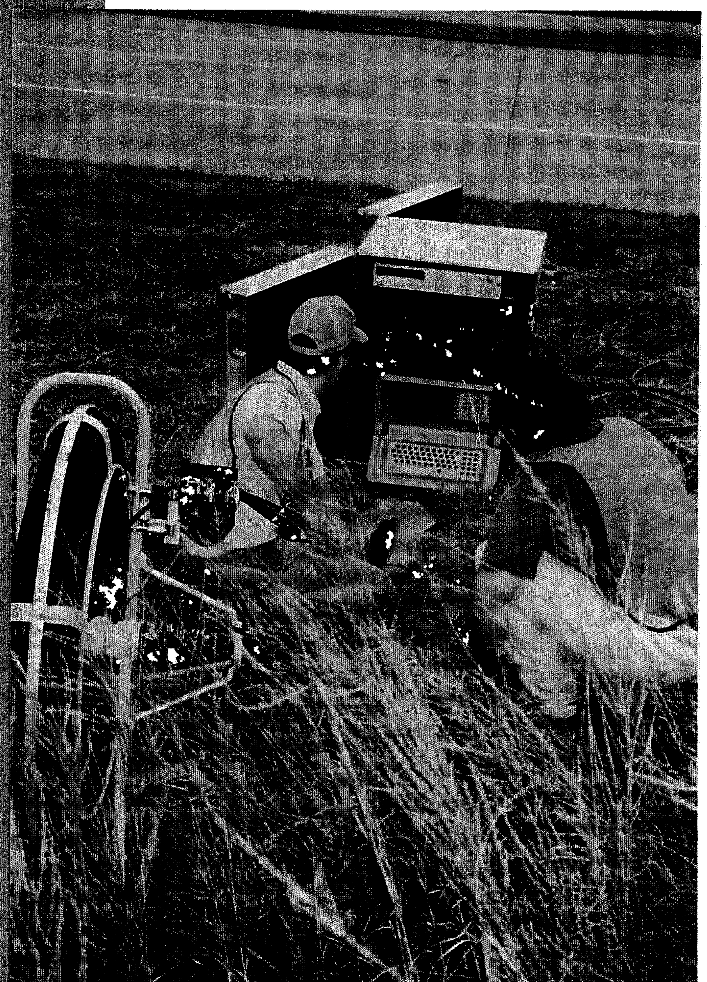
U.S. Department of Transportation
Federal Highway Administration

Video Inspection of Highway Edgedrain Systems

April 1998



FHWA-SA-98-044

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
FHWA-SA-98-044		

4. Title and Subtitle	5. Report Date
Video Inspection of Highway Edgedrain Systems	April 1998
	6. Performing Organization Code
7. Author(s) J.F. Daleiden	8. Performing Organization Report No.
9. Performing Organization Name and Address Brent Rauhut Engineering Inc. 8240 Mopac, Suite 220 Austin, Texas 78759	10. Work Unit No. (TRAIS) 11. Contract or Grant No. DTFH61-95-C-00005
12. Sponsoring Agency Name and Address Federal Highway Administration Office Of Highway Infrastructure 6300 Georgetown Pike McLean, Virginia 22101-2296	13. Type of Report and Period Covered 14. Sponsoring Agency Code

15. Supplementary Notes

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16. Abstract

Minimizing infiltration of water in pavement structures has long been a priority of pavement designers. Incorporation of subsurface edgedrains is frequently an integral part of an pavement drainage system. In order for such a system to be effective however, it must be properly installed and maintained. With advances in video technology, inspection of edgedrain systems can now be conducted quite efficiently.

This report documents the results of 287 video inspections of highway edgedrain systems in 29 states. These inspections were conducted to both demonstrate the capabilities of the technology as well as demonstrating some of the common problems associated with the performance of edgedrain systems. Findings indicated not only that the equipment was quite effective in identifying edgedrain performance concerns, but also how widespread the concerns of edgedrain performance are. Almost one third of the systems inspected had non-functional outlets, another third were either found to have non-functional mainlines or the mainlines could not be inspected due to physical obstructions. Only one third of the systems inspected were found to be performing as intended.

Recommendations are provided for edgedrain design improvements to facilitate performance of the system and their inspections as well as recommendations to improve quality control during construction. Suggestions are also provided for maintenance procedures to address concerns identified in the inspection process. A Draft Guide Specification For Video Edgedrain Inspection and Acceptance is also provided as an Appendix.

17. Key Words	18. Distribution Statement
Pavement Subsurface Drainage, Edgedrain, Video Inspection	No restrictions. This document is available to the public from the National Technical Information Service, Springfield, VA, 22161.

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	43	

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1.0 INTRODUCTION

Minimizing the infiltration of water in pavement structures has long been a high priority of highway and municipal engineers. Numerous studies have been conducted on this subject, many of which are referenced or discussed in the FHWA's Demo. No. 87 Participant Notebook (Reference 1). Ongoing studies like the Long-Term Pavement Performance Program (LTPP), have various specific pavement study test sections (SPS) constructed to include permeable bases which are designed to help transfer water away from the pavement structure to an edgedrain system constructed within the shoulder medium. These SPS projects include both new construction and rehabilitation projects.

The incorporation of subsurface edgedrains is frequently an integral piece of an effective pavement drainage system. Performance of the edgedrains can effectively dominate the performance of a drainage system. With this in mind, construction and maintenance of edgedrains is an area of considerable interest. Edgedrains stop performing their primary function of diverting water from the pavement for various reasons. Pipe settlement and/or sags, silt build-up, crushed pipes, rodents' nests or other similar obstructions can cause these systems to malfunction.

Fortunately, new video technology has allowed highway agencies to conduct inspections and establish if their edgedrains are functioning properly. Edgedrain inspection equipment has effectively been utilized to identify the types of problems that exist in an edgedrain system and their locations within the system. From these inspections, appropriate maintenance can be planned. This new technology has also been effectively utilized as a QA tool on rehabilitation and/or new construction of edgedrain systems.

Maintaining the edgedrain system is essential for continued successful performance of permeable bases. Inspecting edgedrain systems with a video camera provides a clear observation of their condition and/or ability to perform as intended. This project has introduced highway agencies to this new technology as part of the process in providing an effective pavement drainage system.

The intent of this project was to provide State Highway Agencies clear video images of the interior of highway edgedrain systems as a tool for inspecting and maintaining existing highway edgedrain systems, and demonstrate their capabilities for use in this capacity.

2.0 DEMONSTRATIONS

A high resolution, high sensitivity, color video camera, capable of negotiating a 100mm x 100mm 90° tees, is attached to a pushrod cable (approximately 15mm diameter, 150m long). A detailed listing of the equipment used is provided in Table 1. The camera design includes a ball-shaped lighthead that is introduced at outlet pipes; and the lighthead has spring-actuated segments in the camera assembly to help it negotiate 90° tees. A camera guide has also been fabricated to help negotiate the tees, when necessary (Figure 5). A 200mm video monitor allows the operator to view the edgedrain system during the inspection process. As the camera is pushed along (Figure 6), the VCR records the inspection in progress, combining digital distance output, as well as a clear color image of the edgedrain's interior.

When the camera approaches an obstruction in the edgedrain system, it is identified on the screen of the camera control unit. The operator can also encode the exact location along the edgedrain where the obstacle or obstruction section lies. The operator types information, such as the highway location, milepost, state and other pertinent information on the the keyboard of the camera control unit, which is in turn displayed on the screen. Similarly, audio dubbing capabilities are available to help document observations made. A 35mm video printer also generates a clear color print of the edgedrain interior or problems of interest.

Upon completion of the inspection, the performance of the edgedrain system is well documented on video tape. State Highway Agencies were supplied with copies of a narrated videotape and a set of video prints showing representative conditions in the edgedrain system. The video inspection provided the State Highway Agency with a clear picture of edgedrain condition in their state, and gave them additional insight for developing different means for maintaining or constructing their edgedrains in the future.

Table 1. Equipment Description

Camera - The camera is a Pearpoint flexiprobe high resolution, high sensitivity, waterproof color video camera engineered to inspect pipes 75mm to 150mm in diameter. The flexiprobe lighthead and camera has a physical size of 70mm and is capable of negotiating 100mm x 100mm plastic tees. The lighthead incorporates six high-intensity lights. This lighting provides the capability for a clear "true" color picture of the entire surface periphery of a pipe. The camera includes a detachable hard plastic ball which centers the camera during pipe inspections (Figure 1).
Camera Control Unit - The portable color control unit includes a built-in 200mm color monitor and controls including remote iris, focus, video input/output, audio in with built-in speaker, and light level intensity control. Two VCR input/output jacks are provided for video recording as well as tape playback verification through the built-in monitor (Figure 2).
Metal Coiler and Push Rod With Counter - The portable coiler contains 150 meters of integrated semi-rigid push rod, gold and rhodium slip rings, electro-mechanical cable counter and electrical cable. The integrated push rod/electrical cable consists of a special epoxy glass reinforced rod with polypropylene sheathing material which will allow for lengthy inspections due to the semi-rigid nature of this system (Figure 3).
Video Cassette Recorder - The video cassette recorder is a high quality four head industrial grade VHS type recorder with audio dubbing, still frame, and slow speed capabilities.
Generator - A compact portable Honda EX650 generator is capable of 115 volts and 650 watts to power the inspection equipment.
Molded Transportation Case - A molded transportation case specifically built for air transportation encases the control unit, camera and video cassette recorder.
Panasonic AG-EP60 Color Video Printer - A video printer is incorporated into the system which allows the technician to obtain color prints of pipe anomalies or areas of interest. This system obtains direct electronic input from the monitor control unit providing a high quality print (Figure 4).

This system allowed the State Highway Agencies to determine pinpoint locations of defects within the system were portions could subsequently be excavated and repaired. The video camera system also allows highway agencies to efficiently and economically inspect edgedrains for quality control purposes immediately after construction.

Under this project, 22 demonstrations have been conducted which included 29 States (Figure 7). A listing of those demonstrations and the associated states and dates where demonstrations were conducted is provided in Table 2.

Table 2. State Demonstrations

August 7-11, 1995	North Carolina
August 21-24, 1995	Pennsylvania, New Jersey
September 25-29, 1995	West Virginia
October 9-12, 1995	Kentucky, Tennessee
October 23-26, 1995	Mississippi, Alabama
November 6-10, 1995	Arkansas
November 13-17, 1995	Louisiana
November 27-30, 1995	South Carolina
February 26-28, 1996	Florida
April 8-12, 1996	Illinois, Indiana, Ohio, Michigan
April 29-May 3, 1996	Connecticut
May 1-2, 1996	New York
May 13-17, 1996	New Mexico
May 20-24, 1996	Arizona
June 17-21, 1996	Wyoming
June 24-28, 1996	Montana
July 8-12, 1996	Oklahoma
July 23-25, 1996	Maryland, Delaware
September 16-18, 1996	Nevada
October 28-30, 1996	Missouri
April 15-17, 1997	Virginia
August 12-12, 1997	Hawaii

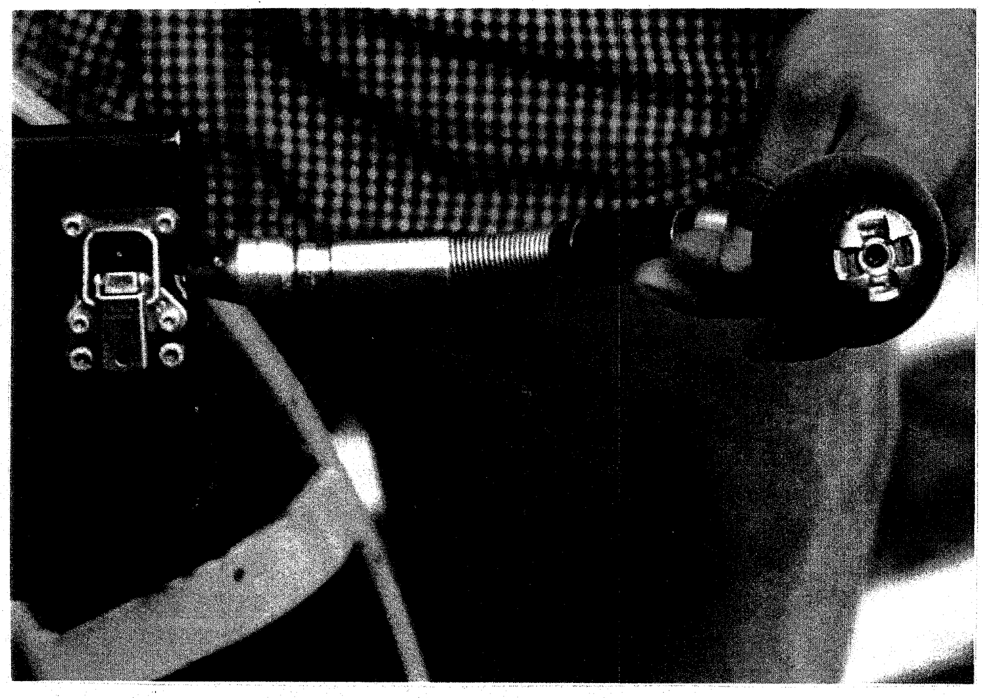


Figure 1. Pearpoint Camera.

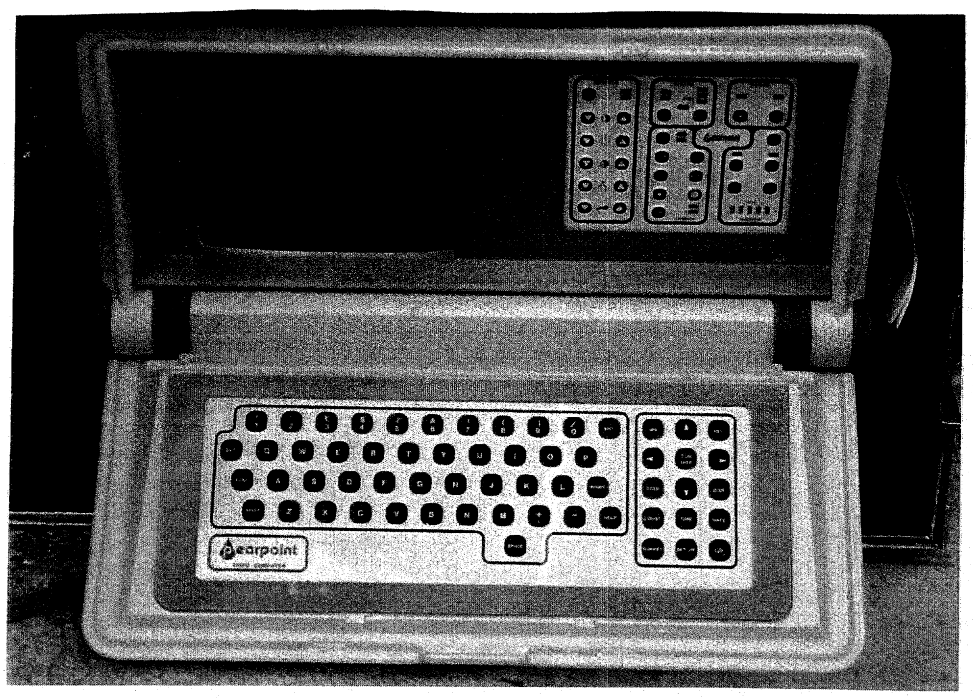


Figure 2. Camera Control Unit.

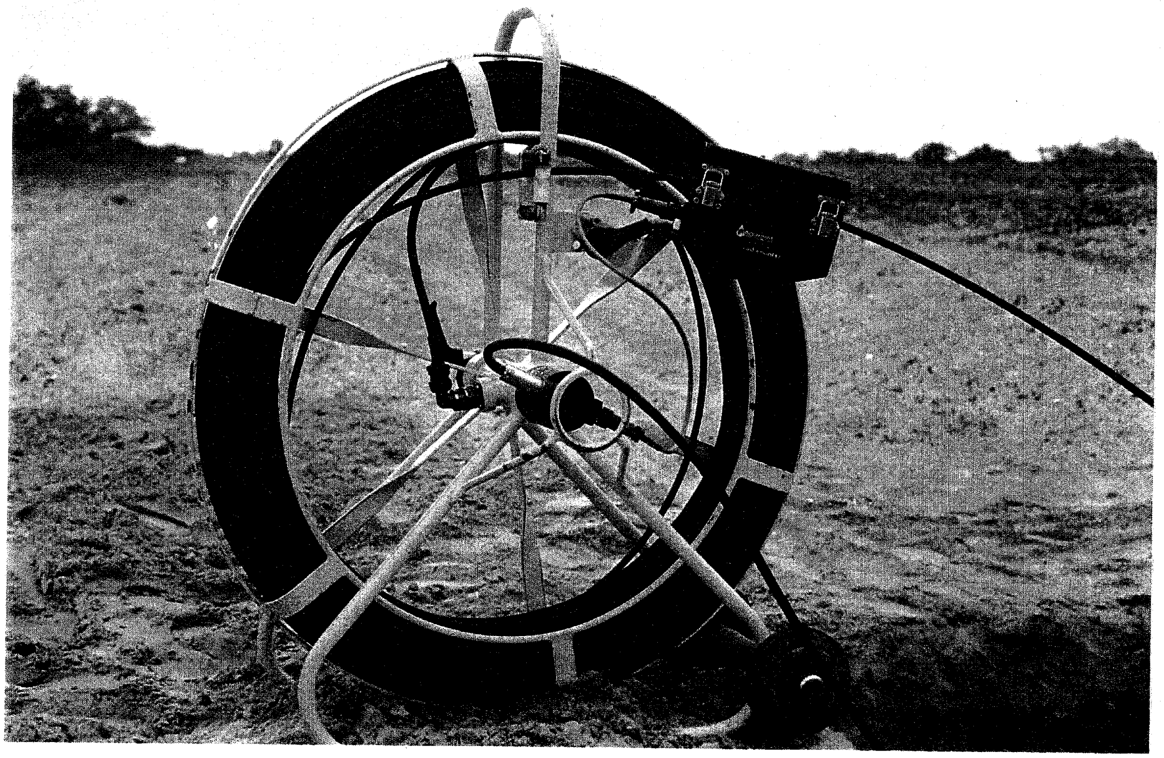


Figure 3. Metal Coiler and Push Rod.

Figure 4. Panasonic AG-EP60 Color Printer.

Figure 5. Camera Guide.

Figure 6. Inspection in Progress.

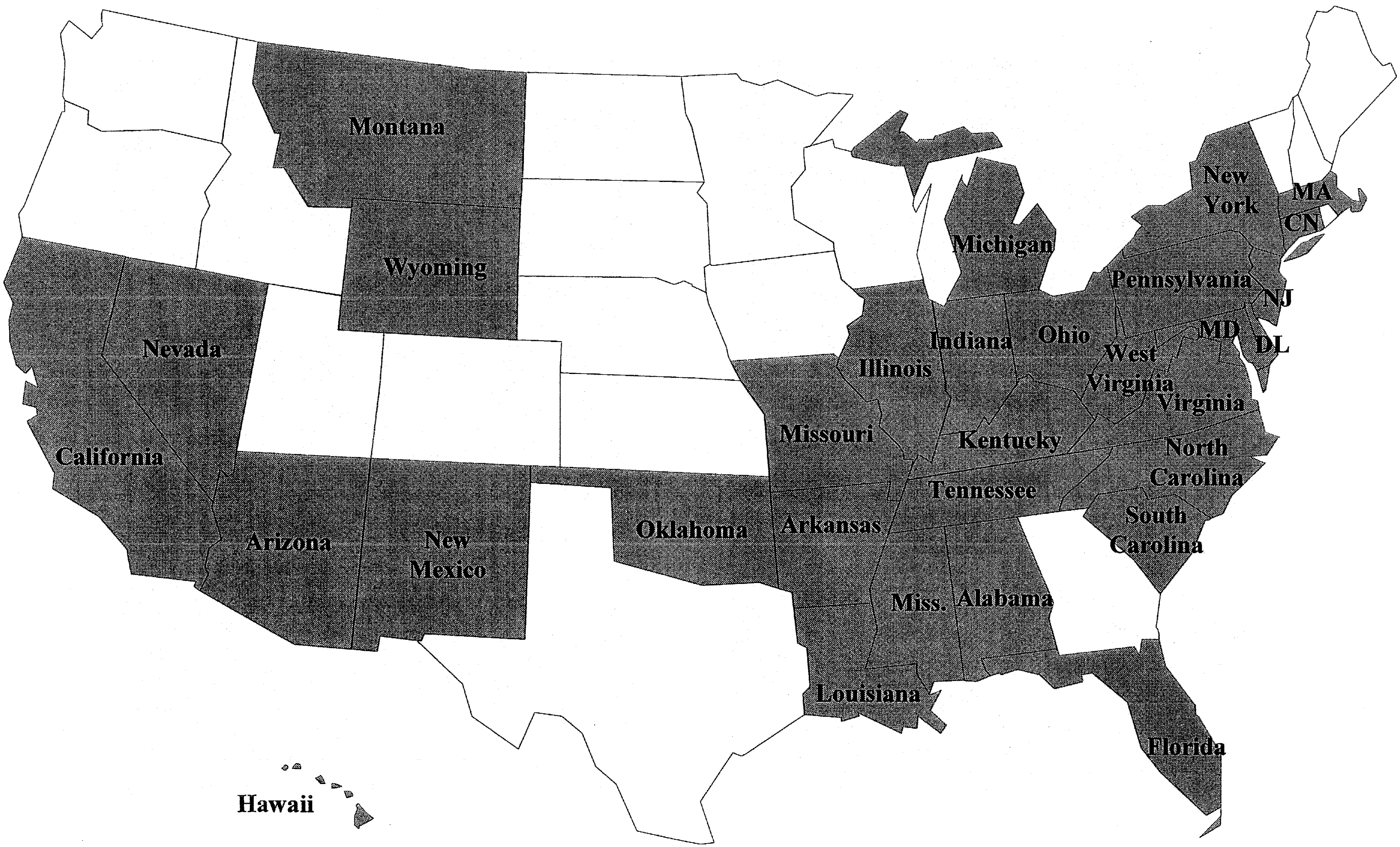


Figure 7. Completed edge drain inspections.

3.0 SUMMARY OF FINDINGS

Video inspection/demonstrations have been performed in over 29 states during the past 24 months through August 1997 on behalf of Demo No. 87. The inspections have been conducted on 287 lateral/mainline segments which range in age from over 30 years to systems currently being constructed.

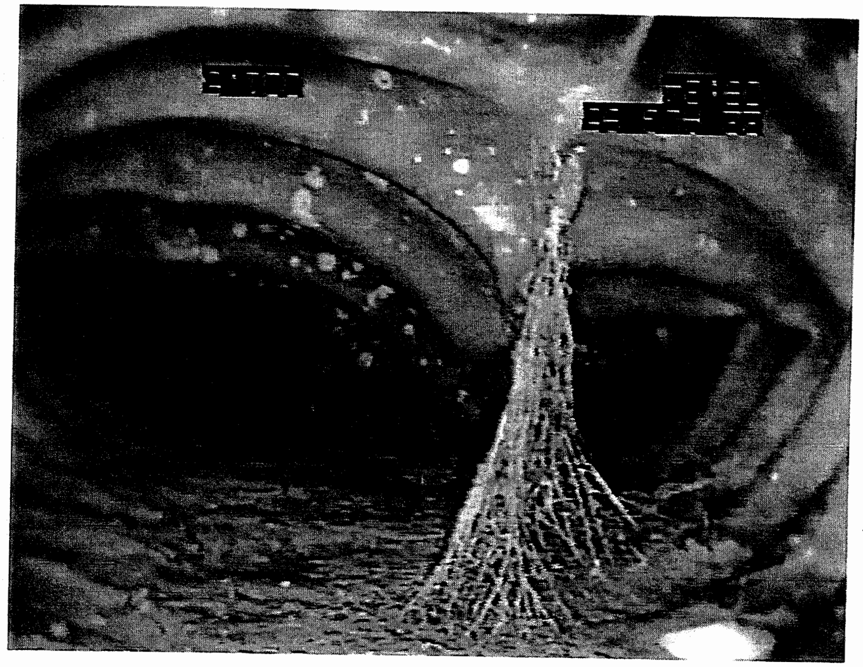
3.1 Edgedrain Observations

Of the 287 lateral/mainline edgedrain systems attempted, over 100 demonstrations were terminated due to defects with the laterals. Fifty-two (18%) had crushing in the lateral. Another 50 (17%) of the lateral systems were silted-in, limiting the investigations on these systems (Figure 8 and 9). In addition, 36 (13%) were composed of geocomposite sock, panel drain, drop tees, drop inlets, or no mainline systems at all (Figure 10).

149 (52%) mainline segments were capable of inspection. Figure 11 shows a clear 90° tee junction of the lateral and mainline. Of these 149, 17% (26) were found to be crushed, silted in, or obstructed within the first 30 meters. Sixteen percent (24) of the inspections covered 30-60-meters of the mainline segment, 28% (41) went to the 60-90-meter range (Figure 12), 18% (27) were in the 90-120-meter range and 21% (31) covered 120-150-meters of the mainline (Figure 13). In many instances, a crush in the mainline system could be identified or associated with a known construction crossing prior to the opening of traffic on to a given highway.

Some of the more common crushed pipe occurrences were found in edgedrain systems under construction. This lends evidence to the theory that many edgedrain failures may occur before the Contractor has left the project. Use of inferior construction materials (Figure 14) or questionable construction practices (Figures 15-17) can render the edgedrains ineffective before they are even paid for.

Similarly, if the pipe is not placed to an uniform grade, sags will develop which can lead to other concerns. These sags will collect water which fosters weed growth (Figure 18) and a habitat for all sorts of creatures, such as turtles, snakes, crawfish and frogs (Figure 19). If rodent screens are not



↑ UP

Figure 8. Silted and Crushed Lateral, Just Inside the Lateral Outlet (1.5 Feet).

(Note: The Image is Upside Down)

HEAVILY SILTED AREA AT LATERAL/MAINLINE JCT.

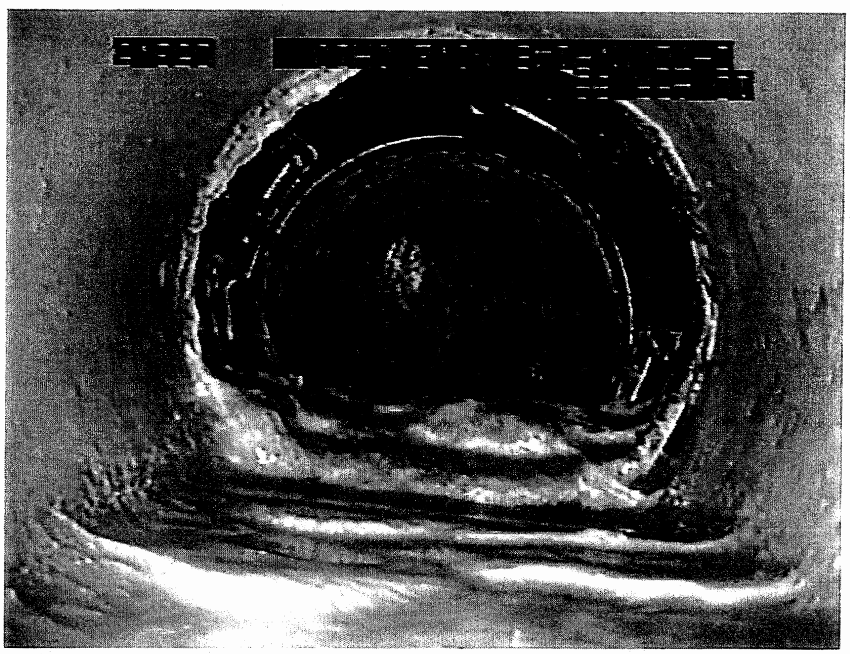


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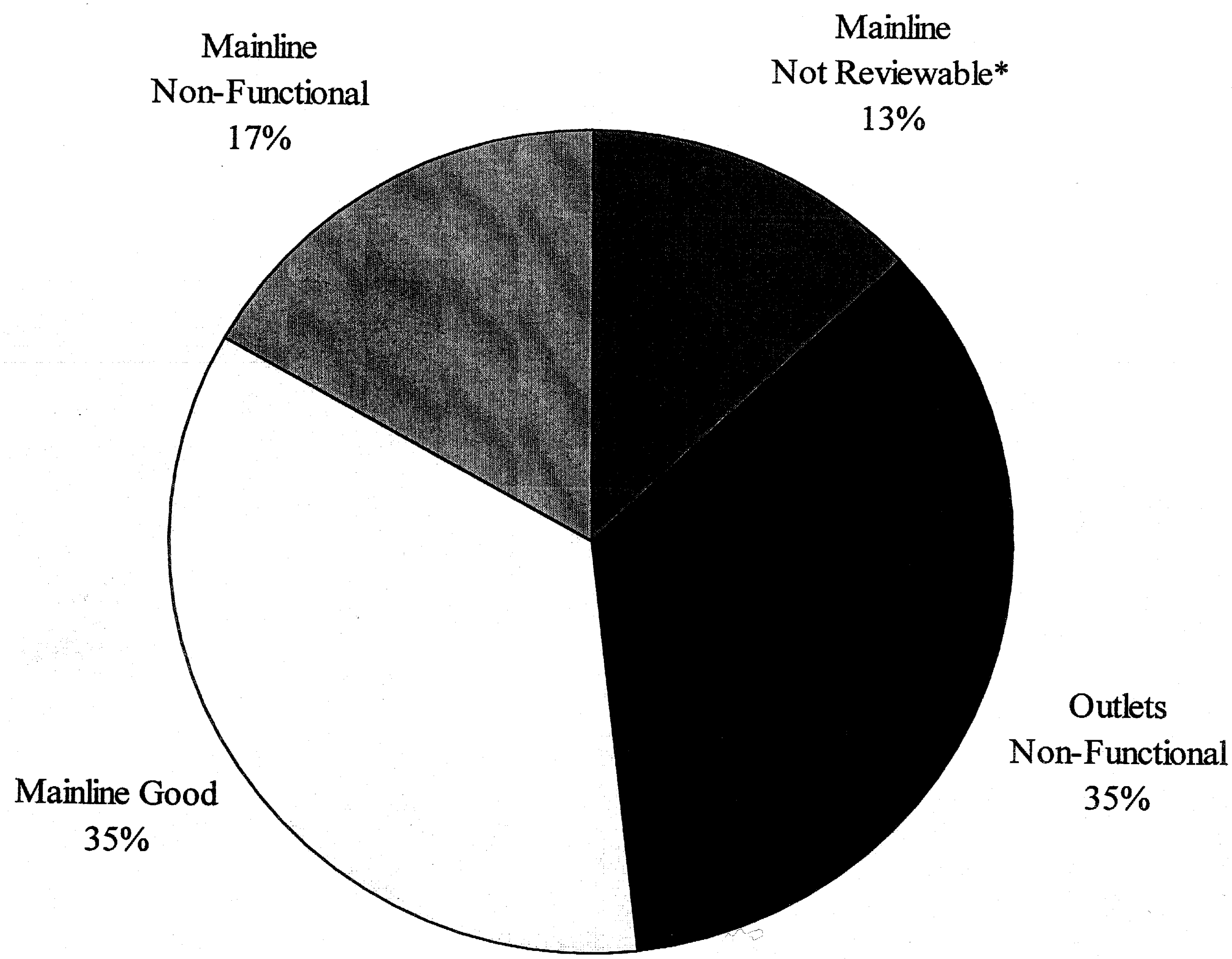
Figure 9. Heavy Silt Flow at Lateral/Mainline Junction.



* Could not inspect geocomposite socks, panel drains, drop tees, drop inlets or systems where no mainline was installed.

Figure 10. Breakdown of Video Inspections.

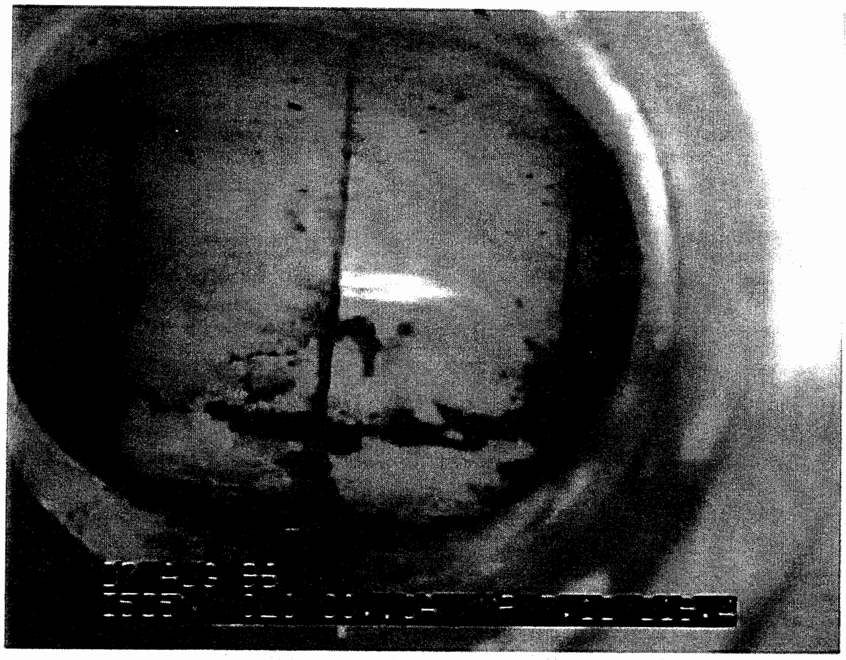


Figure 11. Clear 90° Tee Junction of Lateral and Mainline

Figure 12. Crushed Mainline Segment at 238.3 Feet.

(Note: Top of Pipe is Upper Right)

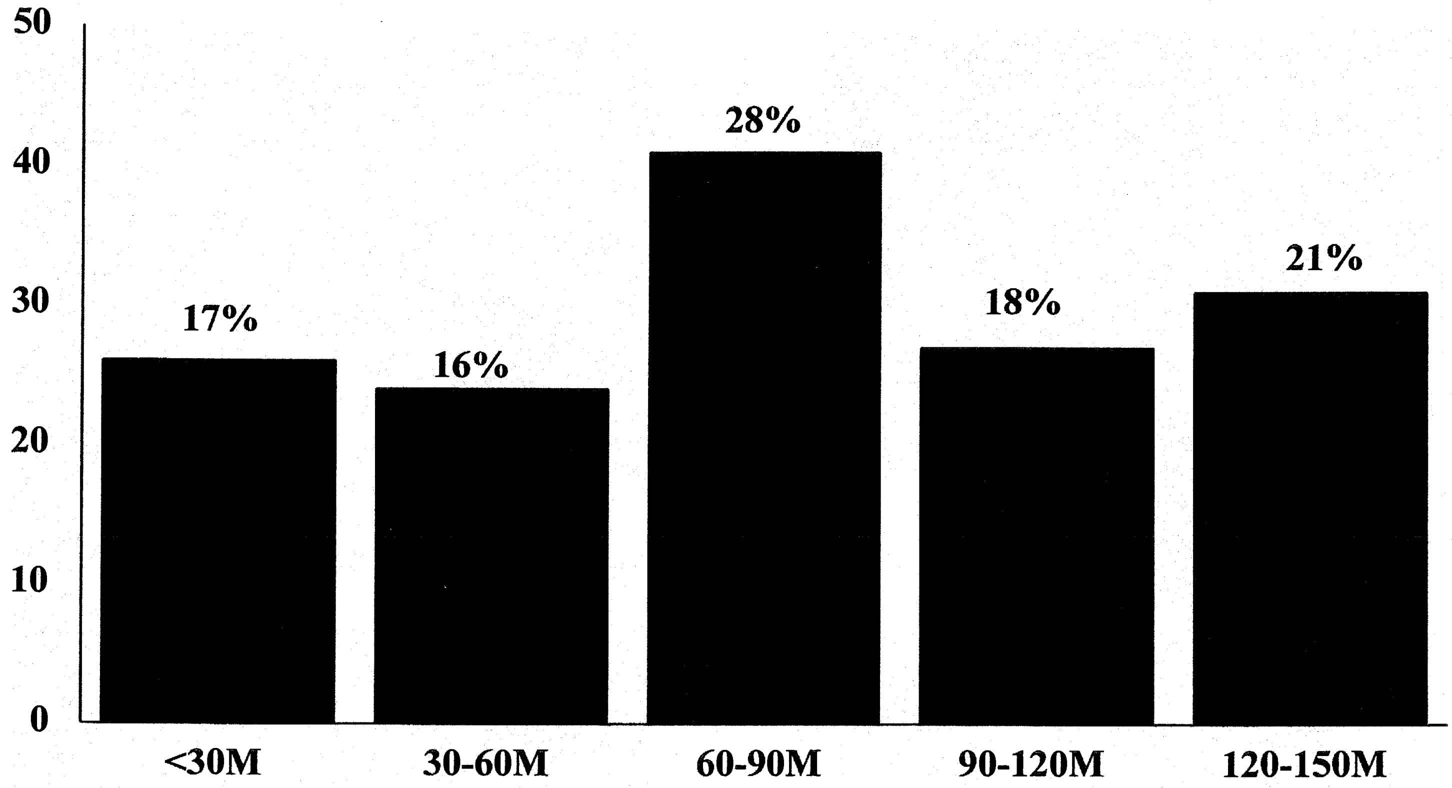


Figure 13. Mainline Demonstrations Resulting in the Following Attained Distances.

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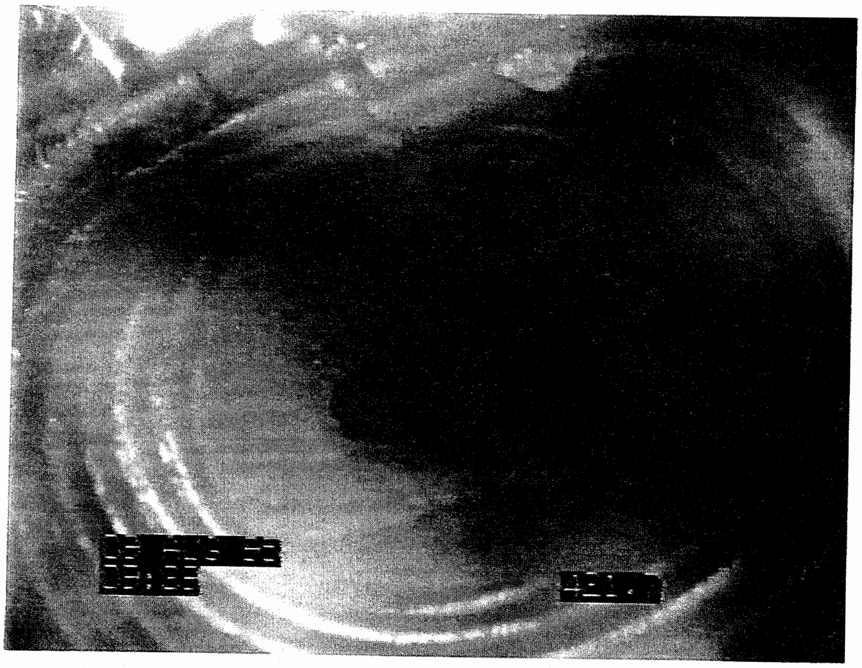


Figure 14. Inferior Construction Materials (A Brick End Cap)

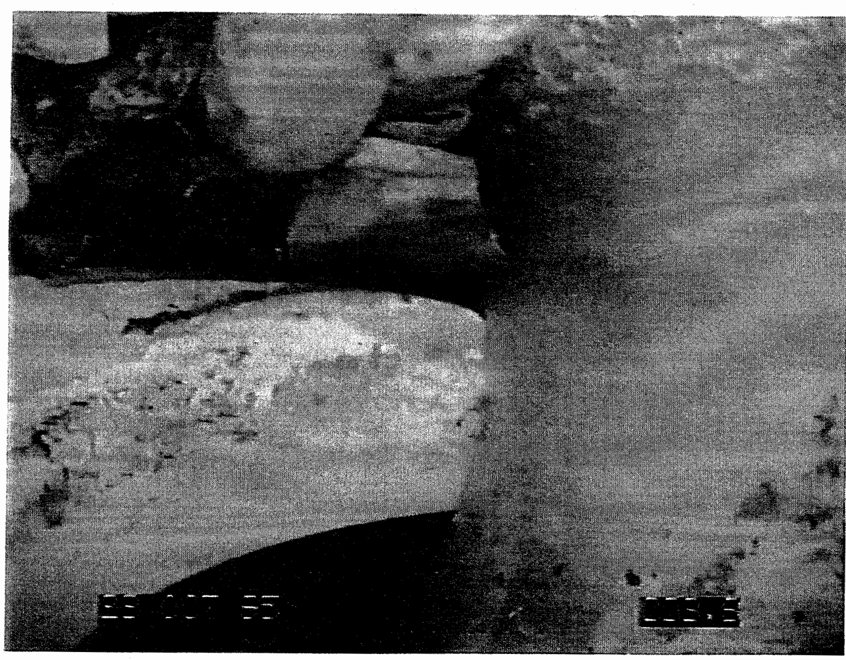
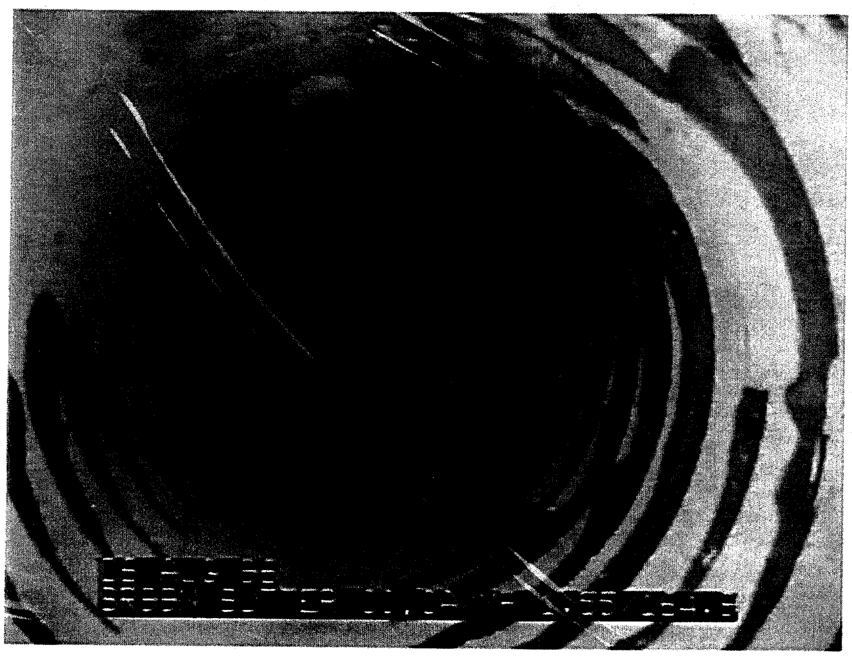


Figure 15. Materials/Obstructions Introduced During Construction. Note: PVC

Figure 16. Asphalt-Stabilized Base in Edgedrain.



ASPHALT INFLUX

Figure 17. Asphalt Base Permeating Slots in Drain.

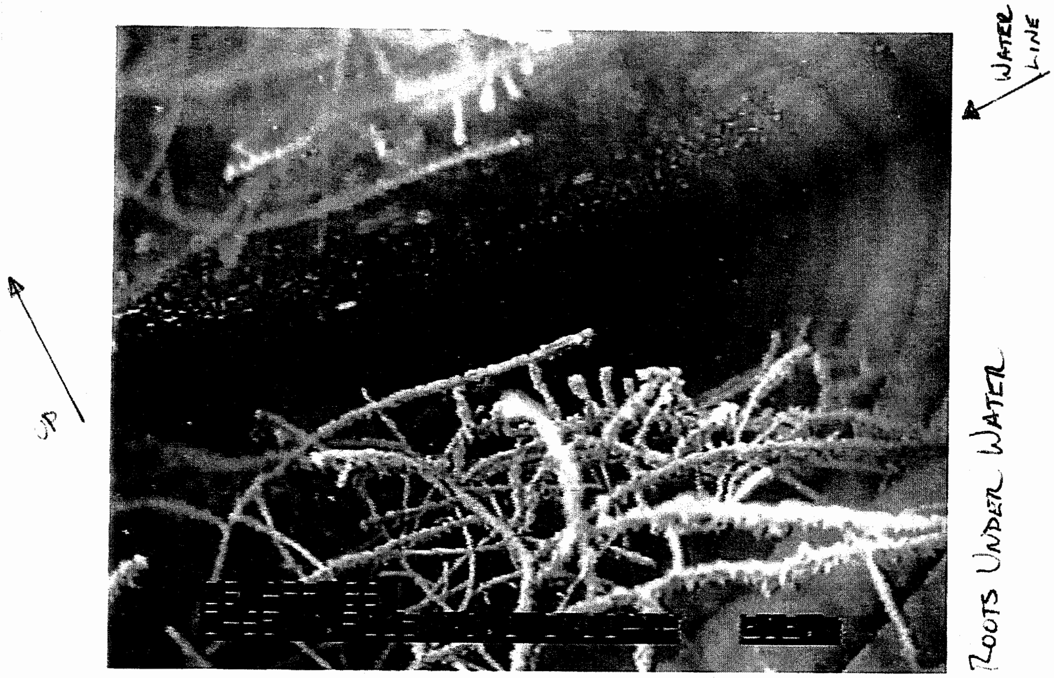


Figure 18. Root Growth Underwater.

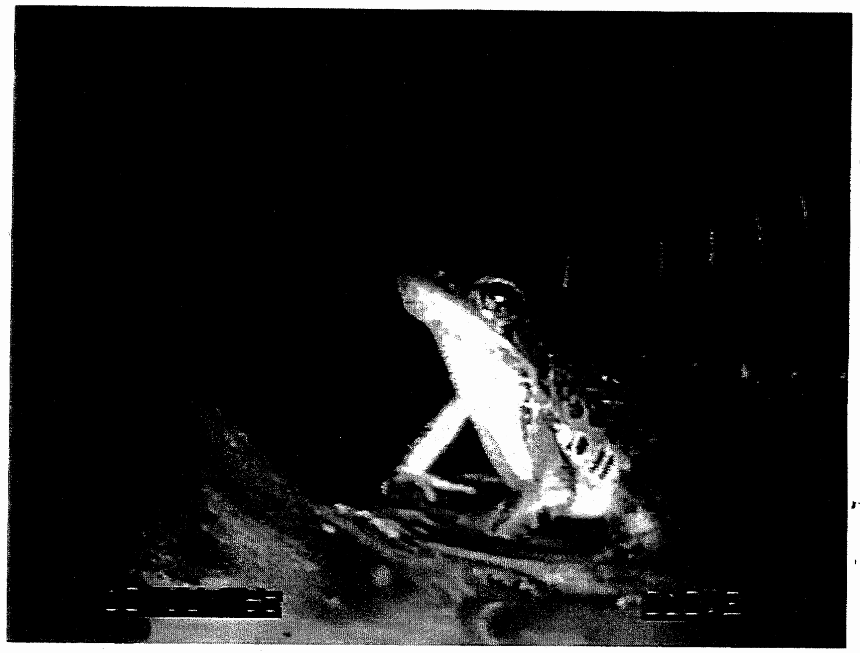


Figure 19. Sags With Standing Water Provide a Desirable Environment for Unwanted Inhabitants.

Figure 20. Rodent's Nests Found Blocking the Mainline at 61.0 Feet.

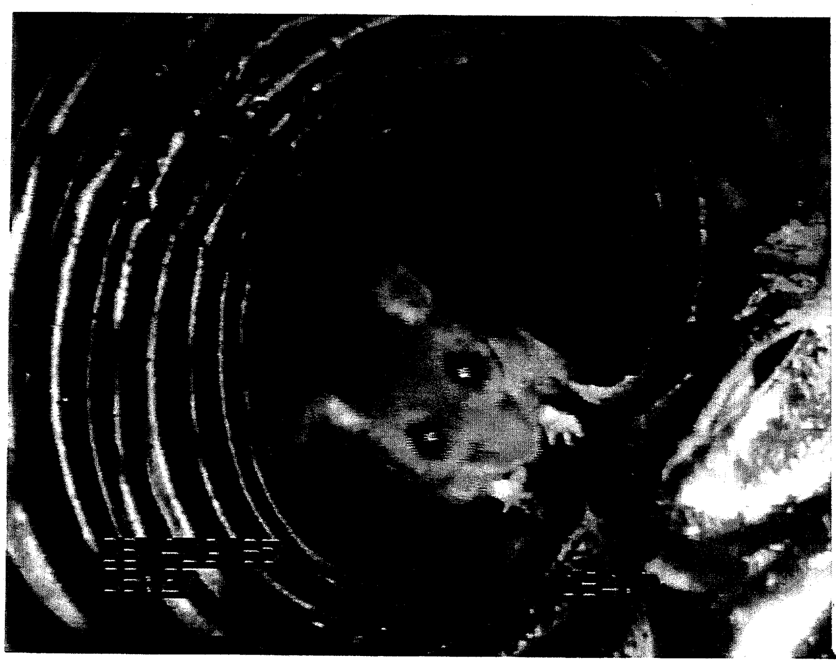


Figure 21. Mouse in Mainline.

incorporated in these systems, this can lead to other obvious unwanted inhabitants (Figures 20 and 21). These and other revealed problems highlight the need for video inspections of highway edgedrain systems as a quality assurance tool for both rehabilitation and new projects. Detailed observations are included in Appendix A.

3.2 Equipment Observations

There are several equipment observations that warrant consideration. The most significant concern was shipment of equipment via air transport. While the equipment was transported in heavy-duty air freight, hardened cases with foam backing, there were several instances where the equipment malfunctioned due to loosened sophisticated internal parts of the camera control unit, the carriage and tapehead assembly within the VCR, and the portable generator itself. All of the problems experienced could easily be associated with excessive force during shipment or due to the lack of observation of right-side up shipping instructions labeled on all shipping containers.

The 100mm x 100mm 90° tee also poses a certain element of difficulty. The stiff nature of this cable is necessary to attain the distances required for these inspections. When the lateral outlet is 90° to the longitudinal mainline, the PVC camera guide can be used to help guide the camera around the 90° tee (Figure 5) without having its transition interrupted by the angular physical geometry of the 90° tee's interior. In a large percentage of the laterals attempted, a significant amount of sediment and/or obstructions were encountered. Therefore, the rigid electrical PVC guide with sweep was required to overcome the silt and other obstacles. In several instances, the lateral outlet was constructed of a flexible corrugated pipe that meandered laterally from one side of the ditch to the other during construction. The result was a lateral outlet which was not a straight line as one might anticipate with a rigid PVC outlet pipe. At times, this caused the angle between the lateral and mainline edgedrain systems to be either less than or greater than 90° immediately at that junction. Those angles less than 90° posed a greater difficulty in negotiating the 100mm x 100mm junction.

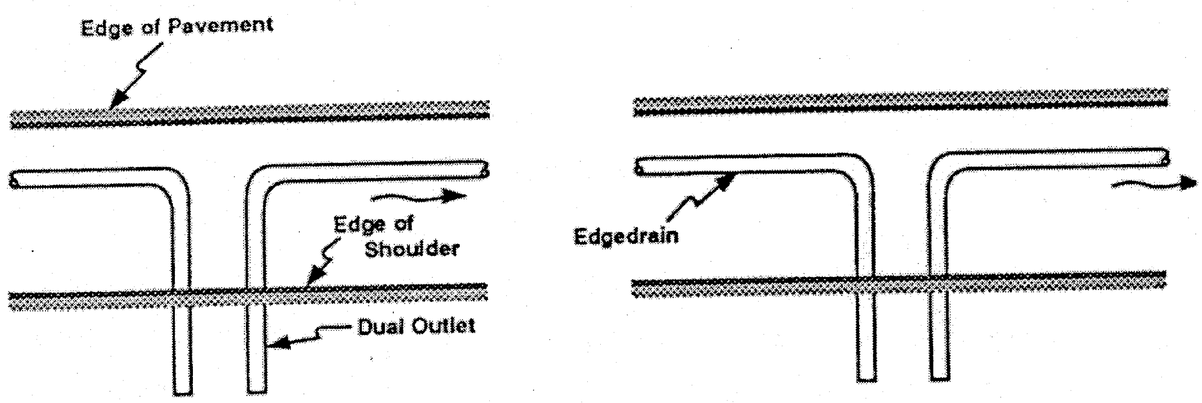


Figure 22. Edgedrain Design for Maintenance.

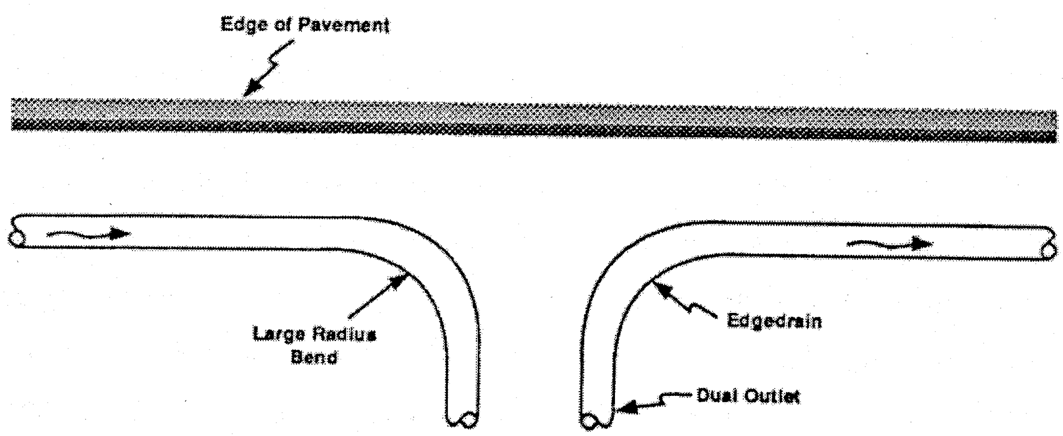


Figure 23. Smooth, Long Radius Bends for Edgedrain Outlet.

the specific equipment utilized on this project was developed for inspecting pipes 75-150mm in diameter. It was realized that when demonstrations were performed on pipes six inches in diameter, lighting approached an inadequate level. Also, there was a significant difference in the quality of video and prints obtained from the solid or rigid white PVC. The interior of the white PVC pipe tended to reflect the light vs. the flexible black pipe interiors which tended to absorb the light.

It was also noticed that corrugation appeared to affect the stability of the camera and lighthead assembly itself. After introducing the assembly over many corrugations, it became apparent that the camera and lighthead assembly would become loosened both internally and externally. The external loosened parts were easily remedied in the field by the technician, however, internal parts requiring attention had to be serviced by the manufacturer. Bituminous coating of those corrugated metal pipe systems also posed a level of difficulty during demonstration/inspections. After a short inspection run, it became apparent that the bituminous coating was easily transferred from the corrugated metal pipe's interior to the cable and subsequently counter assembly. Although minute amounts accumulated in a given short segment of pipe, the amount of bituminous coating over the length of a 150-meter cable required frequent cleaning and maintenance of the equipment.

Inspections/demonstrations of a given edgedrain interior were also complicated by the fact that the miniature systems required to perform an inspection are generally pushrod systems. As a result of the friction build-up between the cable and the pipe's interior which increased as the camera and lighthead assembly progressed down the pipe, a coil-like effect would occur causing the camera and lighthead assembly to rotate within the pipe. Unlike crawler systems which normally don't rotate beyond a 60° angle from vertical, the pushrod systems, at times, present a level of difficulty in discerning an upright position. Also, as a result of this coiling effect, using a Gyroscope Module System to provide both lateral and vertical deviations within the edgedrain system, may not work on a pushrod system. The Gyroscope system requires or utilizes the force of gravity. Once the camera and lighthead assembly rotated to a point beyond 60° from a vertical position, the Gyroscope would no longer be functional and would remain that way until it came back within the vertical range. This could result in the loss of data for several meters at regular intervals each time the Gyroscope rotated from its vertical operating limit.

Video inspection equipment such as the Pearpoint Pushrod System can be operated by one individual, however, this can lead to a variety of limitations if certain circumstances are encountered. The inspection operator must, at all times, be close enough to the camera control unit monitor as the inspection is being conducted, to ensure that the camera and lighthead assembly is not placed in an irretrievable position that would result in the loss of that equipment. The requirement to be near the monitor may result in the need for a second technician for this at times, may preclude inspections in manhole structures, drop inlets and/or steep slopes.

All of the equipment utilized to conduct the inspection/demonstrations for this project had a combined weight of approximately 250 kilograms and was divided up into three shipping containers, the largest of which weighed approximately 90 kilograms. This could present problems if the operator is of questionable physical capabilities or has a history of back trouble. For this project, a portable dolly was utilized for the transport of equipment down all inclines to the lateral outlet. The dolly was also fashioned with an additional set of wheels up towards the handle, which facilitated the stowage of the equipment into the transport vehicle.

4.0 CONCLUSIONS

With continuing advances in technology, closed-circuit video monitoring systems are now being produced economically and sufficiently field worthy to effectively be used in the inspection of these edgedrain systems. The use of the video system is very beneficial for both maintenance and rehabilitation on existing systems as well as a quality control measure for new systems. All the components of this system can be operated by one person in the field. More importantly, substantial cost savings can be realized by the State Highway Agency who accurately identifies specific areas requiring repair rather than making assumptions because of the inability to properly inspect these systems. In addition, the application for this technology appears to extend well beyond this specific application.

5.0 RECOMMENDATIONS

Most states could benefit from additional quality control measures when constructing edgedrain systems. Some states (Arkansas, Michigan, Oklahoma and Virginia) are initiating the use of quality control specifications which require the use of video inspection prior to acceptance, however, the use of such specifications is still relatively new. Obviously crushed drains identified during inspection must be corrected but tolerances for acceptable deviations from grade (sags) or tolerable levels of silt infiltrations must be refined with experience. In all likelihood, the increased use of such specifications will drive improvements in the design of such systems and selection of materials.

Edgedrain design is already experiencing changes such as less angular connections (and dual outlets Figures 22 and 23) to facilitate performance and use of inspection and clean-out equipment. From these initial demonstrations one could identify materials which appear to be better suited for use in edgedrain systems. Such a practice for selection of materials can be very misleading. Evaluations incorporating initial materials and construction costs, maintenance and replacement costs were beyond the scope of this project. However, as quality control specifications come into play, such considerations will typically find their own natural balance.

As a result of the overwhelming information gathered from this project, it would appear that many of the states could also benefit from a more aggressive maintenance program. This would include the clearing of debris and vegetation at the lateral outlet, maintaining, marking and/or location programs, use of better rodent screens, as well as a periodic inspection/flushing maintenance activity. Maintenance systems which consist of a high pressure pump and water storage tank along with a reel of flexible high pressure hose outfitted with a jetted nozzle are currently in use in some states (Oklahoma) to help facilitate a maintenance-flushing program. The high pressure equipment (with pressures between 2,500-3,000 psi) forces a stream of water forward along with several jetted streams directed back towards the lateral outlet's opening. The result is a system which helps to cut through roots and loosen debris facilitating the removal of built-up sediments. The use of a high pressure system coupled with the video inspection equipment could help ensure the viability of a given edgedrain system. This dual system approach could also provide State Highway Agencies with an opportunity to observe whether those fines existing in the lateral outlet are a result of the migration of fines immediately after construction of an edgedrain system or if the fines are continuously migrating from the road bed. This valuable information could help State Highway Agencies to develop specifications, if needed to control base or subbase erosion.

6.0 REFERENCES

1. Federal Highway Administration, "Drainable Pavement Systems", Participant Notebook - Demonstration Project No. 87, March 1992, FHWA-SA-92-008, 400 Seventh Street, S.W., Washington, D.C. 20590.

APPENDIX A

Detailed Observations From Demonstrations

STATE DATE	HWY	MILEPOST	COUNTY	PVM'T TYPE	YEAR BUILT	TERRAIN	SIZE	MAIN LINE TYPE	LATERAL TYPE	RETRO ? YEAR	LATERAL FREQ.	# LATR'LS	TRENCH WRAP
NORTH CAROLINA AUG, 1995	I - 40	277	DURHAM	JPC	1986	Rolling	4	BLK COR	BLK COR	NO	?	4	YES
	I - 40	312	JOHNSTON	JPC	1989	Rolling	4	BLK COR	BLK COR	NO	450	2	YES
	I - 40	312	JOHNSTON	JPC	1989	Rolling	4	BLK COR	WHT PVC	NO	450	1	YES
	I - 40	318	JOHNSTON	JPC	1989	Rolling	4	BLK COR	WHT PVC	NO	450	1	YES
	I - 40	318	JOHNSTON	JPC	1989	Rolling	4	BLK COR	WHT PVC	NO	450	1	YES
	I - 40	329	JOHNSTON	AC	1989	Rolling	4	BLK COR	WHT PVC	NO	450	1	YES
	I - 40	330	JOHNSTON	AC	1989	Rolling	4	BLK COR	WHT PVC	NO	450	2	YES
	I - 40	339	JOHNSTON	AC	1989	Rolling	4	BLK COR	WHT PVC	NO	450	1	YES
	US - 70	US 70 / I-95	JOHNSTON	JPC	1991	----	4	BLK COR	WHT PVC	NO	300	1	YES
	US - 70	US 70 / I-95	JOHNSTON	JPC	1991	----	4	BLK COR	WHT PVC	NO	300	1	YES
	US - 70	US 70 / SR-3	JOHNSTON	AC	1991	----	4	BLK COR	WHT PVC	NO	300	1	YES
	I-485	I-485 / I-77	MEULLENBURG	AC	1994	----	4	BLK COR	WHT PVC	NO	400	1	YES
	I-485	I-485 / I-77	MEULLENBURG	AC	1994	----	4	BLK COR	BLK COR	NO	400	1	YES
	I-485	I-485 / I-77	MEULLENBURG	AC	1994	----	4	BLK COR	BLK COR	NO	400	1	YES
	I-485	MP 100	DAVIDSON	JPC	1982	----	4	BLK COR	BLK COR	NO	500	1	YES
	I-485	MP 100	DAVIDSON	JPC	1982	----	4	BLK COR	BLK COR	NO	500	1	YES
	I-485	MP 100	DAVIDSON	JPC	1982	----	4	BLK COR	BLK COR	NO	500	1	YES
	US - 52	STA 235+00	DAVIDSON	JPC	1994	----	4	BLK COR	BLK COR	NO	300	1	YES
	US - 52	STA 238+00	DAVIDSON	JPC	1994	----	4	BLK COR	BLK COR	NO	300	1	YES
PENNSYLVANIA AUG, 1995	I - 81	640	CUMBERLAND	CRC	1969	----	6	COR METAL	COR METAL	NO	500	1	YES
	I - 81	621	CUMBERLAND	CRC	1969	----	4	CONCRETE	CONCRETE	NO	500	1	YES
	I - 80	272	LUZERNE	CRC	1991	----	4	BLK COR	BLK COR	NO	500	2	YES
	I - 80	272	LUZERNE	CRC	1991	----	4	BLK COR	BLK COR	NO	500	1	YES
	I - 80	272	LUZERNE	CRC	1991	----	4	BLK COR	BLK COR	NO	500	1	YES
	I - 81	145	LUZERNE	CRC	1967	----	6	COR METAL	COR METAL	NO	500	1	YES
	I - 81	145	LUZERNE	CRC	1967	----	6	COR METAL	COR METAL	1985	500	1	YES
	I - 81	EXIT 21	DAUPHIN	CRC	1995	----	6	BLK COR	BLK COR	NO	500	1	YES
NEW JERSEY AUG, 1995	I - 195	30	MONMOUTH	AC	1980	----	6	COR METAL	COR METAL	NO	500	1	YES
	I - 195	30	MONMOUTH	AC	1980	----	6	COR METAL	COR METAL	NO	500	1	YES
WEST VIRGINIA SEPT, 1995	I - 77	104	KANAWHA	AC / CONC	1970	----	4	BLK COR	BLK COR	NO	100	1	YES
	I - 77	104	KANAWHA	AC / CONC	1970	----	4	BLK COR	BLK COR	NO	100	2	YES
	I - 77	104	KANAWHA	AC / CONC	1970	----	4	BLK COR	BLK COR	NO	250	1	YES
	I - 77	105	KANAWHA	AC / CONC	1970	----	4	BLK COR	BLK COR	NO	250	1	YES
	I - 77	115	KANAWHA	AC / CONC	1970	----	6	GEO SOCK	BLK COR	YES ?	100	1	YES
	I - 77	115	KANAWHA	AC / CONC	1970	----	6	GEO SOCK	BLK COR	YES ?	100	1	YES
	I - 77	117.5	KANAWHA	AC / CONC	1970	----	6	GEO SOCK	BLK COR	YES ?	100	1	YES
	I - 77	122	KANAWHA	AC / CONC	1970	----	6	GEO SOCK	BLK COR	YES ?	100	2	YES
	I - 77	147.5	KANAWHA	AC / CONC	1970	----	4	BLK COR	BLK COR	NO	250	1	YES
	I - 77	147.5	KANAWHA	AC / CONC	1970	----	4	BLK COR	BLK COR	NO	250	1	YES
	I - 79	35.5	KANAWHA	AC / CONC	1970	----	4	PANEL	PVC	1987	250	1	NO
	I - 79	39.5	KANAWHA	AC / CONC	1970	----	4	PANEL	PVC	1987	250	1	NO
	CODR-G	LORY RD	BOONE	AC	1994	----	4	BLK COR	BLK COR	NO	250	1	YES
	CODR-G	1 MI N. LOGAN	BOONE	AC	1994	----	4	BLK COR	BLK COR	NO	250	3	YES
	CODR-G	BRWNRDG RD	BOONE	AC	1994	----	4	BLK COR	BLK COR	NO	250	1	YES

STATE DATE	HWY	MILEPOST	COUNTY	PVM'T TYPE	YEAR BUILT	TERRAIN	SIZE	MAIN LINE TYPE	LATERAL TYPE	RETRO ? YEAR	LATERAL FREQ.	# LATR'LS	TRENCH WRAP
KENTUCKY OCT, 1995	I - 264	16	JEFFERSON	JPC	1995	ROLLING	4	BLK COR	BLK COR	NO	250	3	YES
	I - 65	45	BARREN	AC/JPC	?	----	4	BLK COR	BLK COR	NO	500	1	YES
	I - 65	45	BARREN	AC/JPC	?	----	4	BLK COR	BLK COR	NO	500	1	YES
	I - 65	45	BARREN	AC/JPC	?	----	4	BLK COR	BLK COR	NO	250	1	YES
	I - 65	33	WARREN	AC/JPC	?	----	4	BLK COR	BLK COR	NO	250	1	YES
	I - 65	34	WARREN	AC/JPC	?	----	4	BLK COR	BLK COR	NO	500	1	YES
TENNESSEE OCT, 1995	BRILEY P	25	DAVIDSON	AC	1993	SLOPE	4	BLK COR	BLK COR	NO	250	1	YES
	BRILEY P	25	DAVIDSON	AC	1993	SLOPE	4	BLK COR	BLK COR	NO	250	2	YES
	BRILEY P	25	DAVIDSON	AC	1993	SLOPE	4	BLK COR	BLK COR	NO	250	1	YES
	I - 24	36	DAVIDSON	AC / JCP	1980	CUT	4	BLK COR	BLK COR	?	250	1	NO
	I - 24	32	DAVIDSON	AC / JCP	1980	CUT	4	BLK COR	BLK COR	?	250	1	NO
	I - 65	99	SUMNER	8" AC	?	CUT	4	BLK COR	BLK COR	1993	250	1	NO
	I - 65	99	SUMNER	8" AC	?	CUT	4	BLK COR	BLK COR	1993	250	1	NO
MISSISSIPPI OCT, 1995	US - 61	S. OF VICKSBURG	WARREN	AC	?	CUT	6	PVC	PVC	1994	---	1	YES
	US - 61	S. OF VICKSBURG	WARREN	AC	1994	SLOPE	4	PVC	PVC	1993	IRREG	1	YES
	I - 20	15	WARREN	JPC - 13"	1994	ROLLING	4	PVC	PVC	NO	500'	1	YES
	I - 20	46	RANKIN	JPC	1995	ROLLING	4	PVC	PVC	NO	IRREG	1	YES
	I - 20	46	RANKIN	JPC	1995	ROLLING	4	PVC	PVC	NO	IRREG	1	YES
	I - 20	55	RANKIN	AC/JPC	1994	ROLLING	4	PVC	PVC	NO	200'	1	YES
	I - 20	55	RANKIN	AC/JPC	1994	ROLLING	4	PVC	PVC	NO	200'	1	YES
	US - 45	ST. RT. 19	LAUDERDALE	JPC	1994	SLOPE	4	PVC	PVC	NO	200'	1	YES
	US - 45	ST. RT. 19	LAUDERDALE	JPC	1994	SLOPE	4	PVC	PVC	NO	200'	1	YES
	US - 45	US - 45 / ST. RT. 19	LAUDERDALE	JPC	1994	SLOPE	4	PVC	PVC	NO	200'	1	YES
	US - 45	US - 45 / ST. RT. 19	LAUDERDALE	JPC	1994	SLOPE	4	PVC	PVC	NO	200'	1	YES
	US - 45	US 145	LAUDERDALE	JPC	1994	FILL	4	PVC	PVC	NO	200'	1	YES
	US - 45	US 145	LAUDERDALE	JPC	1994	FILL	4	PVC	PVC	NO	200'	1	YES
ALABAMA OCT, 1995	US - 82	82	BIBB	AC	1995	CUT	4	FRENCH	PVC	NO	250'	1	YES
	US - 82	82	BIBB	AC	1995	CUT	4	FRENCH	PVC	NO	250'	1	YES
	US - 82	82	BIBB	AC	1995	CUT	4	FRENCH	PVC	NO	250'	1	YES
	I - 65	205	CHILTON	AC	1962	ROLLING	4	FRENCH	FIBER	1977	500	1	YES
	I - 65	205	CHILTON	AC	1962	ROLLING	4	FRENCH	FIBER	1977	500	1	YES
	I - 65	205	CHILTON	AC	1962	ROLLING	4	FRENCH	FIBER	1977	500	1	YES
	US - 280 /	134 (NOT A TS)	LEE	AC	1992	ROLLING	4	CORR BLK	CORR BLK	NO	250'	1	YES
	US - 280 /	134 (010107)	LEE	AC	1992	ROLLING	4	CORR BLK	CORR BLK	NO	250'	1	YES
	US - 280 /	134 (010109)	LEE	AC	1992	ROLLING	4	CORR BLK	CORR BLK	NO	250'	1	YES

STATE DATE	HWY	MILEPOST	COUNTY	PVM'T TYPE	YEAR BUILT	TERRAIN	SIZE	MAIN LINE TYPE	LATERAL TYPE	RETRO ? YEAR	LATERAL FREQ.	# LATR'LS	TRENCH WRAP
ARKANSAS	I - 40	140	PULASKI	JPC - 9"	1985	FILL	4	CORR BLK	CORR BLK	NO	300'	1	YES
NOV, 1995	I - 40	140	PULASKI	JPC - 9"	1985	FILL	4	CORR BLK	CORR BLK	NO	300'	2	YES
	I - 40	140	PULASKI	JPC - 9"	1985	FILL	4	CORR BLK	CORR BLK	NO	300'	1	YES
	I - 40	140	PULASKI	JPC - 9"	1985	FILL	4	CORR BLK	CORR BLK	NO	300'	1	YES
	I - 40	140	PULASKI	JPC - 9"	1985	FILL	4	CORR BLK	CORR BLK	NO	300'	1	YES
	I - 40	144	PULASKI	JPC - 9"	1985	FILL	4	CORR BLK	CORR BLK	NO	300'	1	YES
	I - 40	144	PULASKI	JPC - 9"	1985	FILL	4	CORR BLK	CORR BLK	NO	300'	1	YES
	I - 40	144	PULASKI	JPC - 9"	1985	FILL	4	CORR BLK	CORR BLK	NO	300'	1	YES
	I - 40	140	PULASKI	JPC - 9"	1985	FILL	4	CORR BLK	CORR BLK	NO	300'	1	YES
	I - 40	40	CLARK	JPC	1985	FILL	4	CORR BLK	CORR BLK	NO	300'	1	YES
	I - 40	40	CLARK	JPC	1985	FILL	4	CORR BLK	CORR BLK	NO	300'	1	YES
	SR - 540	1	CRAWFORD	JPC	1994	CUT	4	CORR BLK	CORR BLK	NO	300'	1	YES
	SR - 540	1	CRAWFORD	JPC	1994	SLOPE	4	CORR BLK	CORR BLK	NO	300'	1	YES
	SR - 540	1	CRAWFORD	JPC	1994	SLOPE	4	CORR BLK	CORR BLK	NO	300'	1	YES
	SR - 540	1	CRAWFORD	JPC	1994	SLOPE	4	CORR BLK	CORR BLK	NO	300'	1	YES
	SR - 540	6	CRAWFORD	JPC	1995	SLOPE	4	CORR BLK	PVC-THIN	NO	300'	1	YES
	SR - 540	6	CRAWFORD	JPC	1995	SLOPE	4	CORR BLK	PVC-THIN	NO	300'	1	YES
	SR - 540	6	CRAWFORD	JPC	1995	SLOPE	4	CORR BLK	PVC-THIN	NO	300'	1	YES
	SR - 540	10	CRAWFORD	JPC	1995	SLOPE	4	CORR BLK	PVC-THIN	NO	300'	1	YES
	SR - 540	10	CRAWFORD	JPC	1995	SLOPE	4	CORR BLK	PVC-THIN	NO	300'	1	YES
	I - 30	32	HEMPSTEAD	JPC	1970	FILL	4	CORR BLK	CORR BLK	1985	300'	1	YES
	I - 30	37	HEMPSTEAD	AC/JPC	1970	ROLLING	4	CORR BLK	CORR BLK	1985	300'	1	YES
	I - 30	37	HEMPSTEAD	AC/JPC	1970	ROLLING	4	CORR BLK	CORR BLK	1985	300'	1	YES
	I - 30	38	HEMPSTEAD	JPC	1970	ROLLING	4	CORR BLK	CORR BLK	1985	300'	1	YES
	I - 30	40	HEMPSTEAD	JPC	1970	ROLLING	4	CORR BLK	CORR BLK	1985	300'	1	YES
	I - 30	46	HEMPSTEAD	JPC	1970	ROLLING	4	CORR BLK	CORR BLK	1985	300'	1	YES
	I - 30	49	HEMPSTEAD	JPC	1970	ROLLING	4	CORR BLK	CORR BLK	1985	300'	1	YES
	I - 30	41	NEVADA	JPC	1970	ROLLING	4	CORR BLK	CORR BLK	1985	300'	1	YES
LOUISIANA	LA - 3132	3	CADDO	JPC - 10"	1985	ROLLING	4	CORR BLK	CORR BLK	NO	200'	1	YES
NOV, 1995	I - 49	2	LAFAYETTE	AC/JPC	1965	ROLLING	4	CORR BLK	CORR BLK	NO	250'	1	YES
	I - 10	101	LAFAYETTE	10" PCC	1965	ROLLING	4	CORR BLK	CORR BLK	NO	250'	1	YES
	I - 12	37	TANGIAPAHOA	10" JRCP	1965	ROLLING	4	CORR BLK	CORR BLK	1987	300'	1	YES
	I - 12	37	TANGIAPAHOA	10" JRCP	1965	ROLLING	4	CORR BLK	CORR BLK	1987	300'	1	YES
	I - 12	37	TANGIAPAHOA	10" JRCP	1965	ROLLING	4	CORR BLK	CORR BLK	1987	300'	1	YES
	I - 10	152	W. BAT ROUGE	10" JRCP	1965	ROLLING	4	CORR BLK	CORR BLK	YES ?	300'	1	YES
	I - 10	152	W. BAT ROUGE	10" JRCP	1965	ROLLING	4	CORR BLK	CORR BLK	YES ?	300'	1	YES
	I - 10	152	E. BAT ROUGE	TB / 8" CRC	1965	ROLLING	4	GEOCOMP	CORR BLK	1993	300'	1	YES
	I - 12	4	E. BAT ROUGE	10"-14"JRCP	1990	ROLLING	4	CORR BLK	CORR BLK	NO	300'	1	YES
SO. CAROLINA	I - 85	73	SPARTANBURG	JCP	1994	ROLLING	4	PVC	CORR BLK	NO	250'	1	YES
NOV, 1995	I - 85	73	SPARTANBURG	JCP	1994	ROLLING	4	PVC	CORR BLK	NO	250'	1	YES
	I - 85	73	SPARTANBURG	JCP	1994	ROLLING	4	PVC	CORR BLK	NO	250'	1	YES
	I - 85	73	SPARTANBURG	JCP	1994	ROLLING	4	PVC	CORR BLK	NO	250'	1	YES
	I - 85	73	SPARTANBURG	JCP	1994	ROLLING	4	PVC	CORR BLK	NO	250'	1	YES
	I - 85	73	SPARTANBURG	JCP	1994	ROLLING	4	PVC	CORR BLK	NO	250'	1	YES
	I - 77	54	CHESTER	AC / JCP	1984	ROLLING	4	CORR BLK	THIN DRAIN	1985	500'	1	YES
	I - 77	56	CHESTER	AC / JCP	1984	ROLLING	4	PVC	PVC	1985	500'	1	YES
	I - 77	57	CHESTER	AC / JCP	1984	ROLLING	4	PVC	PVC	1985	500'	1	YES
	I - 77	61	CHESTER	AC / JCP	1984	ROLLING	4	PVC	PVC	1985	500'	1	YES

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FLORIDA	I - 10	158	JACKSON	JCP	1978	ROLLING	4	CORR BLK	CORR BLK	NO	-	1	YES
FEB, 1996	I - 10	148	JACKSON	JCP	1978	ROLLING	4	CORR BLK	CORR BLK	1985	500'	2	YES
	SR 436/C	DETENTION POND	ORANGE	-	-	ROLLING	6	PVC	CORR BLK	-	-	1	NO
	I - 75	256	HILLSBOROUG	JCP	1984	ROLLING	6	CORR BLK	CORR BLK	NO	500'	1	YES
	I - 75	256	HILLSBOROUG	JCP	1984	ROLLING	6	CORR BLK	CORR BLK	NO	500'	1	YES
	I - 75	256 MEDIAN	HILLSBOROUG	JCP	1984	ROLLING	6	CORR BLK	CORR BLK	NO	500'	1	YES
ILLINOIS	I - 39	11	WOODFORD	CRC	1988	ROLLING	4	CORR BLKx2	CORR BLK	NO	500'	1	YES
APR, 1996	I - 39	10	WOODFORD	CRC	1988	ROLLING	4	CORR BLKx2	CORR BLK	NO	500'	1	YES
	I - 39	8	McLEAN	CRC	1988	ROLLING	4	MONSANTO	PVC/PERF	NO	500'	1	NO
	I - 39	7	McLEAN	CRC	1988	ROLLING	4	MONSANTO	CORR BLK	NO	500'	1	NO
INDIANA	I - 65	115/#1	MARION	AC	1994	ROLLING	6	CORR BLK	PVC	YES/?	500'	1	YES
APR, 1996	I - 65	115/#2	MARION	AC	1994	ROLLING	6	CORR BLK	PVC	YES/?	500'	1	YES
	I - 65	107	MARION	JPC	1994	ROLLING	6	CORR BLK	PVC	YES/?	500'	1	YES
OHIO	I - 70	148/#1	MUSILINGUM	AC	1994	ROLLING	4	GEOCOMP	PVC	NO	500'	1	NO
APR, 1996	I - 70	148/#2	MUSILINGUM	AC	1994	ROLLING	4	GEOCOMP	PVC	NO	500'	1	NO
	I - 70	136/#1	LICKING	AC	1995	SLOPE	6	CORR BLK	CORR BLKx2	NO	500'	1	YES
	I - 70	136/#2	LICKING	AC	1995	SLOPE	6	CORR BLK	CORR BLKx2	NO	500'	1	YES
MICHIGAN	US - 27N	STA 1374+50/2	CLINTON	JPC	1996	ROLLING	6	CORR BLK	CORR BLK	NO	500'	1	YES
APR, 1996	US - 27N	STA 1374+50/1	CLINTON	JPC	1996	ROLLING	6	CORR BLK	CORR BLK	NO	500'	1	YES
	US - 27S	STA 1374+50/3	CLINTON	JPC	1996	ROLLING	6	CORR BLK	PVC	NO	500'	1	YES
	US - 27S	STA 1418+00/1	CLINTON	JPC	1996	ROLLING	6	CORR BLK	PVC	NO	500'	1	YES
	US - 27N	STA 1433+00/1	CLINTON	JPC	1996	ROLLING	6	CORR BLK	PVC	NO	500'	1	YES
	US - 27S	STA 1433+00/1	CLINTON	JPC	1996	ROLLING	6	CORR BLK	PVC	NO	500'	1	YES
CONNECTICUT	I - 84	STA 855 + 00/#1	TOLLAND	AC/CRC	1994	ROLLING	4	CORR BLK	CORR BLK	YES	300'-500'	1	NO
APR, 1996	I - 84	STA 990 + 00/#2	TOLLAND	AC/CRC	1994	ROLLING	4	CORR BLK	CORR BLK	YES	300'-500'	1	NO
	I - 84	STA 1055 + 00/#3	TOLLAND	AC/CRC	1994	ROLLING	4	CORR BLK	CORR BLK	1992	300'-500'	1	NO
	I - 84	STA 1055 + 00/#4	TOLLAND	AC/CRC	1994	ROLLING	4	CORR BLK	CORR BLK	1992	300'-500'	1	NO
	I - 84	STA 500 + 00/#5	TOLLAND	AC/CRC	1994	ROLLING	4	CORR BLK	CORR BLK	1992	300'-500'	1	NO
	I - 84	STA 505 + 00/#5A	TOLLAND	AC/CRC	1994	ROLLING	4	CORR BLK	CORR BLK	1992	300'-500'	1	NO
	I - 84	STA 725 + 00/#6	TOLLAND	AC/CRC	1994	ROLLING	4	CORR BLK	CORR BLK	1992	300'-500'	1	NO
	I - 84W	STA 485 + 00/#1	TOLLAND	AC/CRC	1994	ROLLING	4	CORR BLK	CORR BLK	1992	300'-500'	1	NO
	I - 84W	STA 725 + 00/#1A	TOLLAND	AC/CRC	1994	ROLLING	4	CORR BLK	CORR BLK	1992	300'-500'	1	NO
	I - 84W	STA 1128 + 00/#1	TOLLAND	AC/CRC	1994	ROLLING	4	CORR BLK	CORR BLK	1992	300'-500'	1	NO
	I - 84W	STA 1085 + 00/#2	TOLLAND	AC/CRC	1994	ROLLING	4	CORR BLK	CORR BLK	1992	300'-500'	1	NO
	I - 84W	STA 950 + 00/#3	TOLLAND	AC/CRC	1994	ROLLING	4	CORR BLK	CORR BLK	1992	300'-500'	1	NO
NEW YORK	SR - 9s	STA 1114 + 00/#1	COLUMBIA	AC/GRAN	1994	ROLLING	4	CORR BLK	CORR BLK	1994	300'-500'	1	YES
APR, 1996	SR - 9n	STA 1116 + 00/#1	COLUMBIA	AC/GRAN	1994	ROLLING	4	CORR BLK	CORR BLK	1994	300'-500'	1	YES
	Co. RT - 3	S OF SR - 9	COLUMBIA	AC/GRAN	1994	ROLLING	4	CORR BLK	CORR BLK	1994	300'-500'	1	YES
	I - 87N	127.5/#1	GREEN	AC	1985	ROLLING	6	CORR BLK	CORR BLK	1985	-	1	YES
	I - 87N	127.5/#2	GREEN	AC	1985	ROLLING	6	CORR BLK	CORR BLK	1985	-	1	YES
	I - 87N	127.7/#3	GREEN	AC	1985	ROLLING	6	CORR BLK	CORR BLK	1985	-	1	YES
	I - 90W	166.2/#1	MONTGOMERY	AC/CONC.	1994	SLOPE	6	CORR BLK	CORR BLK	1994	-	1	NO
	I - 90W	166.1/#2	MONTGOMERY	AC/CONC.	1994	SLOPE	6	CORR BLK	CORR BLK	1994	100'-300'	1	NO
	I - 90W	166.2/#3	MONTGOMERY	AC/CONC.	1994	SLOPE	6	CORR BLK	CORR BLK	1994	100'-300'	1	NO

STATE DATE	HWY	MILEPOST	COUNTY	PVM'T TYPE	YEAR BUILT	TERRAIN	SIZE	MAIN LINE TYPE	LATERAL TYPE	RETRO ? YEAR	LATERAL FREQ.	# LATR'LS	TRENCH WRAP
NEW MEXICO MAY, 1996	I - 40W	365	QUAY	JPC	1989	ROLLING	4	THIN	PVC	-	500'	1	YES
	I - 40E	364.3	QUAY	JPC	1989	ROLLING	4	THIN	PVC	-	500'	1	YES
	I - 40E	364.7	QUAY	JPC	1989	ROLLING	4	THIN	PVC	-	500'	1	YES
	I - 40W	329	QUAY	JPC	1990	ROLLING	6	PVC	PVC	-	500'	1	YES
	I - 40W	191.2	TORRANCE	AC	1967	ROLLING	4	CORR BLK	CORR BLK	1988	500'	1	YES
	I - 40W	190.8	TORRANCE	AC	1967	ROLLING	4	CORR BLK	CORR BLK	1988	500'	1	YES
	I - 40W	185	TORRANCE	AC/JPC	1967	ROLLING	6	CORR BLK	CORR BLK	1988	500'	1	YES
	I - 25N/SP	38	DONA ANA	AC	1995	ROLLING	4	PVC	PVC	-	300'	1	YES
	I - 25N/SP	38	DONA ANA	AC	1995	ROLLING	4	PVC	PVC	-	300'	1	YES
	I - 25N/SP	38	DONA ANA	AC	1995	ROLLING	4	PVC	PVC	-	300'	1	YES
	I - 10W	140	DONA ANA	JPC	1967	ROLLING	4	THIN	CORR BLK	1989	500'-1000'	1	NO
	I - 10W	134	DONA ANA	JPC	1967	ROLLING	4	THIN	CORR BLK	1989	500'-1000'	1	NO
	I - 10W	134	DONA ANA	JPC	1967	ROLLING	4	THIN	CORR BLK	1989	500'-1000'	1	NO
	I - 10E	134	DONA ANA	JPC	1967	ROLLING	4	THIN	CORR BLK	1989	500'-1000'	1	NO
ARIZONA MAY, 1996	I - 40E/SP	203	COCONINO	AC	1991	ROLLING	4	CORR BLK	CORR BLK	-	500'-1000'	1	YES
	I - 40E/SP	203	COCONINO	AC	1991	ROLLING	4	CORR BLK	CORR BLK	-	500'-1000'	1	YES
	I - 40E/SP	203	COCONINO	AC	1991	ROLLING	4	CORR BLK	CORR BLK	-	500'-1000'	1	YES
	I - 40E/SP	203	COCONINO	AC	1991	ROLLING	4	CORR BLK	CORR BLK	-	500'-1000'	1	YES
	US - 93N/	52	MOHAVE	AC	1995	ROLLING	4	PVC	PVC	-	300'	1	YES
	US - 93N/	52	MOHAVE	AC	1995	ROLLING	4	PVC	PVC	-	300'	1	YES
	US - 93N/	52	MOHAVE	AC	1995	ROLLING	4	PVC	PVC	-	300'	1	YES
	US - 93N/	106.3	MARICOPA	PCCP	1993	ROLLING	4	PVC	PVC	-	300'	1	YES
WYOMING JUNE, 1996	I - 80E	7	UINTA	PCC	1992	ROLLING	4	CORR BLKX2	CORR BLKX2	-	400'	1	YES
	I - 80E	13	UINTA	PCC	1992	SLOPE	4	CORR BLKX2	CORR BLKX2	-	400'	1	YES
	I - 80E	20.5	UINTA	PCC	1992	SLOPE	4	CORR BLKX2	CORR BLKX2	-	400'	1	YES
	I - 80E	21.2	UINTA	PCC	1989	SLOPE	4	CORR BLKX2	CORR BLKX2	-	400'	1	YES
	I - 80E	84	SWEETWATER	PCC	1994	SLOPE	4	CORR BLK	CORR BLK	-	400'	1	YES
	I - 80E	84	SWEETWATER	PCC	1994	SLOPE	4	CORR BLK	CORR BLK	-	400'	1	YES
	I - 80E	214	CARBON	PCC	1992	SLOPE	4	CORR BLK	CORR BLK	-	500'	1	YES
	I - 80E	214	CARBON	PCC	1992	SLOPE	4	CORR BLK	CORR BLK	-	500'	1	YES
	I - 80E	214	CARBON	PCC	1992	ROLLING	4	CORR BLK	CORR BLK	-	500'	1	YES
	I - 80E	234	CARBON	PCC	1994	ROLLING	4	CORR BLK	CORR BLK	-	500'	1	YES
	I - 80E	234	CARBON	PCC	1992	ROLLING	4	CORR BLKX2	CORR BLKX2	-	500'	1	YES
	I - 25S	25	LARAMIE	AC/PCC	1989	ROLLING	4	CORR BLKX2	CORR BLKX2	-	500'	1	YES
	I - 25S	25	LARAMIE	AC/PCC	1989	ROLLING	4	CORR BLKX2	CORR BLKX2	-	500'	1	YES
	I - 25S	24	LARAMIE	AC/PCC	1989	ROLLING	4	CORR BLKX2	CORR BLKX2	-	500'	1	YES
	I - 90W	63	JOHNSON	CRCC	1995	ROLLING	4	CORR BLK	CORR BLK	-	500'	1	YES
	I - 90W	63	JOHNSON	CRCC	1995	ROLLING	4	CORR BLK	CORR BLK	-	500'	1	YES
	I - 90W	66	JOHNSON	CRCC	1995	ROLLING	4	CORR BLK	CORR BLK	-	500'	1	YES

STATE DATE	HWY	MILEPOST	COUNTY	PVM'T TYPE	YEAR BUILT	TERRAIN	SIZE	MAIN LINE TYPE	LATERAL TYPE	RETRO ? YEAR	LATERAL FREQ.	# LATR'LS	TRENCH WRAP
MONTANA JUNE, 1996	I - 15N	STA 1727+50	TETON	AC	1995	ROLLING	4	SCH 40	SCH 40	-	250'	1	YES
	I - 15N	STA 1730+00	TETON	AC	1995	ROLLING	4	SCH 40	SCH 40	-	250'	1	YES
	I - 15N	STA 1809+50	PONDERA	AC	1995	ROLLING	4	SCH 40	SCH 40	-	250'	1	YES
	I - 15N	STA 1809+50/MED	PONDERA	AC	1995	ROLLING	4	SCH 40	SCH 40	-	250'	1	YES
	I - 15N	STA 1879+50	PONDERA	AC	1995	ROLLING	4	SCH 40	SCH 40	-	250'	1	YES
	I - 15N	STA 1946+50	PONDERA	AC	1995	ROLLING	4	SCH 40	SCH 40	-	250'	1	YES
	I - 15N	STA 1974+50	PONDERA	AC	1995	ROLLING	4	SCH 40	SCH 40	-	250'	1	YES
	I - 90E	STA 30+79	BIGHORN	AC	1996	ROLLING	4	CORR BLK	CORR BLK	-	75M	1	YES
	I - 90E	STA 59+64	BIGHORN	AC	1996	ROLLING	4	CORR BLKX2	CORR BLKX2	-	75M	1	YES
	I - 90E	STA 59+64	BIGHORN	AC	1996	ROLLING	4	CORR BLKX2	CORR BLKX2	-	75M	1	YES
	I - 90E	STA 61+14/A	BIGHORN	AC	1996	ROLLING	4	CORR BLKX2	CORR BLKX2	-	75M	1	YES
	I - 90E	STA 61+14/B	BIGHORN	AC	1996	ROLLING	4	CORR BLKX2	CORR BLKX2	-	75M	1	YES
	I - 90E	STA 40+90/MED	BIGHORN	AC	1996	ROLLING	4	CORR BLKX2	CORR BLKX2	-	75M	1	YES
OKLAHOMA JULY, 1996	US - 69N	10MILES N./I-40	MUSKOGEE	JPC	1980	ROLLING	4	CORR BLK	CORR BLK	1993	300'	1	YES
	US - 69N	8.3MILES N./I-40	MUSKOGEE	JPC	1980	ROLLING	4	CORR BLK	CORR BLK	1993	300'	1	YES
	US - 69N	11MILES N./I-40	MUSKOGEE	JPC	1980	ROLLING	4	BIT FIBER	BIT FIBER	-	300'	1	YES
	US - 69S	10MILES N./I-40	MUSKOGEE	JPC	1980	ROLLING	4	BIT FIBER	BIT FIBER	1993	300'	1	YES
	US - 69S	1MILES N./I-40	McINTOSH	AC/JPC	1980	ROLLING	4	CORR BLKX2	CORR BLKX2	1993	300'	1	YES
	US - 69S	2.5MILES N./I-40	McINTOSH	AC/JPC	1980	ROLLING	4	CORR BLKX2	CORR BLKX2	1993	300'	1	YES
MARYLAND JULY, 1996	MD-100W	.5MILES W./MD713	ANNE ARUNDE	AC	1994	ROLLING	6	CORR BLK	CORR BLK		25'- 50'	1	YES
	I-95N	43	HOWARD	AC/CRC	1990	ROLLING	6	SCH 40 PVC			VARIED	1	NO
	MD347N	2MILES S./US50	WICOMICO	AC	1988	ROLLING	4	TERRACOTTA			VARIED	1	NO
	MD347N	2MILES S./US50	WICOMICO	AC	1988	ROLLING	6	TERRACOTTA			VARIED	1	NO
	MD347N	2.5MILES S./US50	WICOMICO	AC	1988	ROLLING	12	CMP			VARIED	1	NO
DELAWARE JULY, 1996	SR1N	99.5	KENT	JPC/PATB	1993	ROLLING	6	CPE	CPE		500'	1	YES
	SR1N	108	KENT	JPC/PATB	1993	ROLLING	6	CPE	CPE		500	1	YES
	SR1N	119.5	KENT	JPC	1993	ROLLING	6	CPE	CPE		500'	1	YES
	US113S	STA. 416+50	SUSSEX	AC/PATB	1996	ROLLING	6	CPE	CPE		500'		YES
	OLD BAL	191	NEW CASTLE	AC/GABC	1994	SLOPE	6	CPE	CPE		200'-300'	1	YES
	OLD BAL	397	NEW CASTLE	AC/GABC	1994	SLOPE	6	CPE	CPE		200'-300'	1	YES
	RTE. 273	AT FREEDOM TR.	NEW CASTLE	AC	1996	SLOPE	6	CPE	CPE		300'	1	YES
	RTE. 273	AT FREEDOM TR.	NEW CASTLE	AC	1996	SLOPE	6	CPE	CPE		300'	1	YES
CALFORNIA AUGUST, 1996	I-5N (1-A	14.8	SISKIYOU	AC/PCC	1992	SLOPE	3	SCH 40 PVC	SCH 40 PVC		200'	1	YES
	I-5N (1-B)	14.8	SISKIYOU	AC/PCC	1992	SLOPE	3	SCH 40 PVC	SCH 40 PVC		200'	1	YES
	I-5N	14.9	SISKIYOU	AC/PCC	1992	SLOPE	3	SCH 40 PVC	SCH 40 PVC		200'	1	YES
	I-5N (A)	15.05	SISKIYOU	AC/PCC	1992	SLOPE	3	SCH 40 PVC	SCH 40 PVC		200'	1	YES
	I-5N (B)	15.05	SISKIYOU	AC/PCC	1992	SLOPE	3	SCH 40 PVC	SCH 40 PVC		200'	1	YES
	SR99S	28.6	BUTTE	JPC/ATPB	1986	ROLLING	3	SCH 40 PVC	SCH 40 PVC		VARIED	1	YES
	SR99S	29.5	BUTTE	JPC/ATPB	1986	ROLLING	3	SCH 40 PVC	SCH 40 PVC		VARIED	1	YES
	SR99S	28.05	BUTTE	JPC/ATPB	1986	ROLLING	3	SCH 40 PVC	SCH 40 PVC		VARIED	1	YES
	SR99S	28	BUTTE	JPC/ATPB	1986	ROLLING	3	SCH 40 PVC	SCH 40 PVC		VARIED	1	YES
	SR99N	0.9	SUTTER	AC/ATB	1988	ROLLING	3	SCH 40 PVC	SCH 40 PVC		VARIED	1	YES
	SR99N	1	SUTTER	AC/ATB	1988	ROLLING	3	SCH 40 PVC	SCH 40 PVC		VARIED	1	YES
	SR99N	1.55	SUTTER	AC/ATB	1988	ROLLING	3	SCH 40 PVC	SCH 40 PVC		VARIED	1	YES
	I-505N	7.1	YOLO	JPC	1983	ROLLING	2	GALVANIZED			VARIED	1	YES
	I-505N	7.5	YOLO	JPC	1983	ROLLING	2	GALVANIZED			VARIED	1	YES
	SR113S	6.3	YOLO	JPC	1981	ROLLING	3	SCH 40 PVC	SCH 40 PVC		300'-500'	1	YES
	SR113S	6.2	YOLO	JPC	1981	ROLLING	3	SCH 40 PVC	SCH 40 PVC		300'-500'	1	YES

STATE DATE	HWY	MILEPOST	COUNTY	PVM'T TYPE	YEAR BUILT	TERRAIN	SIZE	MAIN LINE TYPE	LATERAL TYPE	RETRO ? YEAR	LATERAL FREQ.	# LATR'LS	TRENCH WRAP
NEVADA SEPTEMBER, 199	I-15S	50	CLARK	AC	1995	ROLLING	4	SCH 40 PVC	SCH 40 PVC	1995	200'	1	?
	I-15S	50	CLARK	AC	1995	ROLLING	4	SCH 40 PVC	SCH 40 PVC	1995	200'	1	?
	I-15S	50	CLARK	AC	1995	ROLLING	4	SCH 40 PVC	SCH 40 PVC	1995	200'	1	?
	US-95S	76.5	CLARK	JPC		SLOPE	6		CPE		VARIED	1	?
	US-95S	76.5	CLARK	JPC		SLOPE	6		CPE		VARIED	1	?
	US-95S	76.5	CLARK	JPC		SLOPE	6		CPE		VARIED	1	?
MISSOURI OCTOBER, 1996	I-44W	218	CRAWFORD	JPC	1995	ROLLING	4	SCH 40 PVC	SCH 40 PVC		250	1	YES
	I-44W	218	CRAWFORD	JPC	1995	ROLLING	4	SCH 40 PVC	SCH 40 PVC		250	1	YES
	I-44W	218	CRAWFORD	JPC	1995	ROLLING	4	SCH 40 PVC	SCH 40 PVC		250	1	YES
	I-44W	218	CRAWFORD	JPC	1995	ROLLING	4	SCH 40 PVC	SCH 40 PVC		250	1	YES
	I-44W	218	CRAWFORD	JPC	1995	ROLLING	4	SCH 40 PVC	SCH 40 PVC		250	1	YES
VIRGINIA APRIL, 1997	I-95	14	GREENVILLE	CRC	1977	FILL	3	CORR	CORR	1991	300	1	NO
	I-95	14.3	GREENVILLE	CRC	1977	FILL	3	CORR	CORR	1991	300	1	NO
	I-95	14.2	GREENVILLE	CRC	1977	FILL	3	CORR	CORR	1991	300	1	NO
	I-95	14.1	GREENVILLE	CRC	1977	FILL	3	CORR	CORR	1991	300	1	NO
	I-64	213	NEW KENT	CRC	1993	ROLLING	4	CORRUD4	PVC		300	1	YES
	I-64	213	NEW KENT	CRC	1993	ROLLING	4	CORRUD4	PVC		300	1	YES
	I-64	213	NEW KENT	CRC	1993	ROLLING	4	CORRUD4	PVC		300	1	YES
	I-64	213	NEW KENT	CRC	1993	ROLLING	4	CORRUD4	PVC		300	1	YES
	I-64	213	NEW KENT	CRC	1993	ROLLING	4	CORRUD4	PVC		300	1	YES
	I-64	213	NEW KENT	CRC	1993	ROLLING	4	CORRUD4	PVC		300	1	YES
	I-64	213	NEW KENT	CRC	1993	ROLLING	4	CORRUD4	PVC		300	1	YES
	I-64	213	NEW KENT	CRC	1993	ROLLING	4	CORRUD4	PVC		300	1	YES
	I-64	213	NEW KENT	CRC	1993	ROLLING	4	CORRUD4	PVC		300	1	YES
	I-95	107	CAROLINE	ACP	1994	ROLLING	6	PERF PIPE					YES
	I-95	107	CAROLINE	ACP	1994	ROLLING	6	PERF PIPE					YES
HAWAII AUGUST 1997	H-3		HONOLULU	CRC	1994		6	CORR BLK			250		NO
	H-1		HONOLULU	CRC			6	CORR BLK					
	H-61		HONOLULU	ACP		CUT	6	CORR BLK					

RDN'T NST - RODENTS NEST
HS - HEAVILY SILTED
OGWV - OVERGROWN W / VEGETATION
NO HDWL - NO HEADWALL
FWDGRASS - FILLED WITH GRASS

STATE DATE	HWY	PIPE WRAP	Crushed SEGMN'T	RDN'T NST SAGS/H2O	SILT INFIL	MAINLINE INSPECTED	DRAINABLE BASE	OUTLETS IDENTIFIED	OUTLET CONDITION
NORTH CAROLINA	I - 40	NO	LATERAL	SAG	LATERAL	NO		YES / HWY	HS, OGWV
AUG, 1995	I - 40	NO	LATERAL	----	----	NO	5 INCH	YES / HWY	HS, OGWV
	I - 40	NO	NO	NO	NO	433'	5 INCH	YES / HWY	GOOD
	I - 40	NO	MAIN	NO	MAIN	413.5'	5 INCH	YES / HWY	NO HDWL / WEEDS
	I - 40	NO	MAIN	SAGS / H2O	MAIN	400'	5 INCH	YES / HWY	NO HDWL / WEEDS
	I - 40	NO	----	----	----	DROP TEE	----	YES / HWY	NO HDWL
	I - 40	NO	----	----	----	DROP TEE	----	YES / HWY	CONC HDWL GOOD
	I - 40	NO	----	----	----	DROP TEE	----	YES / HWY	CONC HDWL / OGWV
	US - 70	NO	----	YES	LATERAL	----	CR. AGG	YES / HWY	CONC HDWL / GRASS
	US - 70	NO	MAIN	NST,SAGS,H2O	MAIN / LAT	450'	CR. AGG	YES / HWY	CONC HDWL / OGWV
	US - 70	NO	----	----	----	TEE NOT NEGOTIABLE	CR. AGG	YES / HWY	CONC HDWL / FWDGRASS
	I-485	NO	NO	NST	NO	?	8" CTABC	YES / HWY	BROKN PIPE/GRASS
	I-485	NO	----	----	----	TEE NOT NEGOTIABLE	8" CTABC	YES / HWY	COVR'D W/ MULCH
	I-485	NO	----	----	----	TEE NOT NEGOTIABLE	8" CTABC	YES / HWY	----
	I-485	NO	LATERAL	H2O	LATERAL	----	4" CTABC	YES / HWY	CONC HDWL GOOD
	I-485	NO	MAIN	SAGS	MAIN	422'	4" CTABC	YES / HWY	CONC HDWL PLUGGED
	I-485	NO	MAIN	SAGS/H2O-100'	MAIN	480.9'	4" CTABC	YES / HWY	CONC HDWL / OGWV
	US - 52	NO	MAIN	----	MAIN	?	CTABC	YES / HWY	----
	US - 52	NO	----	SAGS / H2O	NO	329'	CTABC	YES / HWY	----
PENNSYLVANIA	I - 81	NO	NO	NO	MAIN	32'	----	NO	NO HDWL - 3' ABOVE DITCH
AUG, 1995	I - 81	NO	NO	NO	LATERAL	0	----	NO	CONC HDWL GOOD
	I - 80	NO	LATERAL	NO	LATERAL	0	----	NO	CINDERBLOCKS
	I - 80	NO	NO	SAGS	MAIN	415'	----	NO	DROP INLET / NEW CONST
	I - 80	NO	MAIN	MAIN	NO	36'	----	NO	CINDERBLOCKS
	I - 81	NO	MAIN	NO	NO	110'	----	NO	CINDERBLOCKS
	I - 81	NO	MAIN	NO	NO	400'	----	NO	CINDERBLOCKS
	I - 81	NO	NO	NO	NO	415'	----	NO	IH UNDER CONST
NEW JERSEY	I - 195	NO	NO	RDNT NST	MAIN	140'	----	NO	DROP INLET
AUG, 1995	I - 195	NO	NO	RDNT NST/SAGS	YES/AGG	104'	----	NO	DROP INLET
WEST VIRGINIA	I - 77	NO	NO	NO	YES	NO	----	NO	CLEAN
SEPT, 1995	I - 77	NO	LATERAL	LAT FULL-H2O	NO	NO	----	NO	CLEAN
	I - 77	NO	NO	LAT FULL-H2O	TEE/FULL	NO	----	NO	CLEAR
	I - 77	NO	NO	NO	LATERAL	NO	----	NO	CLEAR
	I - 77	NO	NO	NO	LATERAL	NO	----	NO	CLEAR
	I - 77	NO	NO	NO	NO	NO	----	NO	CLEAR
	I - 77	NO	SOCK	NO	LATERAL	NO	----	NO	CLEAR
	I - 77	NO	NO	NO	LATERAL	NO	----	NO	CLEAR
	I - 77	NO	LATERAL	NO	NO	NO	----	NO	CLEAR
	I - 77	NO	LATERAL	GRD RAIL	NO	NO	----	NO	CLEAR
	I - 79	YES	NO	NO	NO	NO	----	NO	CLEAR
	I - 79	YES	NO	NO	NO	NO	----	NO	CLEAR
	CODR-G	NO	NO	H2O	LATERAL	NO	----	NO	CLEAR
	CODR-G	NO	LATERAL	NO	NO	NO	----	NO	CLEAR
	CODR-G	NO	LATERAL	NO	NO	NO	----	NO	CLEAR

STATE DATE	HWY	PIPE WRAP	Crushed SEGMN'T	RDN'T NST SAGS/H2O	SILT INFIL	MAINLINE INSPECTED	DRAINABLE BASE	OUTLETS IDENTIFIED	OUTLET CONDITION
KENTUCKY OCT, 1995	I - 264	NO	LATERAL	NO	NO	NO	----	NO	CLEAR
	I - 65	NO	MAIN	SAGS / MAIN	MAIN	230'	BRK/SEAT	NO	CLEAR
	I - 65	NO	MAIN/150'	UNCUPL'D / MAIN	MAIN	150.5'	BRK/SEAT	NO	CLEAR
	I - 65	NO	MAIN / 95'	NO	NO	95.5'	BRK/SEAT	NO	OGWV
	I - 65	NO	NO	NO	MAIN	258'	RUBBLE	NO	OGWV
	I - 65	NO	NO	SAGS / MAIN	MAIN	281'	RUBBLE	NO	COVR'D W/ MULCH
TENNESSEE OCT, 1995	BRILEY P	NO	LATERAL	LATERAL / SAG	LATERAL	NO	----	NO	CLEAR
	BRILEY P	NO	LATERAL	NO	NO	NO	----	NO	CLEAR
	BRILEY P	NO	MAIN	MAIN / SAGS	NO	204'	----	NO	CLEAR
	I - 24	NO	MAIN	MAIN / SAGS	MAIN	30'	GRAN	NO	NO HDWL / CLEAR
	I - 24	NO	NO	MAIN / SAGS	MAIN / HVY	100'	GRAN	NO	CLEAR
	I - 65	YES	MAIN / 221'	MAIN / RDN'T	NO	221.5'	----	NO	CLEAR
	I - 65	YES	LATERAL	NO	NO	NO	----	NO	CLEAR
MISSISSIPPI OCT, 1995	US - 61	NO	NO	MAIN / RDN'T	NO	270'	----	YES	CLEAR
	US - 61	NO	NO	BOTTLE @ 5'	@ 9'	NO	----	YES	OGWV
	I - 20	YES	NO	NO	YES	250'	----	YES	COVR'D W/ GRASS + SILTED
	I - 20	NO	NO	NO	YES + AGG	40'	----	YES	CLEAR
	I - 20	NO	NO	SAGS / H2O	YES	155'	----	YES	CLEAR
	I - 20	NO	NO	SAGS/H2O/NST	YES	250'	----	YES	CLEAR
	I - 20	NO	NO	SAGS	MINOR	240'	----	YES	CLEAR
	US - 45	NO	NO	NO	YES+VEG	375'	----	YES	HS, OGWV
	US - 45	NO	NO	NO	YES	220	----	YES	OGWV
	US - 45	NO	NO	NO	NO	350'	----	YES	CLEAR
	US - 45	NO	NO	SAGS / H2O	YES	293' NO CAP	----	YES	CLEAR
	US - 45	NO	NO	SAGS / H2O	MINOR	280' BURRS	----	YES	CLEAR
	US - 45	NO	NO	RDNT NST	NO	350' BURRS	----	YES	CLEAR
ALABAMA OCT, 1995	US - 82	---	NO	NO	NO	LAT TO 24.5'	----	YES	OGWV
	US - 82	---	NO	NO	OUTLET	LAT TO 38'	----	YES	SS, OGWV
	US - 82	---	NO	NO	NO	LAT TO 33'	----	YES	CRUSHED & SILTED
	I - 65	---	NO	NO	YES	NO	SOIL/AGG	THERMOPL	SILTED IN @ 2'
	I - 65	---	LATERAL	ROD NST/SAG	YES	LAT TO 23'	SOIL/AGG	THERMOPL	SS, OGWV
	I - 65	---	NO	NO	YES	LAT TO 26'	SOIL/AGG	THERMOPL	SS, OGWV
	US - 280 /	NO	LATERAL	NO	YES	LAT TO 14'	----	NO	CLEAR
	US - 280 /	NO	NO	SAG	NO	475'	PATB/AGG	YES	CLEAR
	US - 280 /	NO	NO	ROOTS	NO	300'	PATB/AGG	YES	DEAD VEG

STATE DATE	HWY	PIPE WRAP	Crushed SEGMN'T	RDN'T NST SAGS/H2O	SILT INFIL	MAINLINE INSPECTED	DRAINABLE BASE	OUTLETS IDENTIFIED	OUTLET CONDITION
ARKANSAS NOV, 1995	I - 40	NO	LATERAL	NO	NO	NO	AGG	YES	OGWV / MUDDY
	I - 40	NO	LATERAL	SAG	NO	NO	AGG	YES	OGWV / MUDDY
	I - 40	NO	LATERAL	SAG	NO	NO	AGG	YES	OGWV / MUDDY
	I - 40	NO	NO	SAG	NO	TEE NOT NEGOTIABLE	AGG	YES	OGWV / MUDDY
	I - 40	NO	NO	SAG / LAT	14.7'	NO	AGG	YES	OGWV / MUDDY
	I - 40	NO	NO	SAG / LAT	NO	TEE NOT NEGOTIABLE	AGG	YES	OGWV / MUDDY
	I - 40	NO	NO	SAG / LAT	LATERAL	TEE NOT NEGOTIABLE	AGG	YES	OGWV / MUDDY / CLOGGED
	I - 40	NO	NO	SAG / LAT	TEE	NO	AGG	YES	OGWV / MUDDY
	I - 40	NO	NO	SAG / LAT	21.5'	NO	AGG	YES	NOT APPLICABLE
	I - 40	NO	NO	SAG / LAT	33.6'	NO	AGG	YES	OGWV / MUDDY
	I - 40	NO	LAT @ 9'	SAG / LAT	9'	NO	AGG	YES	DROP INLET
	SR - 540	NO	LAT @ 1.3'	SAG / LAT	1.3'	NO	BIT STAB	YES	CLEAR
	SR - 540	NO	LAT @ 5.4'	SAG / LAT	NO	NO	BIT STAB	YES	OGWV
	SR - 540	NO	LAT @ 1.5'	NO	NO	NO	BIT STAB	YES	CLEAR
	SR - 540	NO	MAIN @ 60'	SAG / MAIN	MAIN	YES	BIT STAB	YES	SEMI-OGWV
	SR - 540	NO	NO	SAG / MAIN	MAIN / 75'	YES	RUBBLE	YES	CLEAR
	SR - 540	NO	LATERAL	NO	NO	TEE NOT NEGOTIABLE	RUBBLE	YES	CLEAR
	SR - 540	NO	NO	NO	NO	TEE NOT NEGOTIABLE	RUBBLE	YES	CLEAR
	SR - 540	NO	LAT @ 3.0'	NO	NO	NO	RUBBLE	YES	CLEAR
	SR - 540	NO	NO	SAG / MAIN	MAIN	YES / 270.7'	RUBBLE	YES	CLEAR
	I - 30	NO	NO	SAG / LAT	LATERAL	TEE NOT NEGOTIABLE	CR. STONE	YES	MUDDY
	I - 30	NO	LAT @ 0.5'	NO	NO	NO	CR. STONE	YES	OGWV
	I - 30	NO	LAT @ 7.0'	SAG / LAT	LAT / GRAV	NO	CR. STONE	YES	-----
	I - 30	NO	LAT @ 1.0'	NO	LATERAL	NO	CR. STONE	YES	-----
	I - 30	NO	LAT @ 1.1'	SAG / LAT	LATERAL	NO	CR. STONE	YES	-----
	I - 30	NO	NO	SAG / LAT	LATERAL	TEE NOT NEGOTIABLE	CR. STONE	YES	-----
	I - 30	NO	LAT @ 1.5'	NO	NO	NO	CR. STONE	YES	-----
	I - 30	NO	LAT @ 0.5'	NO	LATERAL	NO	CR. STONE	YES	-----
LOUISIANA NOV, 1995	LA - 3132	NO	MAIN	NO	MAIN	471.9'	SOIL CEM	YES	VEG GROWNG IN OUTLET
	I - 49	NO	NO	NO	LAT @ 1.5'	NO	SOIL CEM	YES	OGWV
	I - 10	NO	MAIN@53.1'	NO	MAIN	YES	SOIL CEM	YES	SEMI-OGWV
	I - 12	NO	LAT @ 3.3'	NO	NO	NO	SOIL CEM	YES	BURIED
	I - 12	NO	NO	SAG / MAIN	MAIN@71.6	YES	SOIL CEM	YES	BURIED
	I - 12	NO	NO	SAG / MAIN	MAIN@127.4	YES	SOIL CEM	YES	BURIED
	I - 10	NO	LAT @ 8.3'	SAG / LAT	LATERAL	NO	6" UKNWN	YES	MUDDY
	I - 10	NO	NO	SAG / LAT	LAT FULL	NO	6" UKNWN	YES	MUDDY
	I - 10	NO	NO	SAG / LAT	LAT+ROOTS	NO	UKNWN	----	MUDDY
	I - 12	NO	LAT @ 3.6'	SAG / LAT	LATERAL	NO	UKNWN	YES	OGWV
SO. CAROLINA NOV, 1995	I - 85	NO	LAT @ TEE	NO	NO	NO	NO	YES	CLEAR
	I - 85	NO	LAT @ TEE	NO	NO	NO	NO	YES	SILTED IN
	I - 85	NO	NO	NO	300' +	YES	NO	YES	CLEAR
	I - 85	NO	NO	NO	90'	YES	NO	YES	CLEAR
	I - 85	NO	LAT @ TEE	NO	NO	NO	NO	YES	PLUGGED / OGWV
	I - 85	NO	LAT @ TEE	NO	NO	NO	NO	YES	CLEAR
	I - 77	NO	NO	NO	THIN DRAIN	NO	NO	YES	SEMI-OGWV
	I - 77	NO	NO	NST/SAGS-MAIN	MAIN	425.1'	NO	YES	CLEAR
	I - 77	NO	NO	SAGS-MAIN	NO	315.'	NO	YES	OGWV
	I - 77	NO	NO	SAGS-LAT	LAT	#2 ROD SCRN	NO	YES	SEMI-OGWV

STATE DATE	HWY	PIPE WRAP	Crushed SEGMN'T	RDN'T NST SAGS/H2O	SILT INFIL	MAINLINE INSPECTED	DRAINABLE BASE	OUTLETS IDENTIFIED	OUTLET CONDITION
FLORIDA	I - 10	NO	LAT @ 2.5'	NO	?	NO	NO	YES	CLEAR
FEB, 1996	I - 10	NO	NO	NO	YES	TO 185'	NO	YES	CLEAR
	SR 436/C	NO	NO	NO	?	TO 165'	NO	NO	BURIED
	I - 75	NO	LAT	SGS/H2O/SILT/M	LAT/MAIN	TO 105'	NO	YES	DROP INLET CLEAR
	I - 75	NO	LAT @ 2'	?	LAT	NO	NO	YES	DROP INLET CLEAR / DRY
	I - 75	NO	LAT @ 3.5'	?	LAT	NO	NO	YES	DROP INLET CLEAR / DRY
ILLINOIS	I - 39	NO	NO	SAG 12'/UNCOUP	NO	unconv tee conn	-	YES	CLEAR
APR, 1996	I - 39	NO	NO	SAG 10'/UNCOUP	NO	unconv conn	-	YES	CLEAR
	I - 39	NO	NO	SILT/1.5', RDNT/1.5',18'	YES	Monsanto Mat	-	YES	CLEAR
	I - 39	NO	NO	SILT 0-20', SAG/9.4'	YES	Monsanto Mat	-	YES	CLEAR
INDIANA	I - 65	NO	YES	SAGS-SLIGHT	NO	470	-	YES	CLEAR
APR, 1996	I - 65	NO	YES/6'	NO	NO	NO	-	NO	CLEAR
	I - 65	NO	YES/6'	NO	HEAVY	200'	-	YES	HVY DEPOSIT SILT
OHIO	I - 70	YES	NO	NO	NO	NO	RUBBILIZED	DI/MEDIAN	CLEAR
APR, 1996	I - 70	YES	NO	NO	15', 42'-55'	DROP TEE	RUBBILIZED	DI/MEDIAN	CLEAR
	I - 70	NO	35.8'	14'/SAG	15'-31', 35'+	HEAVY SILT	RECYCLED	NO	CLEAR/FLOWING
	I - 70	NO	19.2'	NO	0'-13'	TEE NOT NEGOTIABLE	RECYCLED	NO	CLEAR
MICHIGAN	US - 27N	NO	85.7'	58'-85'/SAG	NO	TO CRUSH-85'	-	NO	CLEAR
APR, 1996	US - 27N	NO	MULT	MULT/SAGS	MULT	TO CRUSH-111'	-	NO	CLEAR
	US - 27S	NO	NO	1.2-3.5'/SAGS	GRAV/18'	NO	-	NO	CLEAR
	US - 27S	NO	NO	NO	NO	448'	-	NO	NO HDWL/CLEAR
	US - 27N	NO	NO	MULT SAGS	5'	101.7'	-	CONST	NO HDWL/CLEAR
	US - 27S	NO	NO	NO	NO	150.1'	-	CONST	NO HDWL/CLEAR
CONNECTICUT	I - 84	NO	MULT	YES	NO	321.4	-	YES	CLEAR
APR, 1996	I - 84	NO	MULT	MULT SAGS	5.3', 15.6'	410'	-	YES	CLEAR
	I - 84	NO	NO	SAGS 0-14'	LIGHT 0-188'	334'	-	YES	CLEAR/RUNNING
	I - 84	NO	-	-	-	DROP IN	-	YES	DROP INLET
	I - 84	NO	-	MAIN REMOVED	-	NO MAIN	-	YES	DROP INLET
	I - 84	NO	-	MAIN REMOVED	-	NO MAIN	-	YES	DROP INLET
	I - 84	NO	-	-	-	DROP IN	-	YES	DROP INLET
	I - 84W	NO	LAT 13'	-	-	NO	-	YES	DROP INLET
	I - 84W	NO	LAT 21.2'	NO	MULT	99.6'	-	YES	DROP INLET
	I - 84W	NO	20', 238.3	NO	MULT	238.3'	-	YES	PRE FAB HWDL
	I - 84W	NO	MULT	SAG/31'-49'	MULT	425'/ ELLIPTICAL	-	YES	CLEAR
	I - 84W	NO	29'	RDN'T/24', 61'	NO	303'	-	YES	CLEAR
NEW YORK	SR - 9s	NO	NO	SAG 3.9'	3.9'-5.1'	40'	GRANULAR	NO	CLEAR
APR, 1996	SR - 9n	NO	MULT	SAGS	NO	235.5'/CRUSH	GRANULAR	NO	CLEAR
	Co. RT - 3	NO	31', 130'	SAGS/MULT	MULT	208'/ROCK	GRANULAR	NO	CLEAR/FLOWING
	I - 87N	NO	NO	SAGS/3.3', 6.0'	GRAV/10.5'	NO	NATURAL	NO	DROP INLET
	I - 87N	NO	160'	SAGS/MULT	DEBRI/160'	160'	NATURAL	NO	DROP INLET/CLEAR
	I - 87N	NO	-	SAGS/LAT	LAT	90 TEE	NATURAL	NO	CLEAR
	I - 90W	NO	NO	SAGS/MULT, RDNT/69'	NO	387.4'	9"CONC	NO	SILTED/VEG
	I - 90W	NO	14.9', 34.2'	NO	NO	90 TEE	9"CONC	NO	SILTED/VEG
	I - 90W	NO	NO	RODN'T/42'	NO	90 TEE	9"CONC	NO	SILTED/VEG

STATE DATE	HWY	PIPE WRAP	Crushed SEGMN'T	RDN'T NST SAGS/H2O	SILT INFIL	MAINLINE INSPECTED	DRAINABLE BASE	OUTLETS IDENTIFIED	OUTLET CONDITION
NEW MEXICO MAY, 1996	I - 40W	NO	NO	-	@OUTLET	THIN DRAIN	-	YES	CLEAR
	I - 40E	NO	NO	-	-	THIN DRAIN	-	YES	CLEAR
	I - 40E	NO	LAT/MAIN	-	-	THIN DRAIN	-	YES	CLEAR
	I - 40W	NO	NO	NO	OUT, 91'	104'	-	NO	BROKEN, SILTED
	I - 40W	NO	1.5'	SAG/4.1'. 9'-22'	OUTLET	THIN DRAIN	CRK/SEAT	YES	OVGRWN/VEGITATION
	I - 40W	NO	MULT	SAG/6'-9', 13 -15'	NO	THIN DRAIN	CRK/SEAT	YES	CLEAR
	I - 40W	NO	1', 2.5'	-	-	LAT CRUSH	CRK/SEAT	YES	CLEAR
	I - 25N/SP	NO	-	-	OUTLET	NO/90 TEE	-	YES	CLEAR
	I - 25N/SP	NO	-	-	GRAV@TEE	NO	-	YES	CLEAR
	I - 25N/SP	NO	NO	NO	NO	305'	-	YES	CLEAR
	I - 10W	YES	17'	SAG/15'-18'	0'- 4'	THIN DRAIN	-	YES	SILTED
	I - 10W	YES	NO	NO	ROOTS	THIN DRAIN	-	YES	CLEAR
	I - 10W	YES	NO	NO	0' - 8'	THIN DRAIN	-	YES	SILTED
	I - 10E	YES	-	-	OUTLET	-	-	YES	BELOW GRADE, SILTED
ARIZONA MAY, 1996	I - 40E/SP	NO	-	-	-	345	-	YES	SILTED
	I - 40E/SP	NO	NO	NO	MULT	300	-	YES	HEAVILY SILTED
	I - 40E/SP	NO	NO	NO	MULT	400	-	YES	HEAVILY SILTED
	I - 40E/SP	NO	-	-	-	-	-	YES	SILTED
	US - 93N/	NO	NO	NO	MULT	315	PATB	YES	DEAD VEGITATION
	US - 93N/	NO	NO	NO	50'	345	PATB	YES	COV'D W/DEAD VEGITATION
	US - 93N/	NO	LAT UNCOUP	RODN'T 271'-275'	13'	340	PATB	YES	COV'D W/DEAD VEGITATION
	US - 93N/	NO	LAT UNCOUP	RODN'T @ OUTLET	MULT	23/FRENCH	-	YES	CLEAR
WYOMING JUNE, 1996	I - 80E	NO	MAIN/131',141'	SAGS	MAIN	340	-	YES	CLEAR
	I - 80E	NO	LAT/17.6'	SAGS/17.6'	18'-63'	63'	-	YES	CLEAR
	I - 80E	NO	LAT	RODN'T/120.1'+SAGS	LAT/HVY	430'	-	YES	CLEAR
	I - 80E	NO	LAT/7',8.3'	SAG/LAT	LAT/HVY	470'	-	NO	CLEAR
	I - 80E	NO	-	-	LAT/HVY	LAT/5'	-	NO	CLEAR
	I - 80E	NO	-	-	-	470'	-	NO	CLEAR
	I - 80E	NO	LAT @ 2'	-	-	LAT @ 2'	-	YES	CLEAR
	I - 80E	NO	LAT @ 9'	-	LAT @9.1'	LAT/ 9.1'	-	YES	CLEAR
	I - 80E	NO	3',28',7'-10'	-	3',28',7'-10'	MAIN/28.5'	PATB	YES	CLEAR
	I - 80E	NO	-	-	LAT @ 4.8'	LAT @ 4.8'	-	YES	CLEAR
	I - 80E	NO	LAT @ 6.4'	-	-	LAT @ 6.4'	-	YES	CLEAR
	I - 25S	NO	LAT @ 4.4'	-	-	LAT @ 4.4'	CRSH STON	YES	CLEAR
	I - 25S	NO	-	-	AGG @ 26'	LAT/26'	CRSH STON	YES	CLEAR
	I - 25S	NO	-	-	AGG @ 26'	TEE NOT NEGOTIABLE	CRSH STON	YES	CLEAR
	I - 90W	NO	LAT@27.6'	SAG/H20 @ 10'-14'	-	365'	CTB	YES	SILTED
	I - 90W	NO	-	SAG @ 10'-14'	-	315'	CTB	YES	CLEAR
	I - 90W	NO	LAT@2.6'	-	-	-	CTB	YES	CLEAR

STATE DATE	HWY	PIPE WRAP	Crushed SEGMN'T	RDN'T NST SAGS/H2O	SILT INFIL	MAINLINE INSPECTED	DRAINABLE BASE	OUTLETS IDENTIFIED	OUTLET CONDITION
MONTANA JUNE, 1996	I - 15N	NO	-	SAGS/H20	-	410	PATB	YES	CLEAR
	I - 15N	NO	-	RODN'T/LAT	YES	LAT REQST ONLY	PATB	YES	CLEAR
	I - 15N	NO	-	H20/57'-484'/5-70%	-	484.4'	PATB	YES	CLEAR
	I - 15N	NO	-	H20/16'-75',141'-160',29	-	420'	PATB	YES	CLEAR
	I - 15N	NO	-	H20/16'-438', RDN'T/8.9	-	470.1'	PATB	YES	CLEAR
	I - 15N	NO	-	H20/268'-380'	-	400'	PATB	YES	CLEAR
	I - 15N	NO	-	H20/16'-128'	OBST@128'	128'	PATB	YES	CLEAR
	I - 90E	NO	-	-	-	272.1'	RUBBLE	YES	CLEAR
	I - 90E	NO	19', 172.2'	-	-	275.4'	RUBBLE	YES	CLEAR
	I - 90E	NO	-	-	-	273.4'	RUBBLE	YES	CLEAR
	I - 90E	NO	-	-	-	274.4'	RUBBLE	YES	CLEAR
	I - 90E	NO	-	-	-	274.4'	RUBBLE	YES	CLEAR
	I - 90E	NO	MAIN @ 148.6'	-	-	MAIN @ 148.6'	RUBBLE	YES	CLEAR
OKLAHOMA JULY, 1996	US - 69N	NO	LAT @ 2.9'	SAG @ 2.9'	-	LAT @ 2.9'	-	YES	CLEAR
	US - 69N	NO	MULT IN LAT	MULT SAG IN LAT	ALL	MAIN @ 146'	-	YES	CLEAR
	US - 69N	NO	-	-	AGG	LAT ONLY TO 34'	-	NO	50% BURIED
	US - 69S	NO	MULT IN LAT	MULT SAG IN LAT	AGG @ 59'	MAIN TO 59'	-	YES	CLEAR
	US - 69S	NO	32.4'	-	-	MAIN TO 471.6'	-	YES	CLEAR
	US - 69S	NO	4.2'	-	-	LAT TO 4.2'	-	YES	CLEAR
MARYLAND JULY, 1996	MD-100W	NO	MULT IN LAT	1'-15'/61'-92'	61'-92'	MAIN TO 92'		NO	CLEAR
	I-95N	NO	-	-	-	LAT. TO 29.8'		NO	CLEAR
	MD347N	NO	LAT@1.0'	-	0-2.8'	LAT. TO 2.8'		NO	CLEAR
	MD347N	NO	1.0'	-	19.8'	LAT. TO 19.8'		NO	CLEAR
	MD347N	NO	-	-	-	170.0'		NO	CLEAR
DELAWARE JULY, 1996	SR1N	NO	-	-	-	411'	PATB	NO	CLEAR
	SR1N	NO	-	RDNT NST @27'	@ OUTLET	419'	PATB	NO	HEAVILY SILTED
	SR1N	NO	228'	-	-	343'	PATB	NO	CLEAR
	US113S	NO	-	-	MAIN	275.4'	PATB	NO	CLEAR
	OLD BAL	NO	-	MULT. MAIN	-	132.8'	GABC	NO	CLEAR
	OLD BAL	NO	-	50.8', 99'	168.5'	298.2'	GABC	NO	CLEAR
	RTE. 273	NO	-	-	87.5'	87.5'		NO	CLEAR
	RTE. 273	NO	-	-	-	190.2'		NO	CLEAR
CALIFORNIA AUGUST, 1996	I-5N (1-A	NO	-	RDNT NST @24'	215.1'	215'		NO	CLEAR
	I-5N (1-B)	NO	-	RDNT NST @212'	OUTLETS	228'		NO	MILDLY SILTED
	I-5N	NO	-	-	OUTLETS	290.4'		NO	CLEAR
	I-5N (A)	NO	-	RDNT NST @185'	OUTLET	251.1'		NO	SILTED
	I-5N (B)	NO	-	-	237.2'	237.2'		NO	CLEAR
	SR99S	NO	-	-	-	410.1'	ATPB	YES	BROKEN
	SR99S	NO	-	-	223.3'	223.3'	ATPB	YES	CLEAR
	SR99S	NO	172.5'	-	-	172.5'	ATPB	YES	CLEAR
	SR99S	NO	53.2'	RDNT NST @53.2	-	425.1'	ATPB	YES	BROKEN
	SR99N	NO	-	-	0-2.3'	NONE	ATB	YES	CLEAR
	SR99N	NO	-	RDNT NST @234'	2.5'-19.1'	275.1'	ATB	YES	CLEAR
	SR99N	NO	-	-	-	207'	ATB	YES	BURIED
	I-505N	NO	-	-	-	TEE NOT NEGOTIABLE	ATB	YES	CLEAR
	I-505N	NO	LAT. 18.7	-	-	LAT. 18.7	ATB	YES	CLEAR
	SR113S	NO	-	-	MAIN	191.3		YES	BROKEN
	SR113S	NO	-	RDNT NST @14.8'	-	177.4'		YES	CLEAR

STATE DATE	HWY	PIPE WRAP	Crushed SEGMN'T	RDN'T NST SAGS/H2O	SILT INFIL	MAINLINE INSPECTED	DRAINABLE BASE	OUTLETS IDENTIFIED	OUTLET CONDITION
NEVADA	I-15S	?	-	-	-	210.2'		YES	CLEAR
SEPTEMBER, 199	I-15S	?	-	-	-	250'		YES	CLEAR
	I-15S	?	-	-	-	270'		YES	CLEAR
	US-95S	?	-	-	-	LAT ONLY TO 2.7'		YES	COVERED WITH AGGR.
	US-95S	?	-	-	-	END CAP @ 10.7'		YES	COVERED WITH AGGR.
	US-95S	?	-	-	-	LAT ONLY TO 9.7'		YES	COVERED WITH AGGR.
MISSOURI	I-44W	YES	-	-	-	TEE NOT NEGOTIABLE	4" PATB	YES	CLEAR
OCTOBER, 1996	I-44W	YES	-	-	-	220'	4" PATB	YES	CLEAR
	I-44W	YES	-	-	-	TEE NOT NEGOTIABLE	4" PATB	YES	CLEAR
	I-44W	YES	-	-	-	215'	4" PATB	YES	CLEAR
	I-44W	YES	-	-	-	360'	4" PATB	YES	CLEAR
VIRGINIA	I-95	NO	-	-	-	307'		YES	CLEAR
APRIL, 1997	I-95	NO	-	-	-	316'		YES	CLEAR
	I-95	NO	-	-	-	LAT ONLY TO 2.2'		YES	CLEAR
	I-95	NO	-	H20/22'-246'	-	310'		YES	CLEAR
	I-64	NO	-	NEST @ 29.2	-	TO NEST @ 29.2		YES	CLEAR
	I-64	NO	-	-	-	TO NAIL @ 45.2		YES	CLEAR
	I-64	NO	-	-	-	TO NAIL @ 62		YES	CLEAR
	I-64	NO	-	-	-	TO NAIL @ 69		YES	CLEAR
	I-64	NO	-	-	-	TO NAIL @ 104		YES	CLEAR
	I-64	NO	-	-	-	TO NAIL @ 35		YES	CLEAR
	I-64	NO	-	-	-	266'		YES	CLEAR
	I-64	NO	-	-	-	TO NAIL @ 27.5		YES	CLEAR
	I-64	NO	-	-	-	TO NAIL @ 50		YES	CLEAR
	I-95		-	-	-	384'		YES	CLEAR
	I-95		-	H20/10'-50'	-	285'		YES	CLEAR
HAWAII	H-3	NO	-	-	-	250'		YES	CLEAR
AUGUST 1997	H-1					TEE NOT NEGOTIABLE		YES	CLEAR
	H-61		-	-	-	250'		YES	CLEAR

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APPENDIX B

Guide Specification for Video Edgedrain Inspection

Draft
Guide Specification
For
Video Edge Drain Inspection
And
Acceptance

1.0 Scope

1.1 This guide specification provides a methodology for video inspection of edgedrain pipe systems conducted as part of their original installation during new construction or retrofitted edgedrains incorporated in an existing paved surface. This specification also provides guidance for the final acceptance of the edgedrain system

1.2 This specification does not address the installation of the edgedrain system.

1.3 This specification is not specifically intended for inspections of existing edgedrain systems during maintenance operations, but can readily be adapted for such operations.

1.4 This specification does not purport to address all of the safety problems associated with its use. It is the responsibility of whomever uses this specification to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to its use for video edgedrain inspection.

2.0 Equipment

2.1 Camera - A high resolution, high sensitivity, waterproof color video camera will be required that has been engineered to inspect pipes 75 mm to 150 mm in diameter. The camera must be capable of negotiating a 90 degree angle from one 100 mm diameter pipe to another 100 mm diameter pipe. Sufficient lighting must be provided by the camera to provide a clear "true" color picture of the entire periphery of a 100 mm diameter pipe. The camera should be designed with appropriate attachments such that the camera itself maintains a position in the center of the pipe during inspections.

2.2 Camera Control Unit - The controls for the camera should be incorporated in a portable unit capable of adjusting iris, focus and light level intensity. The control unit shall include a built-in 200 mm color monitor (or greater) for tracking the cameras progress through the inspections, two video input/output jacks for video recording as well as tape playback verification through the built-in monitor. Audio input shall also be provided to allow for dubbing of the video tapes to incorporate comments as necessary.

2.3 Metal Coiler and Push Rod With Counter - Sufficient cable/push rod is required to conduct inspections to a length of 150 meters. In order to facilitate lengthy inspections the push rod system must be sufficiently rigid and designed with a coating that minimizes frictional resistance between the cable and the pipe. The portable coiling system shall be equipped with a distance counter for monitoring length of inspection.

2.4 Color Video Printer - A video printer shall be incorporated into the system to produce color prints of any observations of interest during the course of an inspection. The video printer shall be directly connected to the camera control unit to insure prints of the highest quality possible.

2.5 Video Cassette Recorder - The video cassette recorder shall be a high quality four head industrial grade VHS type recorder with audio dubbing, still frame, and slow speed capabilities.

2.6 Generator - A compact portable generator shall be provided with sufficient capacity to power the inspection equipment.

3.0 Safety

3.1 Awareness of nearby traffic is essential. Traffic control may be warranted under some circumstances.

3.2 Special attention around drainage areas is warranted to be alert for snakes, rodents and other potential inhabitants.

3.3 Safety gear such as hardhats, reflective vests may be warranted based on proximity to traffic and or construction operations.

3.4 The physical requirements of the inspection procedures will require a technician in good health and cognizant of proper lifting procedures.

4.0 Technician Qualifications

4.1 The operator of the video inspection equipment must have a good mechanical aptitude.

4.2 A working knowledge of standard video equipment is required.

4.3 Video inspection requires lifting of large heavy containers (40 kilograms) and the ability to push 150 meters of rigid video cable through drain pipe and retrieve and recoil the cable upon completion of the inspection. Good health and physical fitness are essential.

4.4 Knowledge of appropriate safety precautions is advisable.

5.0 Inspection

5.1 All mainline edgedrains and lateral outlets installed on this project will be subject to video inspections.

5.2 Random video spot-checks will be made at the Engineer's discretion. The random checks will be conducted on no less than 10 percent of the lateral outlets and extending to 150 meters down the mainline system. Should deficiencies be found, a more extensive video inspection with expanded video coverage will be conducted.

5.3 Video inspections will be conducted by the contractor (or their representative) after mainline pavement placement (under the Engineers direction), but before shoulder paving (in the case of new construction). For retrofitted edgedrains, inspections will be conducted before the installation trenches are paved over.

5.4 Outlets, including outlet end treatment installations, must be completely installed prior to conducting video inspections.

6.0 Deficiencies

6.1 Excavation and repair and/or removal and replacement of the deficient portion(s) of edgedrain or edgedrain outlets will be required if the video inspections identify any of the following defects:

6.1.1. Crushed or compressed pipe

6.1.2. Separated Joints

6.1.3. Obstructions within the system which inhibit the passage of the video camera

6.1.4 Structural failure of the pipe wall (a rip or crack)

6.1.5. Sags in the mainline, which allow water to stand more than half the depth of the pipe

6.1.6. Any sags where collection of silt is apparent

6.2 The Contractor's repair method and/or removal and replacement method must meet with the Engineer's prior approval.

7.0 Payment

7.1 All work to correct deficient edgedrain or edgedrain outlets will be the responsibility of the Contractor and performed at the Contractor's expense.

7.2 No claims for extension of time or additional compensation will be allowed for delays due to correcting deficient edgedrains or edgedrain outlets, or for the video inspections to identify same.

7.3 All edgedrains repaired or replaced as a result of video inspection findings shall be reinspected and certified to be functioning properly before final acceptance.

7.4 Payment for the video edgedrain inspections and acceptance should be incorporated under the bid item "edgedrain installation", and considered a prerequisite to payment for acceptable edge drain installations.