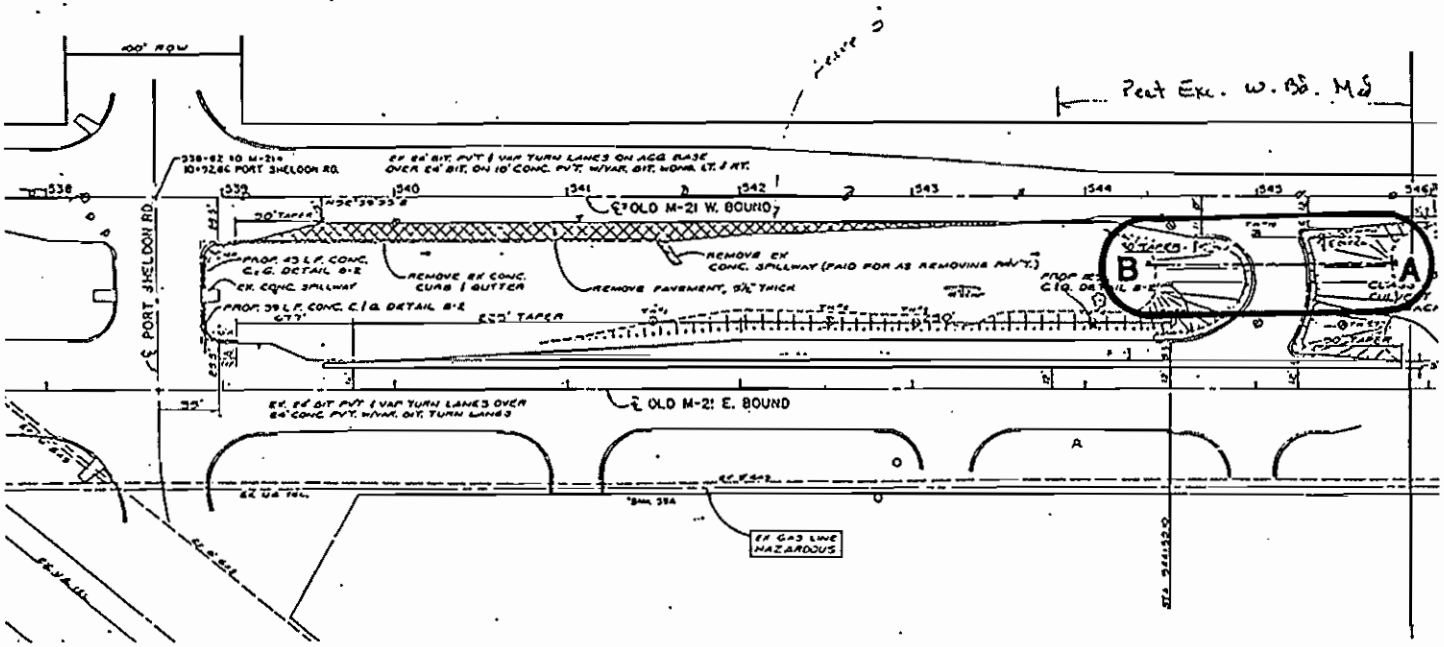
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	7-1
SCALE: NONE	CHECKED BY: HRP	SHEET 1 OF 2	

#4423
09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

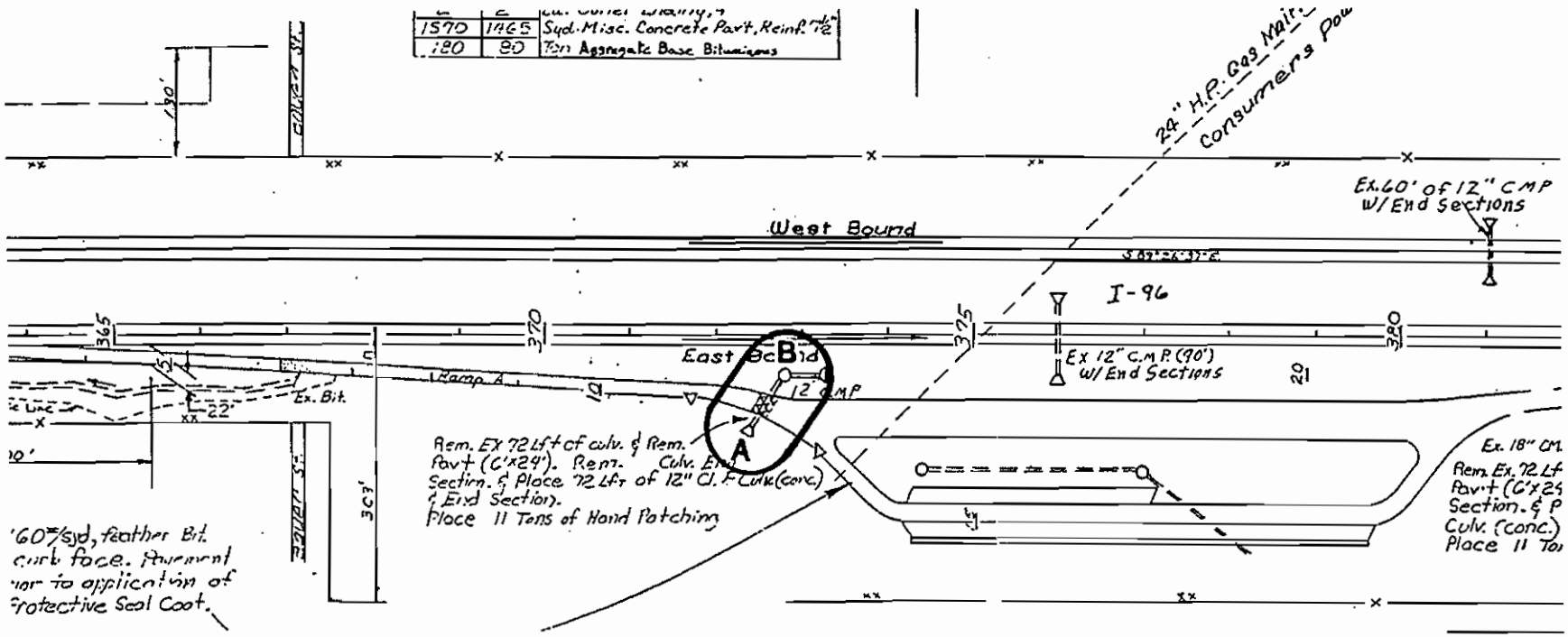
MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 7: OLD M-21 NEAR PORT SHELDON ROAD

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	7-2
SCALE: NONE	CHECKED BY: HRP	SHEET 2 OF 2	

•4423
•09-13-94

1570	1465	Syd. Misc. Concrete Pavt. Reinf. 7½"
180	80	Ton Aggregate Base Bituminous



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 8: I-96

NTH CONSULTANTS, LTD.
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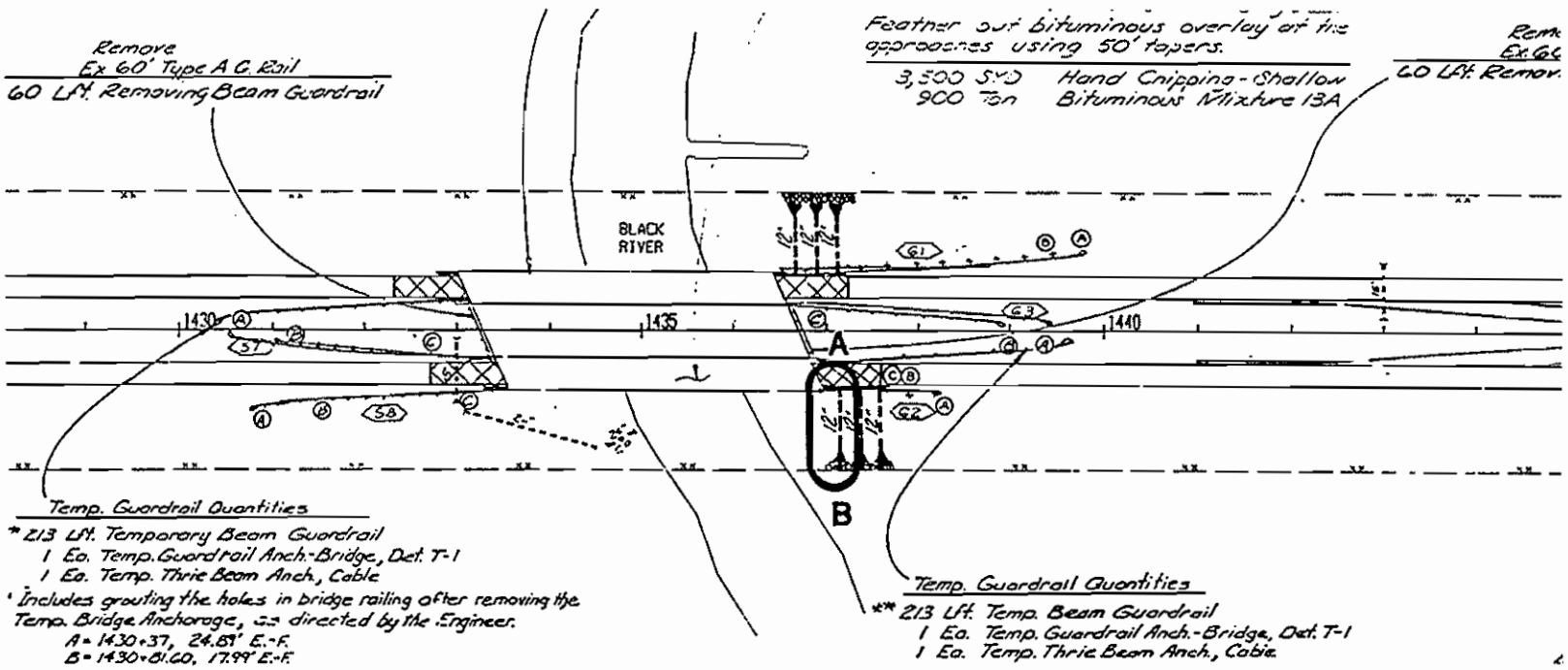
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	8-1
SCALE: NONE	CHECKED BY: HRP	SHEET 1 OF 1	

●4423
●09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 9: I-196 OVER THE BLACK RIVER

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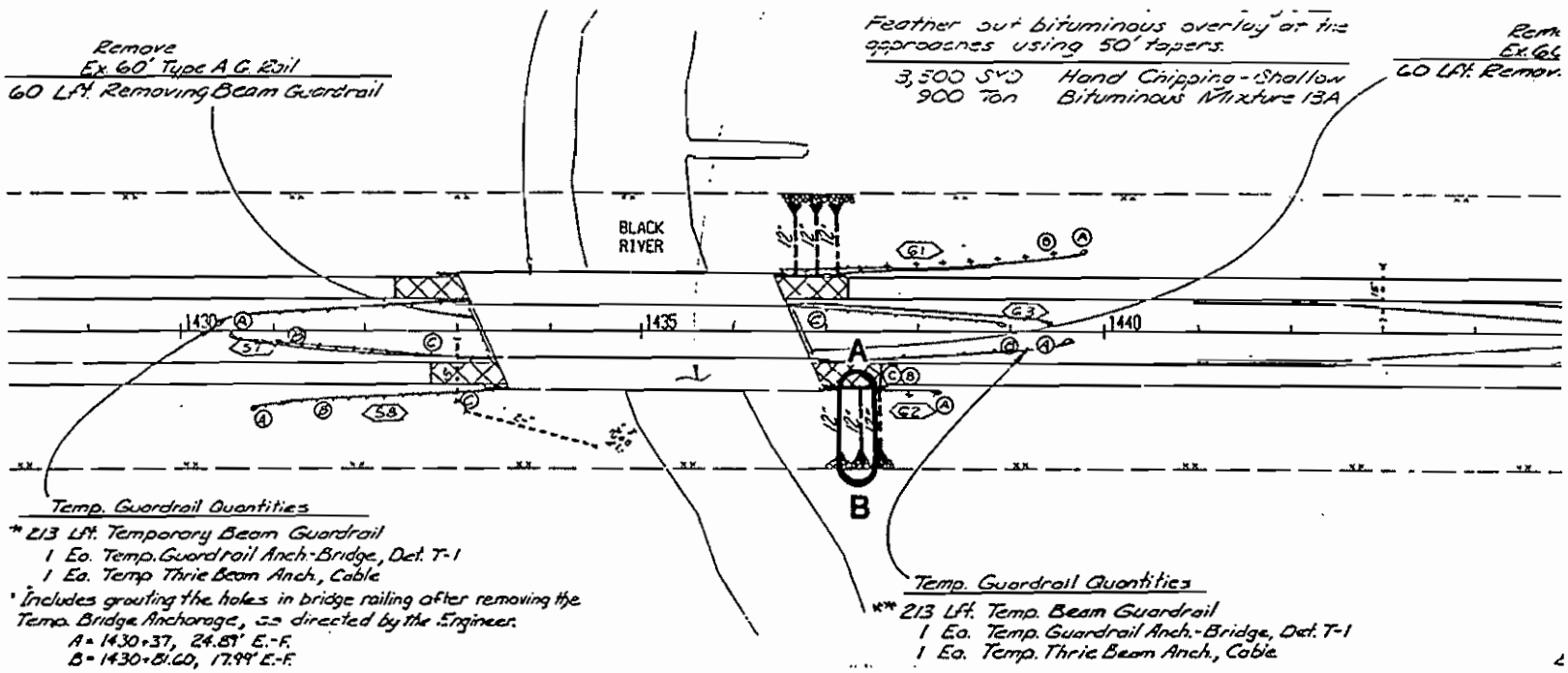
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	9-1
SCALE: NONE	CHECKED BY: HRP	SHEET 1 OF 6	

●4423
●09-13-94



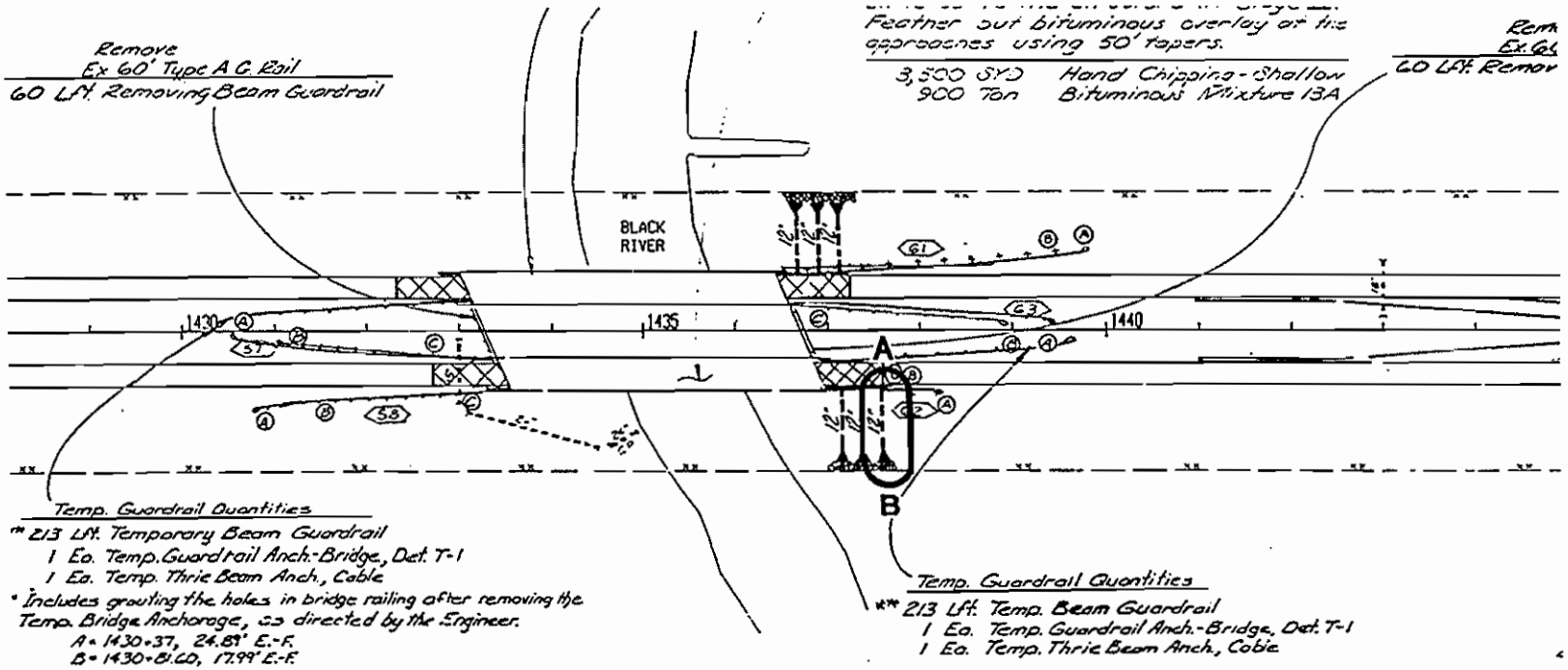
PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 9; I-196 OVER THE BLACK RIVER

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	9-2
SCALE: NONE	CHECKED BY: HRP	SHEET 2 OF 6	

•4423
•09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 9: I-196 OVER THE BLACK RIVER

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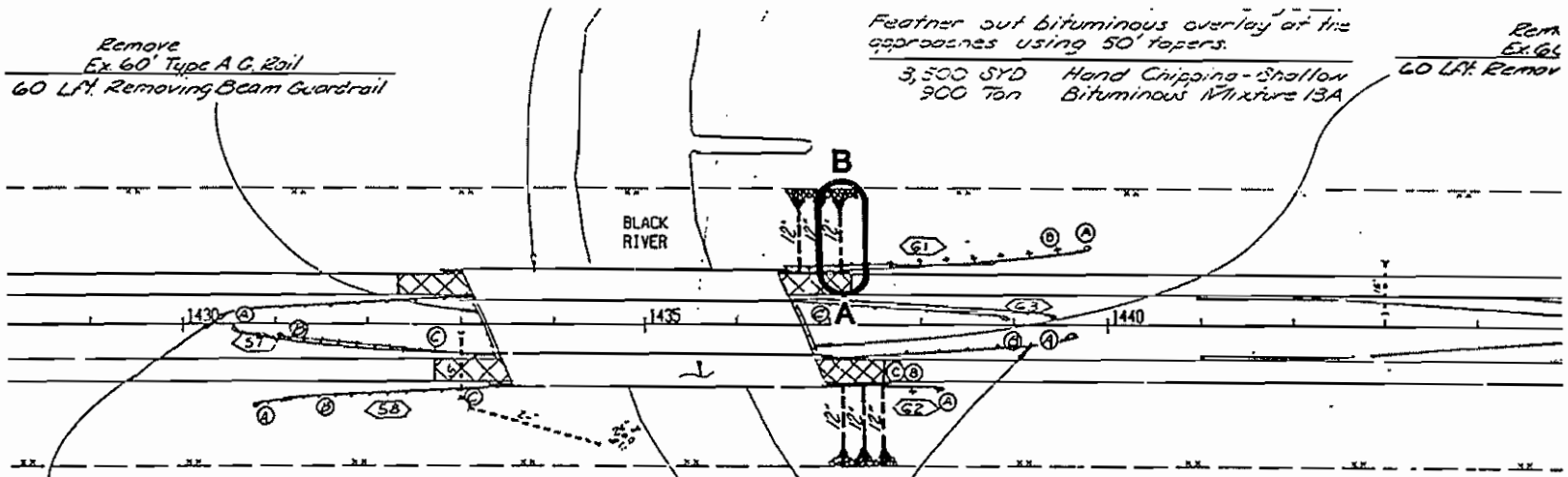
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	9-3
SCALE: NONE	CHECKED BY: HRP	SHEET 3 OF 6	

•4423
•09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 9: I-196 OVER THE BLACK RIVER

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	9-4
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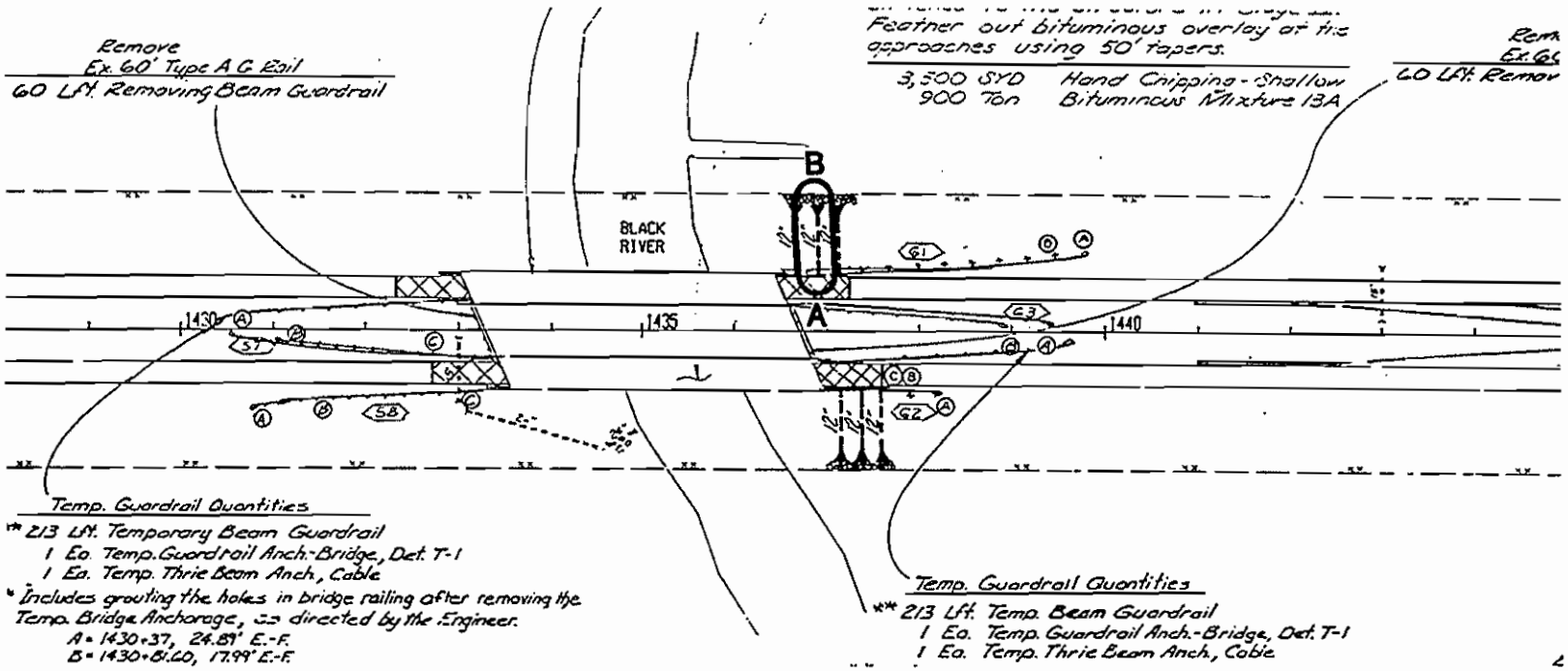
#4423
09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 9: I-196 OVER THE BLACK RIVER

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Professional Engineering & Environmental Services
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PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	9-5
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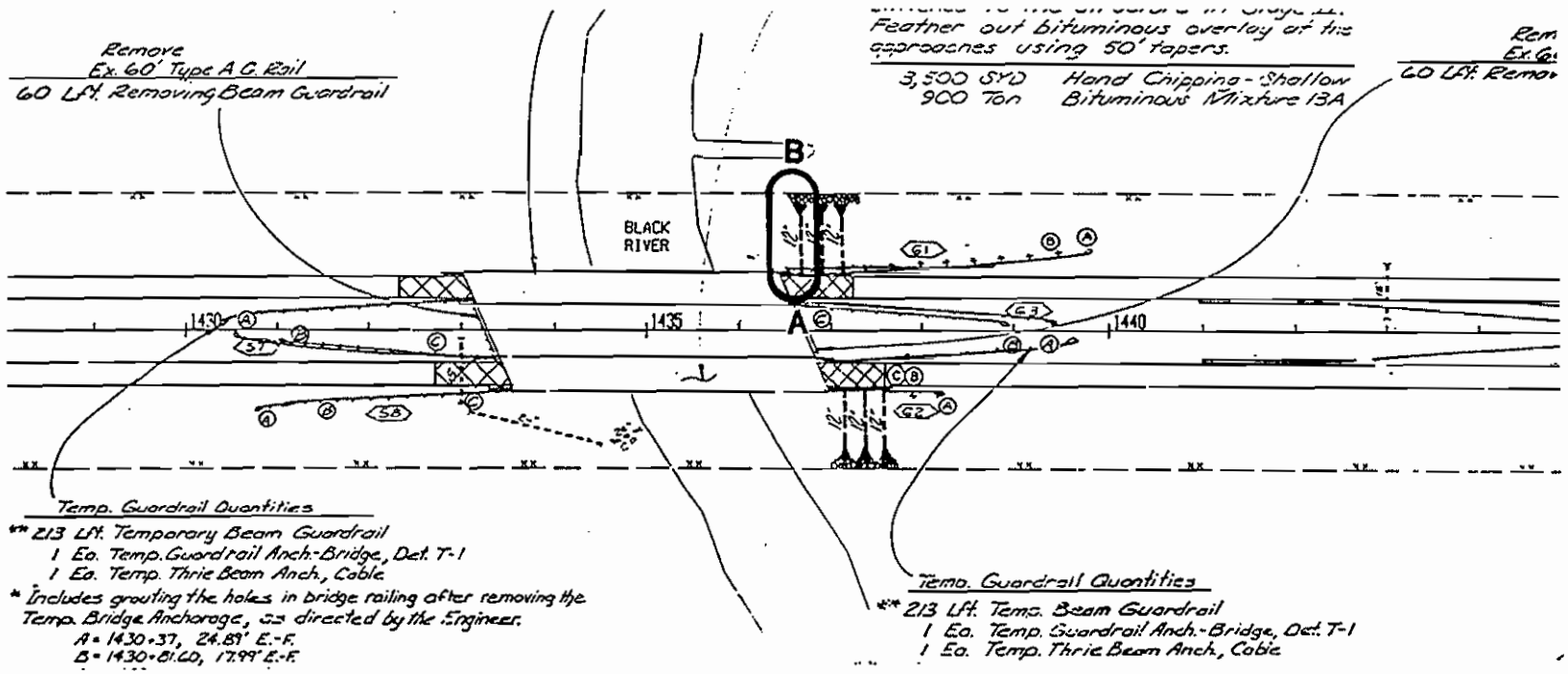
●4423
●09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 9: I-196 OVER THE BLACK RIVER

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PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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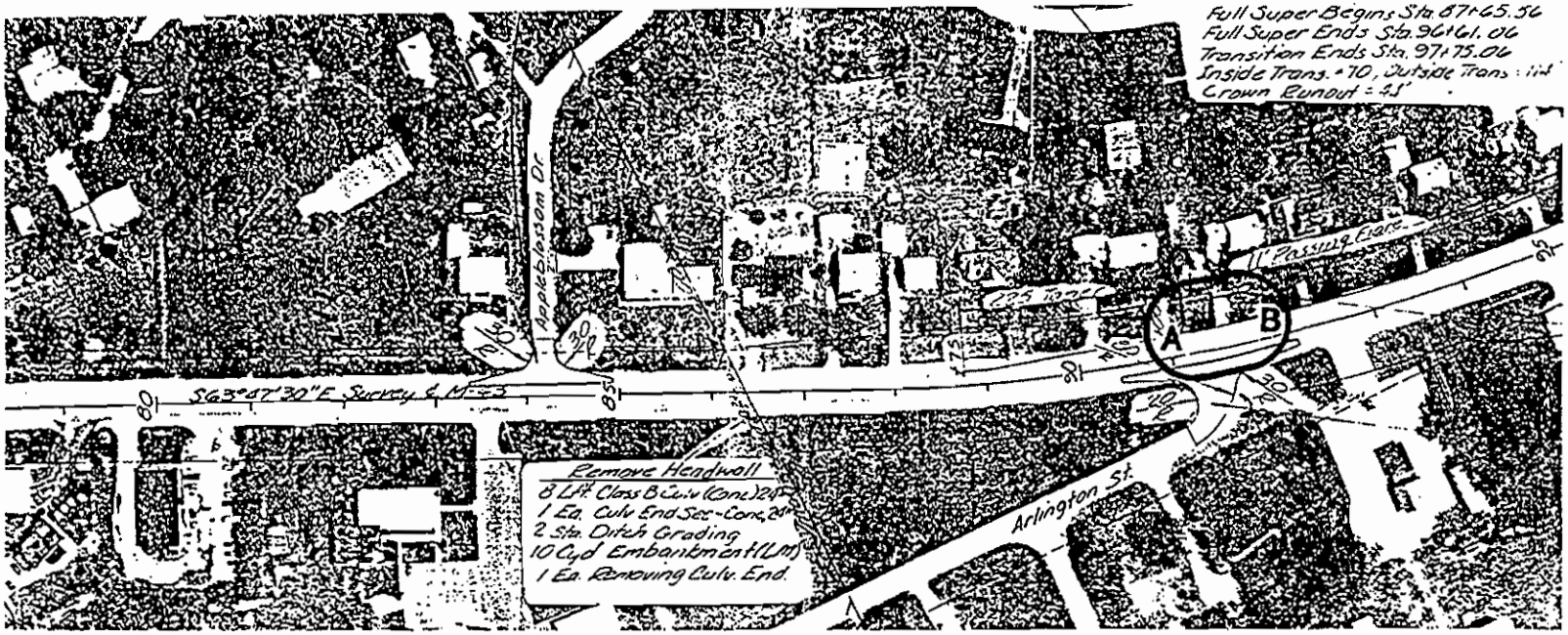
SCALE: NONE	CHECKED BY: HRP	SHEET 6 OF 6	

#4423
09-13-94



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 10: M-43 AT BANGOR

NTH CONSULTANTS, LTD.
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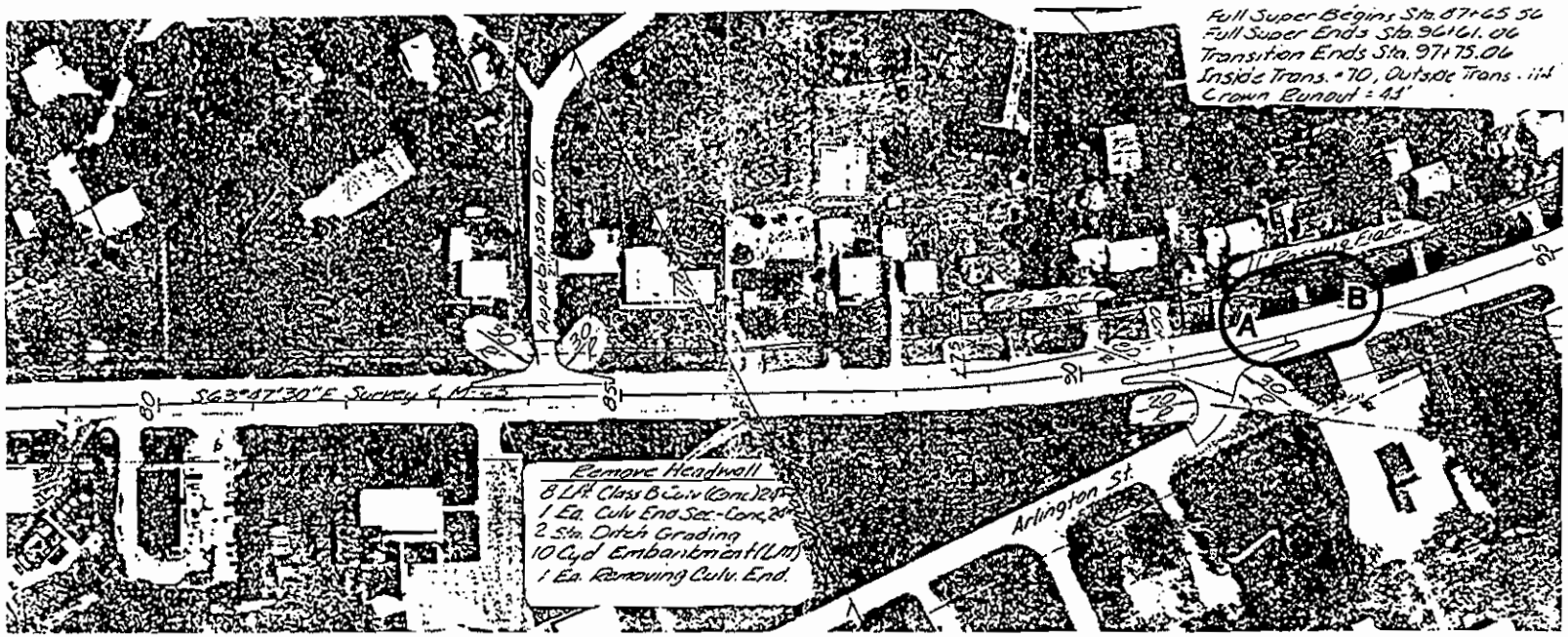
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	10-1
SCALE: NONE	CHECKED BY: HRP	SHEET 1 OF 5	

•DWGNAME
•DATE



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 10: M-43 AT BANGOR

NTH CONSULTANTS, LTD.
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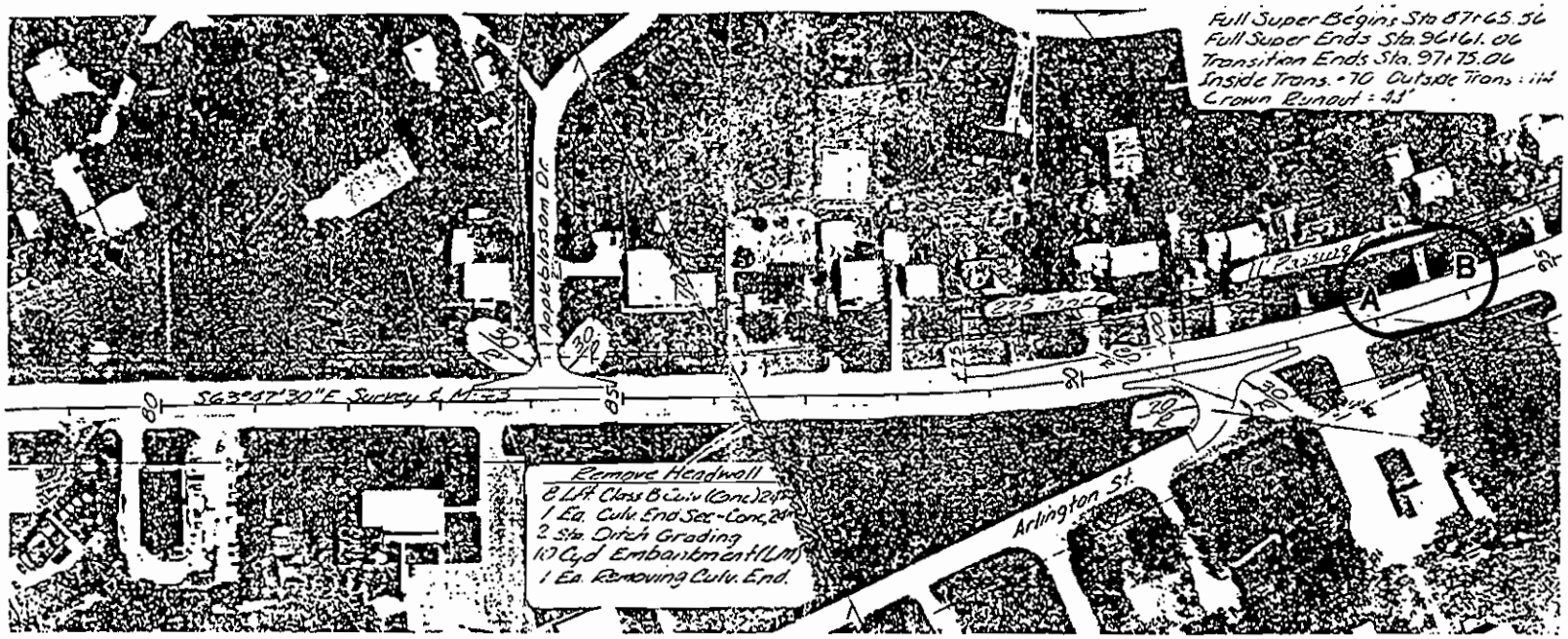
Detroit, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	10-2
SCALE: NONE	CHECKED BY: HRP	SHEET 2 OF 5	

●DWGNAME
●DATE



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 10: M-43 AT BANGOR

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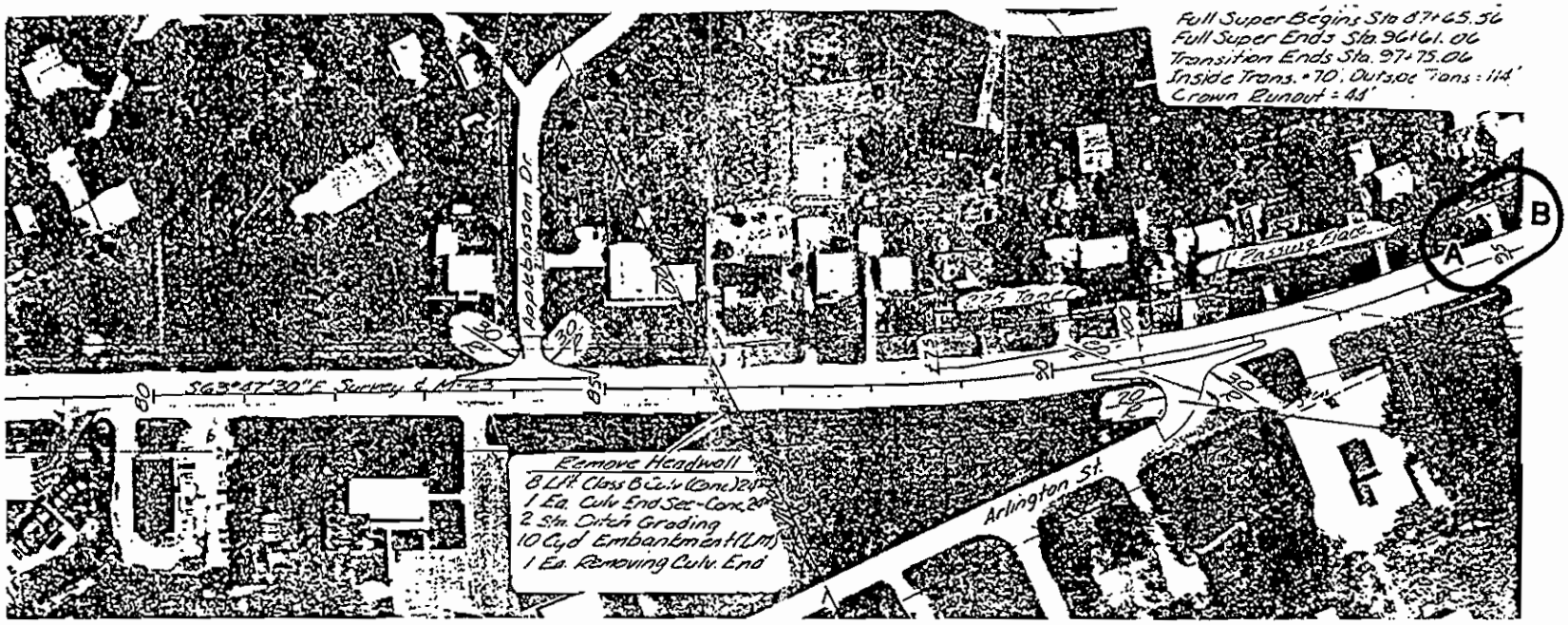
PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	10-3
SCALE: NONE	CHECKED BY: HRP	SHEET 3 OF 5	

DWGNAME
DATE



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 10: M-43 AT BANGOR

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PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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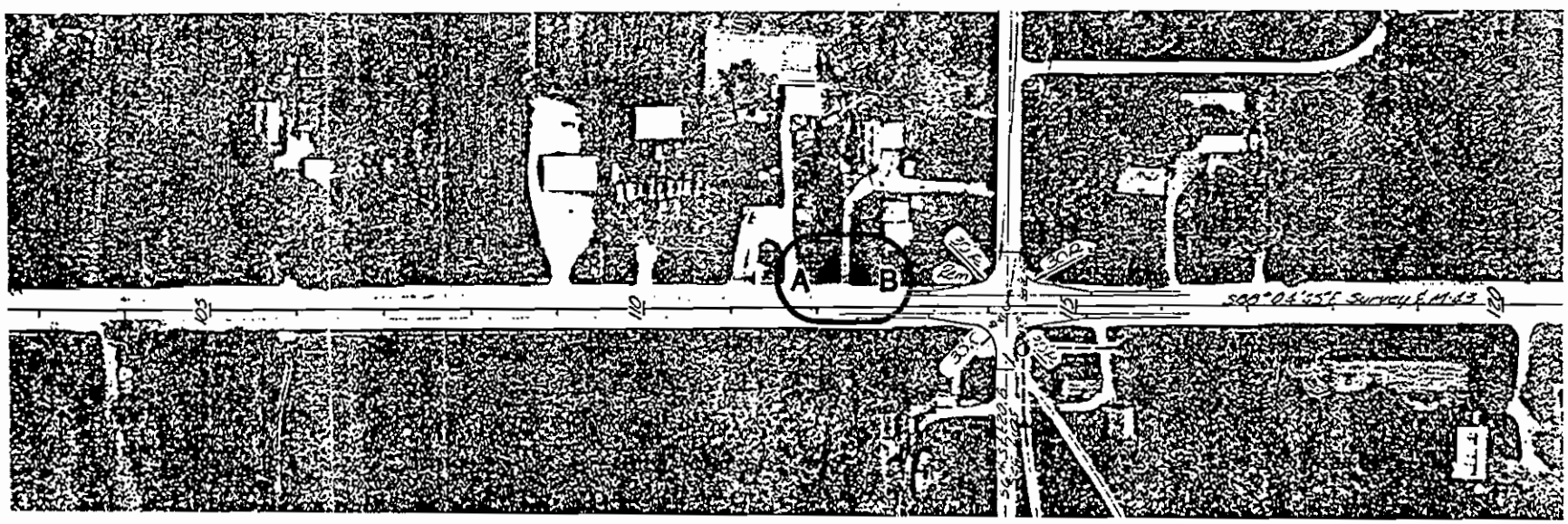
DWGNAME
DATE



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 10: M-43 AT BANGOR

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PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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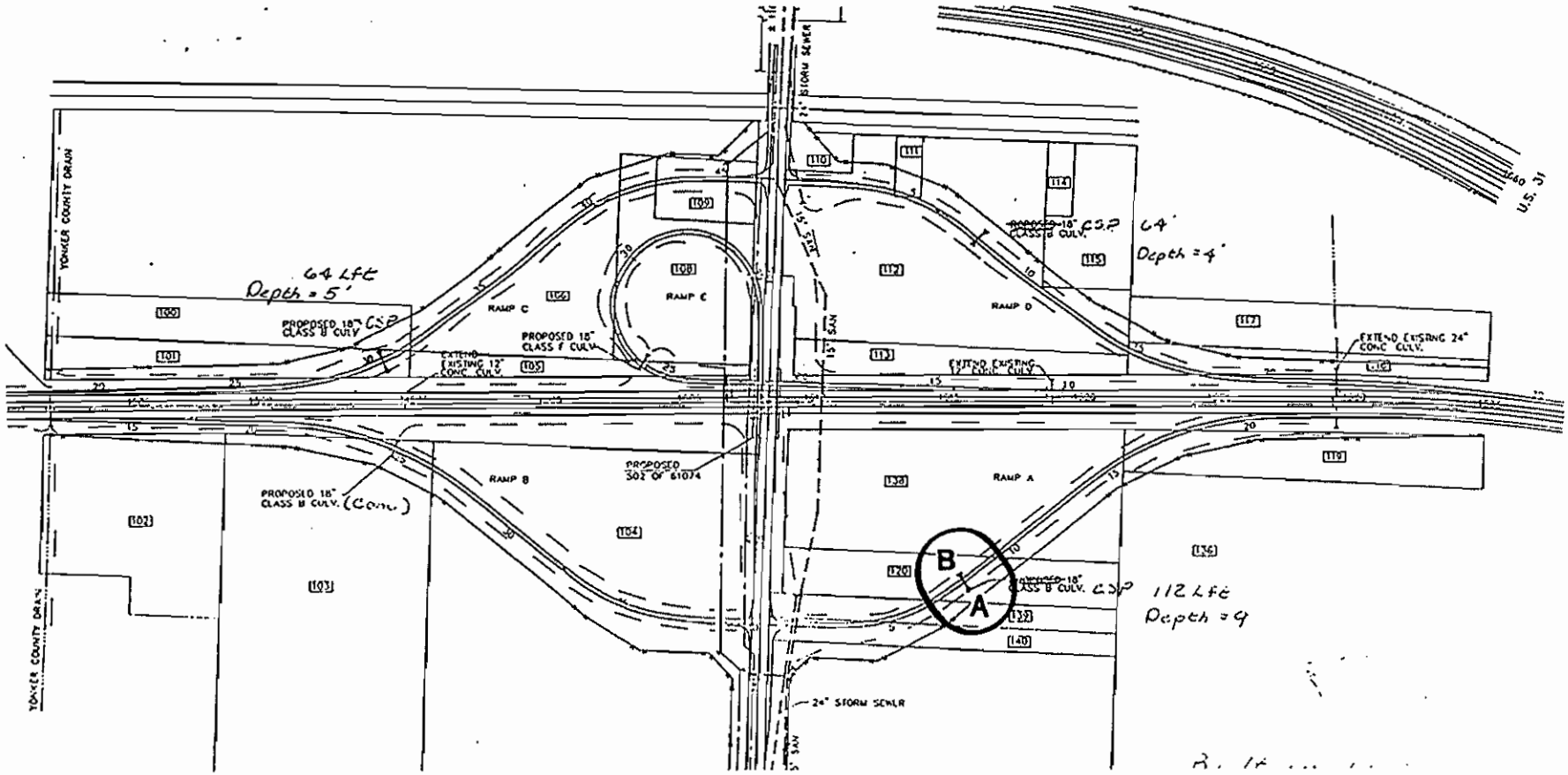
SCALE: NONE	CHECKED BY: HRP	SHEET 5 OF 5	

●DWGNAME
●DATE



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 11: US-31 AT STERNBERG ROAD INTERCHANGE

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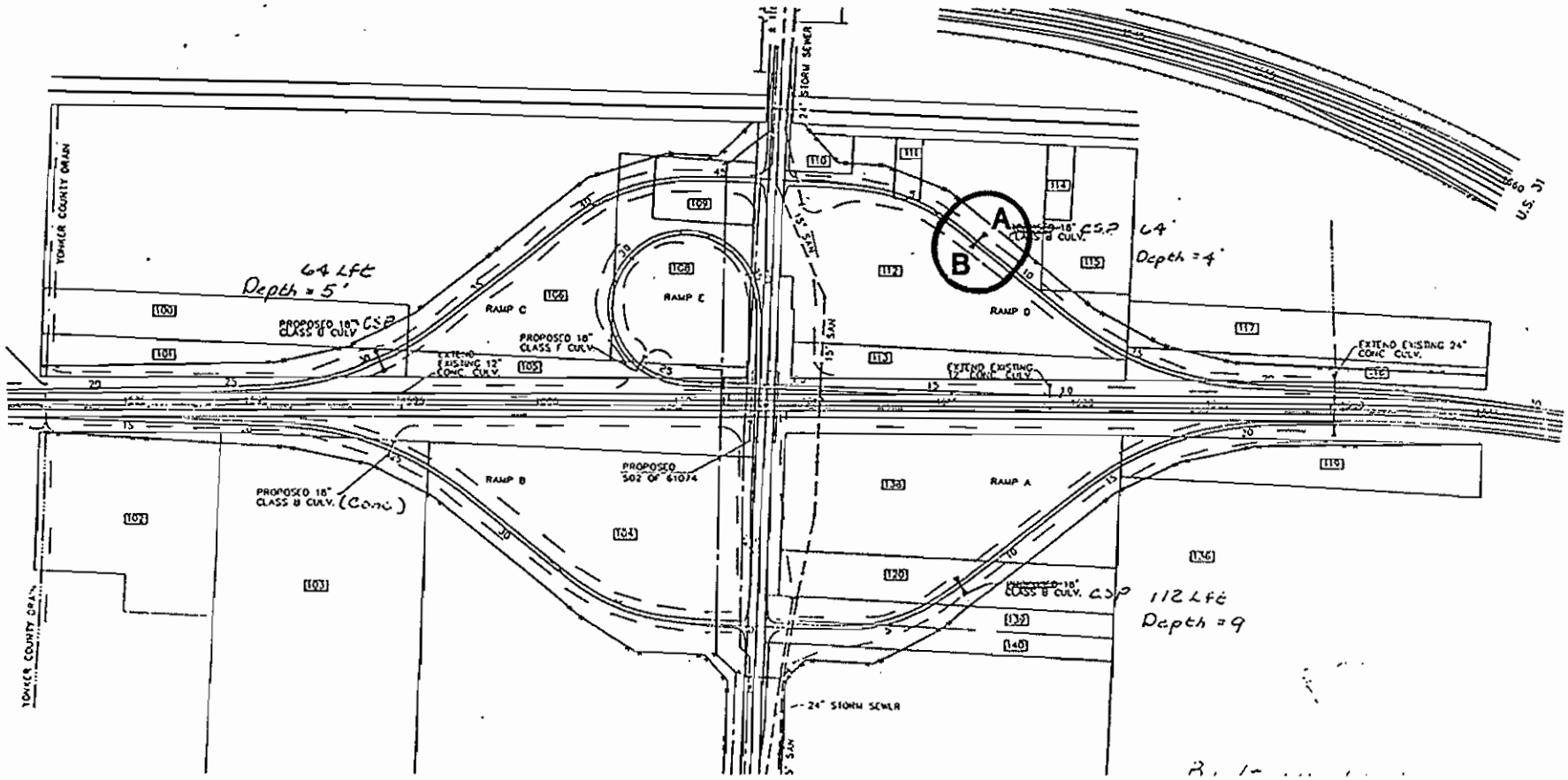
PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	11-1
SCALE: NONE	CHECKED BY: HRP	SHEET 1 OF 3	

●DWGNAME
●DATE



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 11: US–31 AT STERNBERG ROAD INTERCHANGE

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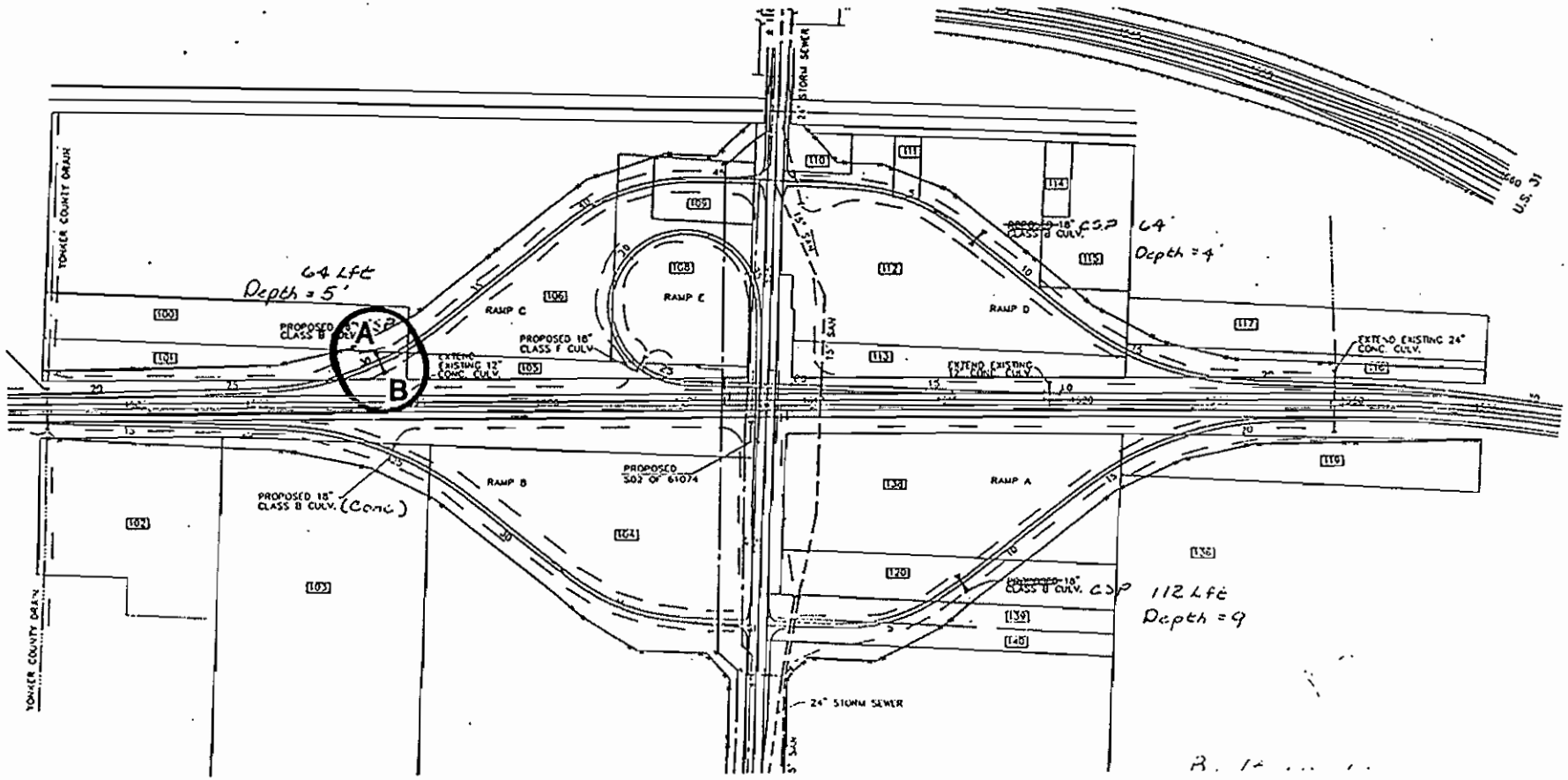
PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34–4423–00	SHB	10–06–94	11–2
SCALE: NONE	CHECKED BY: HRP	SHEET 2 OF 3	

●DWGNAME
●DATE



NORTH

PIPE SEGMENT LOCATION PLAN

MDOT PIPE INSPECTION
CONTRACT No. 2
SITE 11: US-31 AT STERNBERG ROAD INTERCHANGE

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PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
34-4423-00	SHB	10-06-94	11-3
SCALE: NONE	CHECKED BY: HRP	SHEET 3 OF 3	

DWGNAME
DATE

Roots

- *F - Fine*
- *M - Mass*
- *(J) - Joint*
- *(T) - Tap*

Line

- *DR Displaced to Right - Estimate Offset*
- *DL Displaced to Left - Estimate Offset*

Crack

CF	*Fine -*	*< 1 mm / 0.04 In.*
CM	*Medium -*	*1 mm - 2 mm (0.04 In. - 0.08 In.)*
CL	*Large -*	*> 2 mm*

- *Ln Longitudinal*
- *Tr Transverse*
- *C Circumferential*
- *M Multiple*

Grade

- *D Dip - Estimate Depth*
- *H Heave - Estimate Rise*

Deformation - Estimate to nearest 5%, collapsed pipe also estimated to nearest 5%.
D - Deformed, C - Collapsed Br - Broken

Infiltration

- *IE - Encrustion H > 20% M 5 - 20% L < 5% area*
- *IS - Seepage*
- *ID - Dripping*
- *IR - Runner - Steady Stream < 1/4 Inch in Diameter*
- *IG - Gusher - Steady Stream > 1/4 Inch in Diameter*

Debris

- *DBS - Sludge*
- *DBG - Granular (S) Sand*
  - *(G) Gravel*
  - *(S/C) Silt/Clay*

Obstruction

- *OW - Wood*
- *OC - Concrete*
- *OM - Metal*
- *OO - Other*
- *OB - Brick*

Joints

- *JO - Joint Open - Estimate Size*
- *JD - Joint Displaced - Estimate Percentage*

Estimate Relative Position by Clock Reference
Indicate Orientation of Clock Reference

Project No. 34 442300 Date: 9-22-94 Field Engineer: JIM GRANT

Site Location: GRAND RAPIDS, MICHIGAN MDOT Designation:

Beginning Point: STA 290+25 M-44

Ending Point: STA 293+00 M-44

Depth to Invert: Pipe Size: 18" Material: CONCRETE Flow Direction: A→B

Video Tape No.: 3 Counter Data: 4769-5043 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+20		CF 12:00							
1+68		CF 10:00							
1+25 TO 1+33								D 3/4"	
1+88 TO 1+96								D 1/2"	
2+30		CF 1:00							

12

EAST Direction 9 ◯ 3 WEST Direction

6

Remarks:

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: MINOR CRACKING, PIPE GENERALLY APPEARS SOUND

Repair: Replace:

Probable Causes of Observed Distress

CRACKING PROBABLY DUE TO LOCALIZED VARIATIONS IN BEDDING SUPPORT

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 2-1

Sheet 1 of 1

Project No. 34442300 Date: 9-22-94 Field Engineer: JIM GRANT

Site Location: GRAND RAPIDS, MI MDOT Designation:

Beginning Point: STA 302+00 MM-44

Ending Point: STA 303+50 MM-44

Depth to Invert: Pipe Size: 24" Material: CONCRETE Flow Direction: A→B

Video Tape No.: 3 Counter Data: 5043 - 5144 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+16 to 0+36								D 1/2"	
0+50 to 1+19								D 2"	

12

EAST Direction 9 ◯ 3 WEST Direction

6

Remarks:

Assessment:

Good Poor

(5) 4 3 2 1

Evaluation:

Repair: Replace:

Probable Causes of Observed Distress

GRADE VARIATIONS APPEAR TO BE AS INSTALLED

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 2-2

Sheet 1 of 1

Project No. 34 442300 Date: 9-22-94 Field Engineer: JIM GRANT

Site Location: GRAND RAPIDS, MICHIGAN MDOT Designation:

Beginning Point: STA 430+00 M-44

Ending Point: STA 432+40 M-44

Depth to Invert: Pipe Size: 12" Material: CONCRETE Flow Direction: A → B

Video Tape No.: 4 Counter Data: 0658 TO 1590 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+11 TO 0+13		CF 12:00							
0+17		CF 12:00							
0+22 TO 0+24		CF 1:00							
0+26 TO 0+30		CF 12:00							
0+34 TO 0+42		CF 9:00							
0+42 TO 0+47		CF 11:00							

12

NORTH Direction 9 ◯ 3 SOUTH Direction

6

Remarks:

Assessment:

Good 5 4 (3) 2 1 Poor

Evaluation: MULTIPLE CRACKS, SUGGEST PIPE DEFECTIVE

Repair: RELINE Replace:

Probable Causes of Observed Distress

CRACKING SUGGESTS POOR BEDDING OR OVERLOAD

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 3-1

Sheet 1 of 4

Project No. 34 4423 00 Date: 9-22-94 Field Engineer: Jim Grault

Site Location: Grand Rapids, Michigan MDOT Designation:

Beginning Point: STA 430+00 M-44

Ending Point: STA 432+40 M-44

Depth to Invert: Pipe Size: 12" Material: Concrete Flow Direction: A→B

Video Tape No.: 4 Counter Data: 0658 to 1590 Cleaning Method: Jet Rod

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+52 to 0+55		CF 12:00							
0+60 to 0+64		CF 1:00							
0+64 to 0+72		CM 9:00							
0+76 to 0+78		CM 3:00							
0+83 to 0+84		CF 12:00							
0+89 to 0+93		CF 3:00							

12

NORTH Direction 9 ◯ 3 SOUTH Direction

6

Remarks:

See Sheet 1 of 4

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: See Sheet 1 of 4

Repair: Replace:

Probable Causes of Observed Distress

See Sheet 1 of 4

Evaluation By: H. Price

Reviewed By: H. Price

FIGURE No. 3-1

Project No. 34 442300 Date: 9-22-94 Field Engineer: JIM GRANT

Site Location: GRAND RAPIDS, MICHIGAN MDOT Designation:

Beginning Point: STA 430+00 M-44

Ending Point: STA 432+40 M-44

Depth to Invert: Pipe Size: 12" Material: CONCRETE Flow Direction: A → B

Video Tape No.: 4 Counter Data: 0658 TO 1590 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+97 TO 1+00		CF 9:00							
1+04 TO 1+08		CF 3:00							
1+07 TO 1+10		CF 9:00							
1+30 TO 1+33		CM 12:00							
1+36 TO 1+40		CF 2:00							
1+58 TO 1+66		CM 4:00							

12
NORTH Direction 9 3 SOUTH Direction
6

Remarks:

See SHEET 1 OF 4

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: See SHEET 1 OF 4

Repair: Replace:

Probable Causes of Observed Distress

See SHEET 1 OF 4

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 3-1

Project No. 34 4423 00 Date: 9-22-94 Field Engineer:

Site Location: Grand Rapids, Michigan MDOT Designation:

Beginning Point: STA 430+00 M-44

Ending Point: STA 432+40 M-44

Depth to Invert: Pipe Size: 12" Material: Concrete Flow Direction: A → B

Video Tape No.: 4 Counter Data: 0658 to 1570 Cleaning Method: Jet Rod

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
1+69 to 1+72		CF 10:00							
1+86 to 1+92		CF 3:00							
2+04		CF 3:00							
2+08 to 2+11		CM 3:00							
2+17 to 2+29		CF 3:00							
2+17 to 2+29		CF 9:00							

12

NORTH Direction 9 ◯ 3 SOUTH Direction

6

Remarks:

See Sheet 1 of 4

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: See Sheet 1 of 4

Repair: Replace:

Probable Causes of Observed Distress

See Sheet 1 of 4

Evaluation By: H. Price

Reviewed By: H. Price

Figure No. 3-1

Project No. 34 4423 00 Date: 9-22-94 Field Engineer: JIM GRANT

Site Location: GRAND RAPIDS, MICHIGAN MDOT Designation:

Beginning Point: STA 492+50 M-44

Ending Point: STA 493+00 M-44

Depth to Invert: Pipe Size: 18" Material: CONCRETE Flow Direction: A→B

Video Tape No.: 4 Counter Data: 000 - 06[illegible] Cleaning Method: JET Rod

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+08 TO 0+10		CF 9:00							
0+21 TO 0+24		CF 12:00							
0+28 TO 0+30		CM 12:00							
0+30 TO 0+35		CF 4:00							
0+42 TO 0+45		CF 3:00							
0+45 TO 0+47		CF 3:00							

12
NORTH Direction 9 ◯ 3 SOUTH Direction
6

Remarks:

Assessment:
Good 5 4 (3) 2 1 Poor

Evaluation: CRACKING PATTERN SUGGESTS FLEXURE OF PIPE. POOR BEDDING / OVER-COMPACTION

Repair: RELINING Replace:

Probable Causes of Observed Distress
QUANTITY OF CRACKS SUGGEST BEDDING PROBLEM OR OVERCOMPACTION

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE No. 3-1

Project No. 34 442300 Date: 9-22-94 Field Engineer: JIM GRANT

Site Location: GRAND RAPIDS, MICHIGAN MDOT Designation:

Beginning Point: STA 492+50 M-44

Ending Point: STA 495+00 M-44

Depth to Invert: Pipe Size: 18" Material: CONCRETE Flow Direction: A → B

Video Tape No.: 4 Counter Data: 000 TO 0658 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+54 TO 0+56		CF 3:00							
0+60 TO 0+64		CF 1:00							
0+71 TO 0+75		CF 9:00							
0+75 TO 0+82		CF 2:00							
0+91 TO 0+93		CF 12:00							
1+00 TO 1+04		CF 5:00							

12

NORTH Direction 9 3 SOUTH Direction

6

Remarks:

See SHEET 1 OF 4

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: See SHEET 1 OF 4

Repair: Replace:

Probable Causes of Observed Distress

See SHEET 1 OF 4

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE No. 3-2

Project No. 34 4423 00 Date: 9-22-94 Field Engineer: JIM GRANT

Site Location: GRAND RAPIDS, MICHIGAN MDOT Designation:

Beginning Point: STA 492+50 M-44

Ending Point: STA 495+00 M-44

Depth to Invert: Pipe Size: 18" Material: CONCRETE Flow Direction: A→B

Video Tape No.: 4 Counter Data: 000 TO 0655 Cleaning Method: JET RAD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
1+08 to 1+12		CF 9:00							
1+14 TO 1+20		CF 6:00							
1+24 to 1+30		MCF 10:00							
1+33 TO 1+36		CF 9:00							
1+45 TO 1+51		CF 12:00							
1+55 TO 1+59		CF 11:00							

12
NORTH Direction 9 3 SOUTH Direction
6

Remarks:

See Sheet 1 of 4

Assessment:
Good 5 4 3 2 1 Poor

Evaluation: See Sheet 1 of 4

Repair: Replace:

Probable Causes of Observed Distress

See Sheet 1 of 4

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE No. 3-2

Project No. 34-442300 Date: 9-22-94 Field Engineer: JIM GRANT

Site Location: GRAND RAPIDS, MICHIGAN MDOT Designation:

Beginning Point: STA 492+50 M-44

Ending Point: STA 495+00 M-44

Depth to Invert: Pipe Size: 18" Material: CONCRETE Flow Direction: A→B

Video Tape No.: 4 Counter Data: 000 TO 0658 Cleaning Method: JET 1200

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
1+63 TO 1+67		CF 3:00							
1+74 TO 1+78		CF 9:00							
1+94		CF 9:00							
2+02 TO 2+04		CF 11:00							

12

NORTH Direction 9 3 SOUTH Direction

6

Remarks: See Sheet 1 OF 4

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: See Sheet 1 of 4

Repair: Replace:

Probable Causes of Observed Distress

See Sheet 1 OF 4

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 3-2

Sheet 4 of 4

Project No. 34 442300 Date: 9-21-94 Field Engineer: JIM GRANT

Site Location: KALAMAZOO, MI MDOT Designation:

Beginning Point: US-131 BR STA 88+00

Ending Point: US-131 BR STA 89+65

Depth to Invert: Pipe Size: 12" Material: CONCRETE Flow Direction: A→B

Video Tape No.: 3 Counter Data: 2506 TO 2714 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12

WEST Direction 9 ◯ 3 EAST Direction

6

Remarks:

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE APPEARS TO BE GOOD, NO DISTRESS NOTED

Repair: Replace:

Probable Causes of Observed Distress

Evaluation By: H. PRICE

H. PRICE

Project No. 34 4423 00 Date: 9-21-94 Field Engineer: JIM GRANT

Site Location: KALAMAZOO, MICHIGAN MDOT Designation:

Beginning Point: US-131 BR STA 91+94

Ending Point: US 131 BR STA 93+85

Depth to Invert: Pipe Size: 15" Material: CONCRETE Flow Direction: A→B

Video Tape No.: 3 Counter Data: 2714 TO 3011 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+38 to 0+41		CF 2:00							
0+44 to 0+46		CF 12:00							
1+09 to 1+10		CF/M 5:00							
1+78		CF 10:00							
1+78								D 3/8"	
1+81 to 1+84		CF 2:00							

12

WEST Direction 9 ◯ 3 EAST Direction

6

Remarks: MINOR CRACKING

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: FAIR TO GOOD

Repair: MONITOR Replace:

Probable Causes of Observed Distress

CRACKS MAY BE THE RESULT OF LOCALIZED OVERSTRESS OR IRREGULARITY IN BEDDING SUPPORT

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. U-2 Sheet 1 of 1

Project No. 34 442300 Date: 9-20-94 Field Engineer: JIM GRANT

Site Location: PORTAGE MICHIGAN MDOT Designation:

Beginning Point: I-94 STA 260+90

Ending Point: I-94 STA 263+00

Depth to Invert: Pipe Size: 12" Material: POLYETHYLENE * Flow Direction: A → B

Video Tape No.: 3 Counter Data: 1270 TO 1575 Cleaning Method: JET ROD

* CONCRETE END SECTIONS

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+04							45° LEFT		J 0 1"
0+26							22 1/2° RT		
0+54								D 1/2"	
1+04								D 1/2"	
1+12								D 1/2"	
1+30								D 1/2"	

12
NORTH Direction 9 3 SOUTH Direction
6

Remarks: NO MANDREL due TO BENDS

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: OVERALL FAIR TO GOOD. 45° BENDS MAY TRAP DEBRIS WITH TIME

Repair: Replace:

Probable Causes of Observed Distress

DIPS APPEAR to BE FROM ORIGINAL INSTALLATION

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 5-1

Sheet 1 of 2

Project No. 34 442300 Date: 9-20-94 Field Engineer: JIM GRANT

Site Location: PORTAGE, MICHIGAN MDOT Designation:

Beginning Point: I-94 STA 260+90

Ending Point: I-94 STA 263+00

Depth to Invert: Pipe Size: 12" Material: Poly Ethylene* Flow Direction: A → B

Video Tape No.: 3 Counter Data: 1270 TO 1575 Cleaning Method: Jet Rod

Observations: * CONCRETE END SECTIONS

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
1+50								D 1/2"	
1+58								D 1/2"	
1+81							22 1/2° R		
1+96								D 1/2"	
2+09							45° L		JO 1"

12

NORTH Direction 9 3 SOUTH Direction

6

Remarks:

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: See Sheet 1 OF 2

Repair: Replace:

Probable Causes of Observed Distress

See Sheet 1 of 2

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 5-1

Sheet 2 of 2

Project No. 34442300 Date: 9-20-94 Field Engineer: JIM GRANT

Site Location: PORTAGE MICHIGAN MDOT Designation:

Beginning Point: I-94 STA 343+90

Ending Point: I-94 STA 345+00

Depth to Invert: Pipe Size: 12" Material: POLYETHYLENE Flow Direction: A → B

Video Tape No.: 3 Counter Data: 1575 TO 1802 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+17 TO 0+35								ft 10%	
1+51								D 1/2"	

12

NORTH Direction 9 3 SOUTH Direction

6

Remarks: MANDREL OK

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: Pipe Appears to be structurally sound, Passed MANDREL TEST. GRADE FROM 17 TO 35 SHOULD BE CHECKED

Repair: Replace:

Probable Causes of Observed Distress

DIP AND GRADE CHANGE APPEAR TO BE AS INSTALLED CONDITIONS

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE No. 5-2

Sheet 1 of 1

Project No. 34 442300 Date: 9-20-94 Field Engineer: JIM GRAUT

Site Location: PORTAGE MICHIGAN MDOT Designation:

Beginning Point: I-94 STA 351+40

Ending Point: I-94 STA 353+70

Depth to Invert: Pipe Size: 12" Material: Polyethylene Flow Direction: A → B

Video Tape No.: 3 Counter Data: 1802 to 2276 Cleaning Method: Jet Rod

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+14 to 0+25								Slope Down	
0+25								D 1/2"	
0+36 to 0+39								D 1/2"-3/4"	
0+49 to 0+58								D 1/2"	
0+62 to 0+67								D 1/2"	
0+71								H 2-3"	

12

NORTH Direction 9 ◯ 3 SOUTH Direction

6

Remarks: LINE & GRADE VARY CONSIDERABLY ALONG PIPE ALIGNMENT, MANDREL FROM B TO A 157', FROM A TO B 123'

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: WITH EXCEPTION OF OFFSET JOINT AT 1+30 & 1+31, STRUCTURALLY LOOKS GOOD

Repair: Replace:

Probable Causes of Observed Distress

PIPE DISTORTED NEAR OFFSET JOINT, SUGGESTS SOME MOVEMENT. MAJORITY OF GRADE AND ALIGNMENT PROBLEMS APPEAR TO BE ORIGINAL INSTALLATION PROBLEMS

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE No. 5-3

Project No. 34 44 23 00 Date: 9-20-94 Field Engineer: JIM GRANT

Site Location: PORTAGE, MICHIGAN MDOT Designation:

Beginning Point: I-94 STA 351+40

Ending Point: I-94 STA 353+70

Depth to Invert: Pipe Size: 12" Material: POLYETHYLENE Flow Direction: A → B

Video Tape No.: 3 Counter Data: 1802 TO 2278 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+83 to 0+85								D 1/2"	
0+91								H 2"	
1+30									OJ 1/2" V
1+31									OJ 1/2" V
1+35 - 1+48								D 1/2"	
1+61 to 1+68								D 1/2"	

NORTH Direction — 12 / 9 / 3 / 6 — SOUTH Direction

Remarks:

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: See SHEET 1 OF 3

Repair: Replace:

Probable Causes of Observed Distress

See SHEET 1 OF 3

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE No. 5-3

Project No. 34 442300 Date: 9-20-94 Field Engineer: JIM GRALIT

Site Location: PORTAGE, MICHIGAN MDOT Designation:

Beginning Point: I-94 STA 351+40

Ending Point: I-94 STA 353+70

Depth to Invert: Pipe Size: 12" Material: POLYETHYLENE Flow Direction: A→B

Video Tape No.: 3 Counter Data: 1802 TO 2276 Cleaning Method: JET 120D

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
1+79 to 1+87								D 1/2"	
1+97 to 2+02								SLOPE	
2+24 to 2+27								D 1/2"	
2+34 to 2+50								D 2"	
2+57 to 2+62								D 3-4"	

12

NORTH Direction 9 3 SOUTH Direction

6

Remarks:

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: See Sheet 1 of 3

Repair: Replace:

Probable Causes of Observed Distress

See Sheet 1 of 3

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 5-3

Sheet 3 of 3

Project No. 34 442300 Date: 9-20-94 Field Engineer: JIM GRANT

Site Location: PORTAGE, MICHIGAN MDOT Designation:

Beginning Point: I-94 STA 393+00

Ending Point: I-94 STA 391+00

Depth to Invert: Pipe Size: 12" Material: POLYETHYLENE Flow Direction: A ← B

Video Tape No.: 3 Counter Data: 2278 - 2510 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+00 TO 0+15								D 3/4"	
0+22 TO 0+33								D 3/4	
0+71 TO 0+73								D 3/8"	

12

SOUTH Direction 9 ◯ 3 NORTH Direction

6

Remarks:

MANDRELL FROM B TO A 34', FROM A TO B 36'

SCRAPES between 9:00 & 11:00

STARTING AT STA 100+00

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: PIPE HAS 3 dips MANDREL TEST INDICATES deformation AT 34' IN FROM B and 36' IN FROM A

Repair: Replace:

Probable Causes of Observed Distress

MANDREL TEST + SCRAPE MARKS Between STA 1+00 and 1+97 SUGGEST Possible Settlement. DIPS APPEAR to Be AS CONSTRUCTED CONDITION

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE No. 5-5 Sheet 1 of 1

Project No. 34-4423-00 Date: 9-19-94 Field Engineer: JIM GRANT

Site Location: BERRIEN SPRINGS MDOT Designation:

Beginning Point: US-31 STA 748+00 NORTHBOUND

Ending Point:

Depth to Invert: Pipe Size: 15" Material: POLYETHYLENE Flow Direction: A→B

Video Tape No.: 3 Counter Data: 0805-1071 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+22 TO 0+35									
0+48 TO 0+94									

12
WEST Direction 9 ◯ 3 EAST Direction
6

Remarks: 0+22 - 0+35 1-2" DIP, 0+48 to 0+94 GRADES TO 5" DIP NEAR MANHOLE B. MANDREL FROM B TOWARDS A 77' AND A TOWARDS B 11'

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: 6 FEET DEFORMED 0+11 TO 0+17 FROM A. FAIR TO GOOD OVERALL

Repair: — Replace: —

Probable Causes of Observed Distress

GRADE PROBLEMS APPEAR TO BE FROM ORIGINAL INSTALLATION. DEFORMATION IS ON CROWN PROBABLE OVERSTRESS DURING INSTALLATION

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 61

Sheet 1 of 1

Project No. 34442300 Date: 9/19/94 Field Engineer: JIM GRANT

Site Location: BERRIEN SPRINGS MDOT Designation:

Beginning Point: US-31 STA. 753+10 NORTH BOUND

Ending Point:

Depth to Invert: Pipe Size: 24" Material: CONCRETE Flow Direction: A→B

Video Tape No.: 3 Counter Data: 06/2 700605 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+00 to 0+50								D	
0+75								H	

12
WEST Direction 9 ○ 3 EAST Direction
6

Remarks: 2" DIP 0+00 TO 0+50
1" RISE TO STA 0+75

Assessment:
Good 5 (4) 3 2 1 Poor

Evaluation: PIPE APPEARS TO BE STRUCTURALLY SOUND, MINOR GRADE PROBLEMS

Repair: Replace:

Probable Causes of Observed Distress
PIPE GRADE APPEARS TO BE 1½ - BUILT CONDITION

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 6-2

Sheet 1 of 1

Project No. 34 4423 00 Date: 9/19/94 Field Engineer: JIM GRANT

Site Location: BERRIEN SPRINGS MDOT Designation:

Beginning Point: US-31 SOUTHBOUND STA 753+10

Ending Point:

Depth to Invert: Pipe Size: 24" Material: CONCRETE Flow Direction: A→B

Video Tape No.: 3 Counter Data: 0360 - 0612, Cleaning Method: Jet Rod

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12

WEST Direction 9 ◯ 3 EAST Direction

6

Remarks: 2 AREAS OF APPARENT CRACKING WERE NOTED ON FIELD INSPECTION UPON REVIEW THESE APPEAR TO BE CLEANING MARKS NOT CRACKS

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION

Repair: Replace:

Probable Causes of Observed Distress

N/A

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 6-3

Sheet 1 of 1

Project No. 34 4423 00 Date: 9/19/94 Field Engineer: JIM GRANT

Site Location: BERRIEN SPRINGS MDOT Designation:

Beginning Point: US-31 STA 767+00 SOUTHBOUND

Ending Point:

Depth to Invert: Pipe Size: 24" Material: CONCRETE Flow Direction: A→B

Video Tape No.: 3 Counter Data: 000-0360 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+98 TO 1+20								D	
1+30 TO 1+40								D	
1+97 - 201		CF/M M							

12

WEST Direction 9 ◯ 3 EAST Direction

6

Remarks: MASTIC INTRUSION AT MOST JOINTS. DIPS Approximately 1 1/2 INCHES Deep. 1+97 MULTIPLE CRACKS ON CROWN

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: PIPE IN GENERALLY GOOD CONDITION. DIPS APPEAR TO BE ORIGINAL GRADE

Repair: MONITOR Replace:

Probable Causes of Observed Distress

CRACKING 1+97 TO 2+01 APPEARS to be LOCALIZED STRESS CONCENTRATION NO OFFSET OF CRACK NOTED

Evaluation By: HRP

Reviewed By: HRP

FIGURE NO. 6-4

Sheet 1 of 1

Project No. 34 4423 00 Date: 9-19-94 Field Engineer: JIM GRANT

Site Location: BERRIEN SPRINGS MDOT Designation:

Beginning Point: US-31 STA 772+50 North Bound

Ending Point:

Depth to Invert: Pipe Size: 15" Material: POLYETHYLENE Flow Direction: A←B

Video Tape No.: 3 Counter Data: 1105 - 1270 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+14 to 0+19								D	

12

EAST Direction 9 ◯ 3 WEST Direction

6

Remarks: DIP APPROXIMATELY 1/2 INCH. MANDREL FROM B 19 FEET TOWARDS A AND 7 FEET FROM A TOWARDS B. NO OBVIOUS DEFORMATION

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: DIP AND MANDREL INDICATED DEFORMATION APPEAR TO BE ORIGINAL CONSTRUCTION

Repair: Replace:

Probable Causes of Observed Distress

GRADE MAY HAVE BEEN SLIGHTLY LOW DURING INSTALLATION. PROBABLE LOCALIZED OVERSTRESS INDICATED BY MANDREL

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 6-5

Sheet 1 of 1

Project No. 34 4423 00 Date: 9-22-94 Field Engineer: JIM GRANT

Site Location: HUDSONVILLE, MICHIGAN MDOT Designation:

Beginning Point: STA 531+50 OLD M-21

Ending Point: STA 532+75

Depth to Invert: Pipe Size: 18" Material: CMP Flow Direction: A←B

Video Tape No.: 3 Counter Data: 4631-4769 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+19 TO 0+28								D 1/2"	
0+43 TO 0+48								D 1/2"	
0+70 TO 1+19								D 1 1/2"	

12

SOUTH Direction 9 ◯ 3 NORTH Direction

6

Remarks:

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: FAIR, 0+70 TO 1+19 LOWER

Repair: MONITOR Replace:

Probable Causes of Observed Distress

DIPS APPEAR TO BE AS INSTALLED. GRADES AT 1+19 APPEAR TO BE LOW

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 7-1 Sheet 1 of 1

Project No. 34 442300 Date: 9-22-94 Field Engineer: Jim GRANT

Site Location: HUDSONVILLE, MICHIGAN MDOT Designation:

Beginning Point: STA 544+30 OLD M-21

Ending Point: STA 545+65

Depth to Invert: Pipe Size: 18" Material: CMP Flow Direction: A→B

Video Tape No.: 3 Counter Data: 4412-4631 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+77 TO 0+85								D 2"	
1+12			D 11:00 2-3"						
1+14 TO 1+26								D 2"	

12

SOUTH Direction 9 ◯ 3 NORTH Direction

6

Remarks:

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: DENT IS APPROIMATELY 30 INCHES IN DIAMETER

Repair: MONITOR Replace:

Probable Causes of Observed Distress

DENT AND DIPS APPEAR TO BE AS INSTALLED CONDITIONS. DENT PROBABLY CAUSED BY IMPACT ON PIPE DURING BACKFILL

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 7-2

Sheet 1 of 1

Project No. 34 4423 00 Date: 9-23-94 Field Engineer: JIM GRANT

Site Location: WACOUSTA, MICHIGAN MDOT Designation:

Beginning Point: STA 373+00 I-96

Ending Point:

Depth to Invert: Pipe Size: 12" Material: CONCRETE Flow Direction: A → B

Video Tape No.: 5 Counter Data: 0+00 TO 0299 Cleaning Method: Jet Rod

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+26		MCF 1:00							
0+43 TO 0+50								D 1"	

WEST Direction — 12 / 9 / 3 / 6 — EAST Direction

Remarks:

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: PIPE APPEARS TO BE GOOD WITH EXCEPTION OF MINOR CRACKING

Repair: MONITOR Replace:

Probable Causes of Observed Distress

GRADE PROBLEMS DURING INSTALLATION

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 8-1

Sheet 1 of 1

Project No. 34 442300 Date: 9-21-94 Field Engineer: Jim GRANT

Site Location: SOUTH HAVEN, MICHIGAN MDOT Designation:

Beginning Point: STA 1437+60 North Bound I-196 #1

Ending Point:

Depth to Invert: Pipe Size: 12" Material: CMP Flow Direction: A→B

Video Tape No.: 3 Counter Data: 3287-3457 Cleaning Method: Jet Rod

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12

NORTH Direction 9 ◯ 3 SOUTH Direction

6

Remarks:

Assessment:

Good (5) 4 3 2 1 Poor

Evaluation:

Repair: Replace:

Probable Causes of Observed Distress

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 9-1 Sheet 1 of 1

Project No. 34 4423000 Date: 9-21-94 Field Engineer: JIM GRANT

Site Location: SOUTHHAVEN, MICHIGAN MDOT Designation:

Beginning Point: STA 1437+60 NORTHBOUND I-196 - #2

Ending Point:

Depth to Invert: Pipe Size: 12" Material: CMP Flow Direction: A→B

Video Tape No.: 3 Counter Data: 3457-3601 Cleaning Method: JETTED

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12

NORTH Direction 9 ◯ 3 SOUTH Direction

6

Remarks:

Assessment:

Good Poor

(5) 4 3 2 1

Evaluation:

Repair: Replace:

Probable Causes of Observed Distress

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 9-2 Sheet 1 of 1

Project No. 34 442300 Date: 9-21-94 Field Engineer: Jim Grant

Site Location: South Haven, Michigan MDOT Designation:

Beginning Point: Sta 1437+60 North Bound I-196 #3

Ending Point:

Depth to Invert: Pipe Size: 12" Material: CMP Flow Direction: A → B

Video Tape No.: 3 Counter Data: 3601-3711 Cleaning Method: Jet Rod

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12

North Direction 9 3 South Direction

6

Remarks:

Assessment:

Good (5) 4 3 2 1 Poor

Evaluation:

Repair: Replace:

Probable Causes of Observed Distress

Evaluation By: H. Price

Reviewed By: H. Price

FIGURE No. 9-3 Sheet 1 of 1

Project No. 34 4423000 Date: 9-21-94 Field Engineer: JIM GRANT

Site Location: SOUTH HAVEN, MICHIGAN MDOT Designation:

Beginning Point: STA 1437+10 SOUTHBOUND I-196 #4

Ending Point:

Depth to Invert: Pipe Size: 12" Material: CMP Flow Direction: A→B

Video Tape No.: 3 Counter Data: 3711 - 3852 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12

SOUTH Direction 9 ◯ 3 NORTH Direction

6

Remarks:

Assessment:

Good (5) 4 3 2 1 Poor

Evaluation:

Repair: Replace:

Probable Causes of Observed Distress

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 9-4 Sheet 1 of 1

Project No. 34 442300 Date: 9-21-94 Field Engineer:

Site Location: SOUTH HAVEN, MICHIGAN MDOT Designation:

Beginning Point: STA 1437+10 NORTH BOUND I-196 #5

Ending Point:

Depth to Invert: Pipe Size: 12" Material: CMP Flow Direction: A→B

Video Tape No.: 3 Counter Data: 3852- 3992 Cleaning Method: Jet Rod

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+09									JD up 1/2"
0+29									JD up 1/4"
0+49									JD up 1/2"

12
SOUTH Direction 9 ◯ 3 NORTH Direction
6

Remarks:

Assessment:
Good 5 (4) 3 2 1 Poor

Evaluation: WITH EXCEPTION OF VARIATION AT JOINTS PIPE IS IN GOOD CONDITION

Repair: MONITOR, RELINE IF DISTRESS DEVELOPS Replace:

Probable Causes of Observed Distress
OFFSETS APPEAR TO BE AS CONSTRUCTED

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 9-5 Sheet 1 of 1

Project No. 34 4423 +00 Date: 9-21-94 Field Engineer: JIM GRANT

Site Location: SOUTH HAVEN, MICHIGAN MDOT Designation:

Beginning Point: STA 1437+10 NORTHBOUND I-196 #6

Ending Point:

Depth to Invert: Pipe Size: 12" Material: CMP Flow Direction: A → B

Video Tape No.: 3 Counter Data: 3992 - 4113 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+10									JD 1/4" VERT
0+29									JD 1/4" VERT

12

SOUTH Direction 9 ◯ 3 NORTH Direction

6

Remarks:

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION EXCEPT AT JOINTS NOTED

Repair: MONITOR RUNS IF DISTRESS DEVELOPS Replace:

Probable Causes of Observed Distress

OFFSET APPEARS TO AS CONSTRUCTED

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE No. 9-6 Sheet 1 of 1

Project No. 34 442300 Date: 9-21-94 Field Engineer: JIM GRANT

Site Location: BANGOR, MICHIGAN MDOT Designation:

Beginning Point: M-43 STA 91+49

Ending Point:

Depth to Invert: Pipe Size: 12" Material: CMP Flow Direction: A←B

Video Tape No.: 3 Counter Data: * END OF TAPE Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
30FT								D	

12

NORTH Direction 9 3 SOUTH Direction

6

Remarks: * SEGMENT OF TAPE WAS RECOVERED AFTER BEING TAPED OVER.

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION

Repair: Replace: N/A

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Reviewed By: L. QUICK

FIGURE NO. 10-1

Sheet 1 of 1

Project No. 34 442300 Date: 9-21-94 Field Engineer: JIM GRANT

Site Location: BANGOR, MICHIGAN MDOT Designation:

Beginning Point: M-43 STA 92+43

Ending Point:

Depth to Invert: Pipe Size: 12" Material: CMP Flow Direction: A←B

Video Tape No.: 3 Counter Data: 3211-3286 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+20 TO 0+23			D 0.2%						
0+33 TO 0+34			D 0.2%						

12

NORTH Direction 9 3 SOUTH Direction

6

Remarks:

2 AREAS OF MINOR DEFORMATION STONES PUSHED INTO SIDE OF PIPE. PIPE DIMPLED AT AGGREGATE CONTACT

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: GENERALLY GOOD

Repair: MONITOR DEFORMED SECTIONS FOR FUTURE CORROSION Replace:

Probable Causes of Observed Distress

LOCALIZED OVERSTRESS DURING BACKFILLING

Evaluation By: H. PRICE

Project No. 34 4423 00 Date: 9-21-94 Field Engineer: JIM GRANT

Site Location: BANGOR, MICHIGAN MDOT Designation:

Beginning Point: M-43 STA 93+75

Ending Point:

Depth to Invert: Pipe Size: 12" Material: CMP Flow Direction: A←B

Video Tape No.: 3 Counter Data: 3142 - 3211 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12

NORTH Direction 9 ◯ 3 SOUTH Direction

6

Remarks:

Assessment:

Good Poor

(5) 4 3 2 1

Evaluation: GOOD, SOIL BUILDUP SUGGESTS DRAINAGE IS PONDING - NEEDS POSSIBLE DITCH REGRADING

Repair: Replace:

Probable Causes of Observed Distress

Evaluation By: H. PRICE

H. PRICE

FIGURE NO. 10-3 Sheet 1 of 1

Project No. 34442300 Date: 9-21-94 Field Engineer: JIM GRANT

Site Location: BANGOR, MICHIGAN MDOT Designation:

Beginning Point: M-43 STA 91+49

Ending Point:

Depth to Invert: Pipe Size: 12" Material: CMP Flow Direction: A←B

Video Tape No.: 3 Counter Data: * END OF TAPE Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
30FT								D	

NORTH Direction — 12 / 9 / 3 / 6 — SOUTH Direction

Remarks: * SEGMENT OF TAPE WAS RECOVERED AFTER BEING TAPED OVER.

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: PIPE IN GOOD CONDITION

Repair: Replace: N/A

Probable Causes of Observed Distress

Evaluation By: L. QUICK

Project No. 34 442300 Date: 9-21-94 Field Engineer: JIM GRANT

Site Location: BANGOR, MICHIGAN MDOT Designation:

Beginning Point: M-43 STA 95+20

Ending Point:

Depth to Invert: Pipe Size: 12" Material: CMP Flow Direction: A←B

Video Tape No.: 3 Counter Data: 3079-3142 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+21 TO 0+26			D 0.2%						
0+32 TO 0+34			D 0.2%						

12

NORTH Direction 9 ◯ 3 SOUTH Direction

6

Remarks:

LOCALIZED DAMAGE BOTH AREAS - STONE FILL PUSHED INTO SIDE PIPE DIMPLED AT AGGREGATE CONTACT

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: GENERALLY GOOD,

Repair: MONITOR DEFORMED SECTIONS FOR FUTURE CORROSION Replace:

Probable Causes of Observed Distress

LOCALIZED OVERSTRESS DURING BACKFILLING

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 10-4 Sheet 1 of 1

Project No. 34 4423 00 Date: 9-21-94 Field Engineer: JIM GRANT

Site Location: BANGOR, MI MDOT Designation:

Beginning Point: M-43 STA 112+35

Ending Point:

Depth to Invert: Pipe Size: 12" Material: CMP Flow Direction: A←B

Video Tape No.: 3 Counter Data: 3011 TO 3079 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+19			D 0.5%						
0+23			D 0.5%						

12

NORTH Direction 9 ◯ 3 SOUTH Direction

6

Remarks: LOCALIZED DEFORMATION AT CROWN AT BOTH LOCATIONS

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: PIPE HIT during BACKFILLING

Repair: N/A Replace:

Probable Causes of Observed Distress

DAMAGED DURING BACKFILLING

Evaluation By: H. PRICE

Reviewed By: H. PRICE

FIGURE NO. 10-5

Sheet 1 of 1

Project No. 34 4423 00 Date: 9-21-94 Field Engineer: Jim Grant

Site Location: Norton Shores, Michigan MDOT Designation:

Beginning Point: STA 7+90 NORTHBOUND US-31 RAMP A STERNBERG INTERCHANGE

Ending Point:

Depth to Invert: Pipe Size: 18" Material: CMP Flow Direction: A ← B

Video Tape No.: 3 Counter Data: 4113 to 4244 Cleaning Method: Jet Rod

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints
0+77 to 0+86								Dip 1/2"	

12
WEST Direction 9 ◯ 3 EAST Direction
6

Remarks:

Assessment:

Good 5 4 3 2 1 Poor

Evaluation: Good Condition

Repair: Replace:

Probable Causes of Observed Distress

Dip appears to be as constructed

Evaluation By: H. Price

Reviewed By: H. Price

FIGURE No. 11-1 Sheet 1 of 1

Project No. 34 4423 00 Date: 9-21-94 Field Engineer: JIM GRANT

Site Location: NORTON SHORES, MICHIGAN MDOT Designation:

Beginning Point: STA 8+00 SOUTHBOUND US-31 STRENBERG ROAD RAMP D

Ending Point:

Depth to Invert: Pipe Size: 18" Material: CMP Flow Direction: A←B

Video Tape No.: 3 Counter Data: 4244-4325 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12
EAST Direction 9 ◯ 3 WEST Direction
6

Remarks:

Assessment:

Good 5 (4) 3 2 1 Poor

Evaluation: GENERALLY GOOD CONDITION OUTLET AT B PARTIALLY OBSTRUCTED

Repair: CUT PROJECTING METAL AT B Replace:

Probable Causes of Observed Distress

AS CONSTRUCTED

Evaluation By: H. PRICE

Figure No. II-2 Sheet 1 of 1

Project No. 34 442300 Date: 9-21-94 Field Engineer:

Site Location: NORTON SHORES, MICHIGAN MDOT Designation:

Beginning Point: STA 30+25 US-31 STERNBERG ROAD RAMP C

Ending Point:

Depth to Invert: Pipe Size: 18" Material: CMP Flow Direction: A→B

Video Tape No.: 3 Counter Data: 4325- 4442 Cleaning Method: JET ROD

Observations:

Chainage	Roots	Cracks	Deformation	Obstruction	Debris	Infiltration	Line	Grade	Joints

12

EAST Direction 9 3 WEST Direction

6

Remarks:

Assessment:

Good (5) 4 3 2 1 Poor

Evaluation:

Repair: Replace:

Probable Causes of Observed Distress

Evaluation By: H. PRICE

Reviewed By: H. PRICE

APPENDIX B

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-22-94 Reference No.: 00070
Client: M-Dot
Job. No.: 522-1609 Area:
Job Location: M-44

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G. "B"- G.	V.H.S. Tape No.: 3
Pipe Size: 18" Pipe Condition: G.	Counter Location: 4769 – 5043
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 2658 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT: 4 1 / 3 2

Sta# 290+25 Sta# 293+00

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0600						A							
0620						C.P.L.							
1000				X		C.P.L.							
1429						D.P.							
1455						C.P.L.							
1493						D.P.							
2630						C.P.L.							
2658						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: _____

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-22-94 Reference No.: 00071
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-44

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G - "B"- G.	V.H.S. Tape No.: 3
Pipe Size: 24" Pipe Condition: G.	Counter Location: 5043 — 5144
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 419 (Circle One)

DIRECTION OF FLOW ← → (Circle One)

"B" MANHOLE NO. B

QUADRANT: 4 | 1 / 3 | 2

Sta# 302+60 Sta# 303+50

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0400						A							
0432						D.P.							
0460						D.P.							
0479						D.P.							
419						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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800•992•9118

Date: 9-22-94 Reference No.: 00073
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-44

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G , "B"- G	V.H.S. Tape No.: 54
Pipe Size: 12" Pipe Condition: G	Counter Location: 0658 – 1590
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← (Circle One) →

TOTAL DISTANCE: 2438 (Circle One)

DIRECTION OF FLOW ← (Circle One) →

"B" MANHOLE NO. B

QUADRANT: 4 | 1 / 3 | 2

Sta # 430+00

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0600						A
0612						C.P.L.
0617						C.P.L.
0624						C.P.L.
0628						C.P.L.
0636			H			C.P.L.
0654						C.P.L.
0660						C.P.L.
0670			H	H		C.P.L.
0677	H	H				C.P.L.
0698						C.P.L.
1007	H					C.P.L.
1010			H	H		C.P.L.
1031						C.P.L.
1062	H	H				C.P.L.

Sta # 432+40

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
1087	H	H				C.P.L.
2064						C.P.L.
2068			H	H		C.P.L.
2115						C.P.L.
2438						B

CODES:

J.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Artest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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Detroit, Michigan 48217
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Date: 9-22-94 Reference No.: 00072
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-44

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 4
Pipe Size: 18" Pipe Condition: G	Counter Location: 000 – 0658
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 2+45 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 492+50 Sta# 495+00

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
245						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Linear Cracks thru out Complete Line.

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Date: 9-21-94 Reference No.: 00052
Client: M-Dot
Job. No.: 572-1009 Area:
Job Location: US-131

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G	Counter Location: 2506 – 2714
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 469 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Statt 88+00 Statt 89+65

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
469						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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800•992•9118

Date: 9-21-94 Reference No.: 00053
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: US-131 BR

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G. "B"- G.	V.H.S. Tape No.: 3
Pipe Size: 15" Pipe Condition: G.	Counter Location: 2714 — 3011
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 490 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT: 4 | 1 / 3 | 2

Sta# 91484 Sta# 93485

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0400						A							
0438						C.P.L.							
0444						C.P.L.							
1409		b				C.P.L.							
1479						D.P.							
1481	b					C.P.L.							
1490						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: _____

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2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-26-94 Reference No.: 00048
Client: M-DOT
Job. No.: 522-1009 Area:
Job Location: I-94 at 9Th St.

LINE VIDEO INSPECTION REPORT

Inspector: ~~G~~	Job Foreman: Jim W.
Manhole Condition: "A"- ~~G~~ "B"- ~~G~~	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G.	Counter Location: 1270 – 1505
Type of Pipe: PVC.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← (Circle One) →

TOTAL DISTANCE: 2414 (Circle One)

DIRECTION OF FLOW ← (Circle One) →

"B" MANHOLE NO. B

QUADRANT: 4 | 1 / 3 | 2

Sta# 260+90 — Sta# 263+00

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0100						A
0104						45° – W.J.
0626						T.R.
0654						D.P.
1104						D.P.
1430						D.P.
1450						D.P.
1550						D.P.
1881						T.R.
1996						D.P.
2409						45° W.J.
2414						~~[illegible]~~ B

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.P.C.: Service Connection

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: unable to mandrell due to 45° at Each End.

APPROVED BY: _____

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Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-20-94 Reference No.: 00049
Client: M-DOT
Job. No.: 522-1009 Area:
Job Location: I-94

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G	Counter Location: 1575 – 1802
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. 6

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 1655 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 343+90 Sta# 345+00

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
017						D.P							
651						D.P.							
656						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.B.C.: Service Connection
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: mandrell - OK

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Date: 9-20-94 Reference No.: 00050
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: I-94

LINE VIDEO INSPECTION REPORT

Inspector:	Job Foreman: Jim W.
Manhole Condition: "A"-	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition:	Counter Location: 1802 — 2278
Type of Pipe: PVC	Client Requests Copy: ☑ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A — DIRECTION OF MEASUREMENT ← → (Circle One) — "B" MANHOLE NO. B

TOTAL DISTANCE: 2+82 (Circle One)

DIRECTION OF FLOW ← →

QUADRANT: 4 | 1 / 3 | 2

Sta# 35440 — Sta# 35370

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A
0+14						D.P.
0+25						D.P.
0+39						D.P.
0+56						D.P.
0+67						D.P.
0+85						D.P.
1+30						O.J.
1+31						O.J.
1+39						D.P.
1+63						D.P.
1+85						D.P.
2+05						D.P.
2+24						D.P.
2+42						D.P.
2+64						D.P.

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
2+64						D.P.
2+82						B.

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Manhole — from B 1+5 from A 1+28'

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Date: 9-20-94 Reference No.: 00057
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: 1-94

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G	Counter Location: 2278 - 2510
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 1497 (Circle One)

DIRECTION OF FLOW ← → (Circle One)

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 393+00

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A
0+12						D.P.
0+24						D.P.
0+72						D.P.
1497						B

Sta# 391+00

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
[illegible] Connection
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Mandrell - from B 3'
from A 36'

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Date: 9-19-94 Reference No.: 00046
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-31
US

LINE VIDEO INSPECTION REPORT

Inspector:	Job Foreman: Jim W.
Manhole Condition: "A"-	"B"- V.H.S. Tape No.: 3
Pipe Size: 15" Pipe Condition: G	Counter Location: 0805 – 1071
Type of Pipe: PVC	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0194 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

UTA# 748400 N.B.

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0100						A							
0122						D.P.							
0152						D.P.							
0194						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Heavy water at End of Line.
Mandrell – from B 79'
From A 11'

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Date: 9-19-94 Reference No.: 00045
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: ~~M~~-31 US

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 24" Pipe Condition: G	Counter Location: 0612 - 0805
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← (Circle One) →

TOTAL DISTANCE: 1615

DIRECTION OF FLOW ← (Circle One) →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 75340 N.B.

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0000						A							
1615						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Heavy Water at Both Ends of pipe

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Date: 9-19-94 Reference No.: 00044
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: ~~M~~-31 US

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 24" Pipe Condition: G.	Counter Location: 0360 - 0612
Type of Pipe: Conc.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0+91 (Circle One)

DIRECTION OF FLOW ← → (Circle One)

"B" MANHOLE NO. B

QUADRANT: 4 | 1 | 3 | 2

Sta#753+10 S.B.

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
0+68	↓					C.P.L.							
0+77	↓		66			C.P.L.							
0+91						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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Date: 9-19-94 Reference No.: 00043
Client: M-Dot
Job. No.: 522 Area:
Job Location: ~~M~~-31 US

LINE VIDEO INSPECTION REPORT

Inspector: G
Manhole Condition: "A"- G "B"- G
Pipe Size: 24" Pipe Condition: G
Type of Pipe: Conc.
Type of Joint: O-Ring
Remarks:

Job Foreman: Jim W.
V.H.S. Tape No.: 3
Counter Location: 000 — 6360
Client Requests Copy: ☒ Yes ☐ No
Remarks:

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)
TOTAL DISTANCE: 2+46
DIRECTION OF FLOW ← → (Circle One)

"B" MANHOLE NO. B

QUADRANT: 4 | 1 / 3 | 2

Sta# 767+00 South Side

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A
1+20						D.P.
1+40						D.P.
2+01						C.P.L.
2+46						B.

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.J.: Aligned Joint
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
[illegible]: Radial Crack

NOTES:

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Date: 9-19-96 Reference No.: 00047
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: ~~M~~ US-31

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 15" Pipe Condition: G	Counter Location: 1105 - 1270
Type of Pipe: PVC.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint: Glue	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0+88 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT: 4 | 1 / 3 | 2

Sta# 772+50 N.B.

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
0+17						D.P.							
0+88						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES: Mandrell - from B
from A 7'

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800•992•9118

Date: 9-22-94 Reference No.: 00069
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: Old M-21

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 18" Pipe Condition: G	Counter Location: 4631 – 4769
Type of Pipe: Gal.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 1+19 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT: 4 | 1 / 3 | 2

Sta# 531+50 Sta# 532+75

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
0+23						D.P.							
0+46						D.P.							
0+79						D.P.							
1+19						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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Date: 9-22-94 Reference No.: 00068
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: Old M-21

LINE VIDEO INSPECTION REPORT

Inspector:	Job Foreman: Jim W.
Manhole Condition: "A"-	"B"- V.H.S. Tape No.: 3
Pipe Size: 18" Pipe Condition: G.	Counter Location: 4412 – 4631
Type of Pipe: Ga.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 442

DIRECTION OF FLOW ← → (Circle One)

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta # 544430 Sta # 545465

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0000						A							
0182						D.P.							
0412				↓		Dept							
1422						D.P.							
442						B.							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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Date: 9-23-94 Reference No.: 000732
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: I-96

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim (J)
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: X
Pipe Size: 12" Pipe Condition: G	Counter Location: 000 — 0299
Type of Pipe: ~~[illegible]~~, ~~[illegible]~~ Conc.	Client Requests Copy: ☑ Yes ☐ No
Type of Joint: ~~[illegible]~~ O-Ring	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0462 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta # 373+00

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
026	X					C.P.							
045						D.P.							
062						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Reach Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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Date: 9-21-94 Reference No.: 00059
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: I-196

LINE VIDEO INSPECTION REPORT

Inspector: Ø	Job Foreman: Jim W.
Manhole Condition: "A"- Ø "B"- Ø	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G	Counter Location: 3287 – 3459
Type of Pipe: Gal.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks: A – B #1
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0454 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 1437460 NB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0000						A							
0454						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack

NOTES:

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800•992•9118

Date: 9-21-94 Reference No.: 00060
Client: M-DOT
Job. No.: 522-1009 Area:
Job Location: I-196

LINE VIDEO INSPECTION REPORT

Inspector:	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G.	Counter Location: 3457 – 3601
Type of Pipe: Gal.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks: A-B #2
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0454 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

SG #1437460 NB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0400						A							
0454						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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Date: 9-21-94 Reference No.: 00061
Client: M-DOT
Job. No.: 522-1009 Area:
Job Location: I-196

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G	Counter Location: 3601 — 3711
Type of Pipe: Gal.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks: A - B #3
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0454 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT: 4 | 1 / 3 | 2

Sta# 1437+68 NB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0400						A							
0454						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

APPROVED BY: _____

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800•992•9118

Date: 9-21-94 Reference No.: 80062
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: I-196

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G.	Counter Location: 3711 - 3852
Type of Pipe: Galv.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks: A-B #4
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← (Circle One) →

TOTAL DISTANCE: 0068 (Circle One)

DIRECTION OF FLOW ← (Circle One) →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Stg #143710 SB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0000						A							
0068						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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SECTION 9-4

Inland Waters Pollution Control, Inc.
2021 South Schaefer Highway
Detroit, Michigan 48217
313•841•3922
800•992•9118

Date: 9-21-94 Reference No.: 00063
Client: M-DOT
Job. No.: 522-1009 Area:
Job Location: I-196

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G	Counter Location: 3852 — 3992
Type of Pipe: Gal	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks: A-B #5
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0469 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

ST#1437410 NB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0402						A							
0409						OJ.							
0429						OJ							
0449						OJ							
0469						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Artest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

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Date: 9-21-94 Reference No.: 00064
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: I-196

LINE VIDEO INSPECTION REPORT

Inspector: Θ	Job Foreman: Jim W.
Manhole Condition: "A"- Θ "B"- Θ	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G	Counter Location: 3992 – 4113
Type of Pipe: Gal.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks: A-B #6
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← →

TOTAL DISTANCE: 0+69 (Circle One) (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta#1437+10 NB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0+00						A							
0+10						O.J							
0+29						O.J							
0+69						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
[illegible] Service Connection
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

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Date: 9-21-94 Reference No.: 00058
Client: M-DOT
Job. No.: 522-1009 Area:
Job Location: M-43

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jinks
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G	Counter Location: 3286 – 3357
Type of Pipe: Col	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0435 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Stg# 91+49

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0000						A							
0420						D.P.							
0435						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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Date: 9-21-94 Reference No.: 00057
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-43

LINE VIDEO INSPECTION REPORT

Inspector:	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G	Counter Location: 3211 — 3296
Type of Pipe: Gal.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0635 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta # 92443

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0000						A							
0635						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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Date: 9-21-94 Reference No.: 00056
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-43

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G	Counter Location: 3142 - 3211
Type of Pipe: Gal	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0636 (Circle One)

DIRECTION OF FLOW ← → (Circle One)

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 93475

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0600						A							
0636						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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Date: 9-21-94 Reference No.: 00055
Client: M-DOT
Job. No.: 522-1009 Area:
Job Location: M-43

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G	Counter Location: 3079 – 3142
Type of Pipe: Gal.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0435 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta#95-20

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0400						A							
0435						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good E: Fair P: Poor
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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Date: 9-21-94 Reference No.: 00054
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: M-43

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 12" Pipe Condition: G	Counter Location: 3011 — 3079
Type of Pipe: Gal.	Client Requests Copy: ☐ Yes ☐ No
Type of Joint:	Remarks:
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0426 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 112+35

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0400						A							
0426						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

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Date: 9-21-94 Reference No.: 00065
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: US-31

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 18" Pipe Condition:	Counter Location: 4413 – 4244
Type of Pipe: Gal.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks: Ramp A
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 0698 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta# 7+90 N.B.

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
0600						A							
0682						D.P.							
0698						B							

CODES:

C.: Service Connection
P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

NOTES:

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800•992•9118

Date: 9-21-94 Reference No.: 00066
Client: MoDot
Job. No.: 522-1009 Area:
Job Location: US-31

LINE VIDEO INSPECTION REPORT

Inspector: G	Job Foreman: Jim W.
Manhole Condition: "A"- G "B"- G	V.H.S. Tape No.: 3
Pipe Size: 18" Pipe Condition: G.	Counter Location: 4244 – 4325
Type of Pipe: Gal.	Client Requests Copy: ☒ Yes ☐ No
Type of Joint:	Remarks: Ramp D
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 062 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT

4	1
3	2

Sta # 8+00 SB

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
000						A							
062						B							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor
N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

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Date: 9-21-94 Reference No.: 00067
Client: M-Dot
Job. No.: 522-1009 Area:
Job Location: US-31

LINE VIDEO INSPECTION REPORT

Inspector:	Job Foreman: Jim W.
Manhole Condition: "A"-	"B"-	V.H.S. Tape No.: 3
Pipe Size: 18" Pipe Condition: G	Counter Location: 4325 – 4442
Type of Pipe: Gal.	Client Requests Copy: ☐ Yes ☐ No
Type of Joint:	Remarks: Ramp C
Remarks:	

"A" MANHOLE NO. A

DIRECTION OF MEASUREMENT ← → (Circle One)

TOTAL DISTANCE: 452 (Circle One)

DIRECTION OF FLOW ← →

"B" MANHOLE NO. B

QUADRANT: 4 | 1 / 3 | 2

Sta #30+25

DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS	DISTANCE READING	QUADRANT 1	2	3	4	S C	CODE/REMARKS
400						A.							
452						B.							

CODES:

S.C.: Service Connection
B.P.: Broken Pipe
R.I.: Root Intrusion
H.M.: Horiz. Misalignment
V.M.: Vertical Misalignment
A.T.: Airtest Joint
D.P.: Dip in Pipe
S.C.R.C.: Service Connection Rough Cut
G: Good F: Fair P: Poor

N.V.L.: No Visible Leaks
P.L.: Pipe Leak
J.L.: Joint Leak
W.J.: Open Joint
O.J.: Offset Joint
C.P.L.: Linear Crack
C.P.R.: Radial Crack

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