John Hunt
AMS West
222-9800 -

ENGINEERING INVESTIGATION

PREPARED FOR

NAVY PUBLIC WORKS CENTER
SAN FRANCISCO BAY

Code 51

TELEVISION INSPECTION

AND

ENGINEERING STUDY OF STORM SEWERS

PHASE II

CR #04-259

AT
ALAMEDA NAVAL AIR STATION
ALAMEDA, CALIFORNIA

CONTRACT NO. N62474-88-D-8400

DECEMBER 1990

A-N WEST, INC.
4123 LAKESIDE DRIVE
RICHMOND, CALIFORNIA 94806

1228

Code 51

TMA/Norcal

ALAMEDA NAVAL AIR STATION
ALAMEDA, CA

ATTENTION: MR. BEN QUIROZ

ON

APRIL 16, 1991

Reference: TMA/Norcal W.O.# N1-04-196

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P.O. Box 4030
Richmond, CA 94804-0040
(415) 235-2633 Fax No. (415) 235-0438

June 4, 1991

Ben Quiroz
Building 114
Naval Air Station
Alameda, CA 94501

RE: TMA/Norcal W.O.# N1-04-196
Storm drain sediment sampling

Dear Mr. Quiroz:

Attached is the final table of results for sediment samples collected on April 16, 1991 from six storm drains located at Naval Air Station, Alameda, CA. TMA/Norcal sampling personnel were Tim Pine and Michelle Pappe. Mr. Andie Anderson was the on-site contact and the escort to the sampling sites.

One sediment sample was collected at each of the following manholes: E-3, N-14, M-4, B-2, L-16, and F-1. Depending on the water level in the storm drain and accessibility of manholes, samples were collected by entering the manhole and scooping material beneath the water level directly into a 16 oz. sample jar or by collecting a sample with a ten foot scoop while standing at ground level. The sample scoop was decontaminated with deionized water and a soap solution as needed between sample locations. The samples were kept refrigerated until analysis was performed.

Silt samples were collected to determine if sediment in the storm drains is contaminated with jet fuel, diesel or heavier oils. Analysis for jet fuel is conducted by a modified EPA Method 8015 and oil and grease by EPA Method SM 5520F by the TMA/Norcal Analytical Laboratory. The modified EPA Method 8015 quantifies total petroleum hydrocarbons as diesel or lighter hydrocarbons and EPA Method SM5520F quantifies all other hydrocarbons heavier than diesel (most likely motor oil).

If you have any questions or if I can be of further assistance, please don't hesitate to call me at (415) 235-2633.

Submitted by:

Tim Pine
Air Quality Field Specialist
Air Source Testing Services

Reviewed by:

Michelle Pappe
Manager, Industrial Hygiene
and Air Source Testing Department

TP/lss

enclosure

TOTAL OIL AND GREASE
GRAVIMETRIC METHOD SM5520D

Client: US NAVY PUBLIC WORKS CENTER
Matrix: SOIL
TMA/Norcal Workorder: N1-04-196

Date Received: 04/16/91
Date Analyzed: 04/17/91

TMA/Norcal ID	Client ID	Results (mg/Kg)	Detection Limit (mg/Kg)
N1-04-196-01A	E-3	6,050	50.0
N1-04-196-02A	N-14	767	50.0
N1-04-196-03A	M-4	153	50.0
N1-04-196-04A	B-2	9,840	50.0
N1-04-196-05A	L-16	1,760	50.0
N1-04-196-06A	F-1	586	50.0
METHOD BLANK	N/A	<50.0	50.0

Assay: STANDARD METHOD SM5520D - TOTAL OIL AND GREASE
Instrument ID: SARTORIUS BALANCE #2

Analyst

Data Release Authorized By

SOIL SAMPLING AT NAVAL AIR STATION
STORM SEWER STUDY

ALAMEDA, CALIFORNIA
APRIL 16, 1991

TMA Sample I.D.	LOCATION	DATE SAMPLED	RESULTS OIL & GREASE (MG/KG)	OIL & GREASE LIMIT (MG/KG)	TOTAL PETROLEUM HYDROCARBONS AS DIESEL (ug/mg)	TOTAL PETROLEUM HYDROCARBONS AS DIESEL LIMIT (ug/g)
N1-04-196-01A	MANHOLE E-3	04/16/91	6,050	50.0	<100	100
N1-04-196-02A	MANHOLE N-14	04/16/91	767	50.0	<100	100
N1-04-196-03A	MANHOLE M-4	04/16/91	153	50.0	43.1	10
N1-04-196-04A	MANHOLE B-2	04/16/91	9,840	50.0	<100	100
N1-05-196-05A	MANHOLE L-16	04/16/91	1,760	50.0	<100	100
N1-05-196-06A	MANHOLE F-1	04/16/91	586	50.0	69.0	100

Note:Five of the six samples analyzed for total petroleum hydrocarbons as diesel contained a heavy oil which resulted in higher detection limits.

TMA

TOTAL PETROLEUM HYDROCARBONS ANALYSIS RESULTS REPORT

Client: US NAVY PUBLIC WORKS CENTER
Matrix: SOIL
TMA/Norcal Workorder: N1-04-196

Date Received: 04/16/91
Date Analyzed: 04/18/91

Client ID	TMA/Norcal ID	Diesel (ug/g)	Detection Limit (ug/g)
E-3	N1-04-196-01A	<100	100
N-14	N1-04-196-02A	<100	100
M-4	N1-04-196-03A	43.1	10.0
B-2	N1-04-196-04A	<100	100
L-16	N1-04-196-05A	<100	100
F-1	N1-04-196-06A	* 69.0	100

Assay: EPA SW846 Modified Method 8015
Total Petroleum Hydrocarbons - Quantitiated as Diesel
Note: Samples contained a heavy oil which resulted in higher detection limits.
* Detected, but below method detection limits

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TABLE OF CONTENTS

PURPOSE

The purpose of this engineering study is to investigate the existing conditions of that portion of the storm sewer system at the Naval Air Station Alameda, Alameda, California, identified as Phase II NAVFAC Drawing No. 6085676, Utility Distribution, Storm Sewer Existing Conditions, dated 7/11/77, henceforth referred to as the plan.

The study inventories the storm sewer mains, laterals, catch basins, manholes and outfalls. This inventory notes the need for cleaning or repair of individual sections of the system; also, recommendations for maintaining and upgrading the system are made.

A television inspection of the storm sewer system was performed wherever possible. The accompanying VHS format video tapes are the result of this television inspection as are the TV Inspection Reports. (Appendix)

Soil Samples were taken from 20 manholes and catch basins within the Phase II storm sewer system. The samples were analyzed to determine what the levels of oil and grease and total petroleum hydrocarbons exist in the sediment and debris in the system. These results are compared to current levels for hazardous waste set by the California Administrative Code, Title 22, to determine how the material should be disposed of. The results of the sediment sampling program are included in Appendix B.

A cost estimate reflecting the recommended cleaning, repairs, and upgrading is presented in Chapter V.

SCOPE OF WORK

This engineering study has been performed under Contract N62474-88-D-8400 between the Navy Public Works Center San Francisco Bay, Oakland, California, and the Richmond, California, office of the firm of A-N West, Inc., Consulting Engineers. The televising of the pipelines was performed by Pacific Pipeline Survey as a subcontractor to A-N West. Sampling and analysis of the contaminants found in the storm drain system was performed by TMA Norcal as a subcontractor to A-N West.The scope of work is outlined as follows:

A. Scope: This contract covers the furnishing of Architectural-Engineering and Engineering Services for:

1. Provide television inspection and engineering investigation with report and cost estimate to accomplish the following:

   The T.V. inspection will be for storm sewer mains and laterals of approximately 54,400 lineal feet of various sizes from 8 inches to 36 inches. This shall include manholes, catch basins, headwalls, tide gate valves, and outfalls. Provide video tapes (VHS format) along with detailed type-written report containing conditions such as: size, type, deterioration, source of infiltration, sags, cave-ins, plugging or other structural deficiencies and location and also the inverts of all laterals at the manholes and cleanouts. Prepare an engineering report with basis of design for the repair/replacement and recommend solution to correct defective areas. Provide cost estimate to reflect the required repair/replacement and removal and disposal of waste material from the pipe of different classification.

STORM SEWER SYSTEM
EXISTING CONDITIONS

The storm water sewer system of the Naval Air Station (NAS) Alameda investigated in Phase II consisted of, according to Navy records, 54,400 linear feet of pipes ranging in size from 8 inch to 36 inch. The lines indicated on the plans as measured by scaling appear to be approximately 40,000 linear feet and range in size from 4 inch to 36 inch. Field investigation confirmed that, in most cases the information on the plan appeared to be correct. Refer to accompanying plates I, II and III. Some pipe sizes differed as did some of the pipe alignments. These cases were encountered where recent work had been performed.

The area at NAS Alameda encompassed in phase II is quite flat, not varying more than 3.5 feet in elevation. The area is generally occupied by industrial, administrative, storage or retail buildings, parking areas, roadways or taxiways. Only a small percentage of the area is covered by vegetation. This greater proportion is covered by asphalt or concrete which indicates that little precipitation which falls on the area is absorbed and most of it becomes runoff. This runoff carries with it into the storm water sewer system the oils, greases, silt and refuse which have accumulated in the area. In addition the proximity of the Bay, low elevation (less than 11.5 feet above Mean Low Water) and flat slopes in the lines causes much of this debris to settle in the lines.

The Public Works Department cleans the catchbasins out annually but this is not done to the laterals or to the mainlines. It is not known whether the mainlines have ever been cleaned since they were constructed. Over time debris has accumulated in some places to the point where they significantly inhibit the passage of storm water. In these places the lines are fouled by grease, oil and silt and a stagnant pool of water. Sampling and testing of these deposits indicates that in many cases they exceed state levels set for hazardous waste.

The storm sewer for the most part appears to have been installed when the base was built, about 50 years ago. During this time, due to earth movements or heavy loads, some portions of the lines have been cracked or broken. These lines are the exceptions and structurally the system is in fair to good condition.

Two of the four storm sewer systems investigated, systems "D" and "E," are connected by a 36-inch RCP near their outfall. A tidal flap gate has been installed on line "E" in a well approximately 100 feet from the outlet. The flap gate is intended to keep high tides from flooding portions of Main Street and Avenue A. It does allow some bay water to come in at high tides due to poor seals, a problem inherent to flap gates. No gates exist on lines "G" and "H" where flooding is not a problem.

SYSTEM DESCRIPTION

The storm sewer system investigated in Phase II consisted of 4 pipe systems. These were given the designations "D," "E," "G," and "H." on the plans.

Manhole and catch basin designations where they existed were used. In cases where they were duplicated or missing, designations were assigned. Refer to accompanying Plates I, II, and III.

The "D" system serves the northwestern sections of the area of study. The entire "D" system is included within the study. The outfall of "D" as indicated as indicated on the plan is no longer correct. The outfall "D" appears to have been abandoned and the "D" system is now rerouted into the "E" system by a 36-inch RCP at manhole 1DA to manhole 1EA. This rerouting of the system appears to have been a recent change judging by the appearance of the manholes. All other manholes on the base were constructed of brick. Manholes 1DA and 1EA are precast concrete boxes.

The tidal flap gate which is located in a well just upstream of outfall "E" has caused a large quantity of debris to accumulate in the pipes. This accumulation extends into the main lines of system "D" in depths of up to 3" as far as manholes 7D and 14D. Other accumulations of debris have been caused by shallow slopes, blocks or sags in the line exist in most of the laterals of system "D." No structural deficiencies requiring repair were observed in the "D" system. Most of the mains and laterals of the system require cleaning. Refer to Appendix A for a Summary of Pipe Reaches.

System "E" serves the northeastern portions of the area of study. Only a portion of system "E" was investigated in Phase II. The remainder was outside the area of the scope of work. Outfall "E" discharges into the Oakland Inner Harbor. A metal grate is attached over the discharge pipe. As noted earlier a flap gate is located in a well near the outfall. Though the flap gate appears to be a recent addition, it no longer forms a tight seal with the headwall.

A large amount of debris has similarly built up in system "E" extending along its entire length. Except for 2 sections of laterals, the entire system "E" had debris and sediment in excess of 3 inches.

A lateral from catch basin 2E-1B to Manhole 2E-1 was badly cracked and broken over most of its length. This appeared to be due to insufficient cover to the pipe. No other structural deficiencies were observed.

System "G" serves the central and southwestern portions of the area of study. Only a portion of system "G" was investigated in Phase II. The remainder was outside the area of the scope of work.

Outfall "G" discharges into the Seaplane Berthing Area. A grating exists at the outfall. Near the outfall the main line and laterals were free of debris and sediment. Further away from the outfall, debris and sediment were found in quantities which warrant cleaning (in excess of 3 inches). Many smaller pipes (12 inches and below) were completely full of sediment. This accumulation appears to have developed due to shallow slopes and little maintenance. The mainline from manhole 1G to manhole 5G has been sliplined with polyethylene pipe. The same procedure has been performed from manholes 2G to 2G2 and manholes 3G to 3G1.

In three cases, some structural deficiencies were observed in the "G" system: reach 3G1 to 3G1A; reach 4G to 4G1; reach 6G16 to 6G19. There are radial cracks in these pipes. Lines leading into manhole 13G have collapsed or broken. It was not possible to determine the extent of this collapse, nor was it possible to televise the reach from either direction due to water in the pipes. When access was tried from both directions into the manhole, obstructions were encountered.

An 18-inch RCP was discovered entering from building 5 into manhole 15G. This pipe is not shown on the plan.

System "H" serves the southeastern portion of the area of study. Only a portion of the system was investigated. The remainder of the system was outside of the area of the scope of work. Outfall "H" discharges into Seaplane Berthing Area. No grating exists at the outfall.

System "H" has the least accumulation of sediment and debris. This appears to be due to steeper slopes (steeper is a relative term, the entire system is nearly horizontal) in the system. Significant accumulations exist in pipes from manhole 6H-3 (previously noted on the plan as 7H, a designation

which is assigned to another manhole. The manhole was redesignated 6H-3 to avoid confusion) to manhole 6H-8 and manhole 6H4 to 6H-6. At manhole 7H1 a 12-inch RCP connected to this pipe does not appear on the plan. In the line located beneath the McDonald's parking area there are large accumulations of what appears to be congealed cooking fat or oil. Between manholes 9G and 10G a 15-foot long "telephone pole" section was found. This pole is wedged in securely and has caused a large quantity of sediment and debris to build up behind it. Between manhole 1H and 2H-1B large chunks of asphalt block the line.

The reach from manhole 6H to 7H contains radial cracks. No other structural deficiencies were found in System "H."

TELEVISION INSPECTION

Television inspection of the storm sewer interiors provided a detailed record of their existing conditions. Levels of accumulated sediment and debris in the pipes can be seen. Also the location and extent of structural deficiencies and sources of infiltration can be determined. Refer to Appendix C for the TV Inspection Report.

To perform this inspection, a video camera was pulled or pushed mechanically through a pipe. The picture from the camera was transmitted by cable to a monitor in a truck where the image is recorded on a VCR. The camera was pushed or pulled by a number of possible methods. Where both ends of a pipe could be accessed, a high pressure hose was attached to the camera and was winched in. Where access to a pipe could be made from only one end, a camera was attached to flexible rods and pushed or rodded through the pipes. This method had the limitation of not being able to negotiate bends or heavy accumulations of debris. A tractor is sometimes fitted onto the camera and it is literally driven into a pipe. This can only be accomplished when no significant debris exists in the pipe. This was not possible at NAS Alameda.

No video picture can be taken when a camera is submerged. The lack of light underwater gives a blocked image. This can be seen in many places on the video tapes. In these cases sediment or debris had created stagnant pockets of water which must be removed before videoing can continue. Removal of debris and water was outside the scope of this project.

In those cases where videotaping was not possible the lines were manually inspected at the manholes or catch basins and the amount of debris or sediment noted. This manual inspection combined with the television inspection gave a full accounting of the existing storm sewer system.

RECOMMENDATIONS

The major problem encountered during this investigation was created by the accumulated debris and sediment in the pipes. This was widespread, covering more than two-thirds of the main lines and laterals. Many of the pipes were more than 50 percent blocked.

It is recommended that where accumulations of debris in excess of one-tenth (0.1) foot exist that the pipe be cleaned and the debris be removed.

The removed debris would exceed levels of hazardous waste set by the California Administrative Code, Title 22.

To avoid the expense of disposing of the material at a Class I landfill site it should be treated. A remote onsite area should be established where biofarming of microbes can be performed to render the material nonhazardous. The resulting material can be then hauled from site and disposed of at a Class III landfill. The cost of cleaning, treating, and disposing of the material in the pipes is estimated to be on the order of $497,000.

To avoid a significant buildup of sediment in the future two recommendations are made. First, the entire storm system should be cleaned at least once in every five years. Cleaning the pipes on a regular basis would avoid blocks in the pipes which cause sediment to build up. The cost of this future cleaning is impossible to estimate at this point. It would be significantly less than the cost required to clean the present pipes. This would be due to the ease of having to remove significantly smaller amounts of material and dispose of them.

Secondly, the storm sewer system should be upgraded with automatic slide gates. The slide gates would form a more reliable means of preventing bay water from entering and depositing sediment in the pipes. They would also act to prevent street flooding due to high tides. The cost of the installation of the automatic slides at Outfalls "E," "G," and "H" is estimated to be on the order of $223,200.

The cost to repair lines that have become cracked or broken is estimated to be approximately $134,600. Reaches from Manhole 2E1 to Catchbasin 2E1B and Manholes 12G to 14G should be removed and replaced with the same diameter pipe as existing. The replacement pipe should be reinforced concrete pipe (RCP). In those cases where the pipes are less than 12 inches in diameter a 12 inch RCP will be used. In those cases where less than 12 inches of cover exists (measured from the top of pipe to the bottom of the rigid pavement or from the top of the flexible pavement or ground surface) the pipe should be laid with a minimum cover of 12 inches. In cases where it is feasible the lines would be replaced at the same line and grade as the existing pipe.

In reaches from Manhole 3G1 to Catchbasin 3G1A, Manhole 4G to Manhole 4G1, Manhole 6G16 to Catchbasin 6G18A and manhole 6H to Manhole 7H, the pipes should be sliplined.

The total cost of cleaning, upgrading, and repairs to the storm sewer system is estimated to be on the order of $883,801.

CLEANING

Cleaning of a pipe generally involves one of two methods.

The first method involves breaking up the sediment of debris with a high pressure jet of water. This material is then drawn to an accessible manhole or catchbasin by the same jet of water. At the catchbasin or manhole the material is vacuumed into a truck which then carries the material to a central location for later transportation or treatment.

In cases where the sediment or debris is too substantial to be broken up and transported by water jet, a bucket us used. In this case, access to a pipe on both the upstream and downstream ends is required. A bucket is pulled into the accumulated sediment from one end usually by a cable and winch. The bucket is then pulled back toward the other end bringing a quantity of sediment with it. This sediment is then again vacuumed up at the manhole by truck.

The larger main lines at Alameda NAS will require the bucket method of cleaning. Most of the laterals could be cleaned by the water jet. Smaller mains or laterals could be cleaned by either method.

An estimated 560 cubic yards of solid material would be have to be removed from the storm sewer system. An additional 400,000 gallons of water would be saturating the removed material or would be generated in the cleaning process. All of the material and water removed from the pipes would require treatment prior to disposal.

DISPOSAL

Soil samples were collected to determine if the sediment in the storm drains is contaminated with jet fuel or other oils. Analysis for jet fuel was conducted by a modified EPA Method 8015 and oil and grease by EPA Method SM5520F by the TMA/Norcal Analytical Laboratory. The modified EPA Method 8015 quantifies total petroleum hydrocarbons as diesel or heavier hydrocarbons and the EPA Method SM5520F quantifies all other hydrocarbons lighter than diesel. Refer to Appendix B for a table of results.

Of the twenty samples taken, twelve samples exceed the limit of 100 MG/KG (PPM) set by the California Administrative Code, Title 22, Social Security, Division 4, Environmental Health Chapter 30, Minimum Standards for Management of Hazardous and Extremely Hazardous Wastes, Article 11, Criteria for Identification of Hazardous and Extremely Hazardous Wastes.

The disposal of waste is determined by California Administrative Code, Title 23, Chapter 3, State Water Resources Control Board, Subchapter 15, Waste Disposal to Land. The designated level shall be based on "The Designated Level Methodology for Waste Classification and Cleanup Level Determination," published by California Regional Water Quality Control Board, Central Valley Region.

If the waste material is identified as hazardous, it shall be managed in accordance with Chapter 30 of Division 4 of Title 22 of California Administrative Code.

According to Subchapter 15, hazardous waste shall be discharged to Class I landfill site.

If the waste material is identified as designated waste, it shall be discharged to Class II landfill site.

If the waste material is determined to be non-hazardous, it shall be discharged to Class III landfill site.

Two options exist for material designated as hazardous. The first requires the waste to be dewatered. The water would be removed by filtering, treated and disposed of on site. The resulting solid waste would then be hauled to and discharged at a Class I landfill site.

The second option also requires the waste to be dewatered. Again the removed water would be treated and disposed of on site. The resulting solid waste in this option would be biologically treated on site rendering it non-hazardous. A one and one-half acre site would be required and 40 square yards of clean material to construct a berm would be required. The solids are then treated biologically by microbes which break down the material with water. The resulting material may then be hauled off site and disposed of in a Class III landfill.

The process of bio-farming requires more time than simply hauling away the material to a Class I landfill. The time involved at Alameda NAS would range from 1 to 2 years depending upon permitting procedures.

Bio-farming is less expensive than non-treatment. The cost of disposing of a Class III landfill is significantly less than disposing of a Class I. Refer to Cost Estimate.

REPAIR

Repair to the storm sewer system of Alameda NAS would require two types of procedures depending upon the nature of the structural deficiency: They are slip lining and pipe replacement.

Sliplining involves the pulling of a polyethylene pipe through a straight section of sewer line to replace the latter. Some of the advantages of sliplining are:

1. The excavation for installation is less than that required for complete pipe replacement.
2. The installed pipe will have very low or no joint leakage since all joints are butt-fusion welded.
3. The smooth inner surface of the polyethylene pipe offers very low resistance to flow and therefore improve the discharge capacity of the pipe.
4. The polyethylene pipe is corrosion-and abrasion-resistant.
5. The pipe is capable of deflection and movement without breaking.

Because of these advantages, the slip-lining technique may be considered under one or more of the following storm sewer conditions:

1. Extensively cracked pipe, especially if the pipe is constructed in unstable soil conditions.
2. Deteriorating pipe having shallow grade.
3. Pipe with massive and destructive root intrusion problems.
4. Pipes in certain locations where the replacement would be very difficult such as under a building.

Sliplining is performed from an access ditch long enough to avoid imposing on the pipe liner a bending radius of less than 35-40 times its outside diameter. The ditch is sloped gradually from the ground surface to the top of the sewer. Its width should be sufficient to allow safe entry of workmen. At the job site the polyethylene pipe sections are connected to the desired length by heat fusion and the pulling head attached to one end. A cable connected to the pulling head pulls the

pipe liner through the sewer pipe. The annular space between the liner and the pipe is usually sufficient to permit normal sewage flow during installation. However, if a high storm water flow is anticipated, storm sewer bypasses should be provided before installation.

The annular space between the end at the liner and the end of the pipe at the manhole is always grouted. Grouting of the annulus between the liner and the pipe is usually not required between manholes if the liner is strong enough to withstand the anticipated loads in the event of collapse of the outer pipe.

Service connections must be joined to the liner once it is in place. This is accomplished by excavating to the pipe at the lateral connection, tapping the slip line pipe and regrouting the lateral into the slip line.

Pipe replacement involves the removal of the existing pipe from the ground and replacing it with a new one or paralleling with a new line and plugging off the old line. The cost of this technique is normally much higher than other rehabilitation techniques and the time requirement is usually much longer. Replacement is normally considered under one or more of the following conditions.

1. In locations where the pipe has lost its structural integrity, such as where it is collapsed, crushed, broken or badly deteriorated.
2. In cases where damage to the existing pipe will continue in spite of other rehabilitation methods due to corrosion, soil movement, increasing traffic load, etc.

Just as for new storm sewer construction, this rehabilitation technique may require the removal of pavement, disruption of traffic, dewatering, shoring, interference with utilities, and repavement. In addition, during the construction period, the storm water flows in the storm sewer sections should also be bypassed.

MAINTENANCE

The maintenance the storm sewer has received has been limited to cleaning out the catchbasins annually. This has allowed the gradual buildup of material in some pipes to the point where they have become blocked or drain very slowly. The effect of accumulated sediment is that it slows the velocity of the storm water which allows more sediment to be deposited, further worsening the problem.

Were the pipes to be cleaned on a regular basis, the problem of blocked or restricted pipes would be avoided. This would eliminate the build up of sediments behind the restriction, thus decreasing the volume of sediment to be removed.

It is difficult to determine exactly how often storm sewer systems should be cleaned. Municipalities in the Bay Area vary in their cleaning schedules. They range from cleaning the system annually to never. Due to the shallow slopes at Alameda NAS and to its proximity to the Bay, a schedule which required cleaning all of the pipes at least once in 5 years would be adequate. Such a cleaning schedule would avoid large accumulations such as presently exist from developing.

A cost estimate for cleaning the system in the future is impossible to develop. It can be assumed to be significantly less than the cost for the present recommended cleaning. This would be due to smaller accumulations of sediment in the pipe.

UPGRADING

The lack of proper gating at the storm sewer outfalls is a major cause of the sediment buildup. Outfalls "G" and "H" have no gates at all. Outfall "E" which serves systems "D" and "E" has a flap gate which has a poor seal which actually contributes to sediment buildup.

An automatic slide gate system would decrease the rate of sediment buildup. A slide gate, unlike a flap gate, would insure a proper seal between the headwall and pipe. This would block bay water from entering into the storm sewer. The sediments suspended in the bay water would then not be able to settle out in the storm sewer pipes. These sediments, along with the sediments and debris carried from the base, are the cause of fouling the storm sewer system at present.

To allow for the passage of storm water the slide gates would be fitted with electrically driven actuators and electronic controls. These would open the gates when a higher pressure is sensed on the upstream side of the slide gates. The gates are closed when the upstream pressure equals or is less than that at the downstream face.

The weight of the slide gate and the power of the driving motor are sufficient to close the gate despite the presence of normal debris which might be stuck in the pipe. The debris is simply crushed or sheared by the slide gate. This would avoid the potential of the gate being jammed open.

The slide gate at Outfall "E" would be accommodated in the present flap gate well. At Outfalls "G" and "H" the manholes just upstream from the outfall would be modified to accommodate the slide gate. The electric actuator and controls would be mounted aboveground. Controls for "G" and "H" could be located at the same point.

Maintenance to the slide gates would be required every 3 months. This would consist of lubricating lifting mechanisms and seats to ensure proper operation. Maintenance to the actuator should be performed every six months. Maintenance to the actuator would consist of lubrication and mechanical adjustments to compensate for accumulated movements due to vibrations.

COST ESTIMATE

The following cost estimate is based on a March 1991 start-up date. The costs were developed from a number of sources including: Contractors' estimates, estimates from similar projects, and Means Site Work Cost Data 1991.

CLEANING

Cleaning storm sewer system	$177,311*
*This assumes water needed for cleaning is provided by Alameda Naval Air Station	
On site filtering and disposal of waste water	96,000
Biotreatment of sediment and disposal at Class III landfill	$141,000
Subtotal	$414,311
Overhead and profit of Prime Contractor (20%)	82,862
TOTAL	$497,173

The cost if the material is not biotreated and is disposed of at a Class I landfill

Cleaning	$177,311
Disposal of Water	96,000
Disposal of Soil	225,000
Subtotal	$498,311
Overhead and profit of Prime Contractor (20%)	99,662
TOTAL	$597,973

COST ESTIMATE (continued)

REPAIRS

The cost of repairing broken or cracked pipes.

Remove and repair 186' of 12" RCP from Manhole 2E1 to Catchbasin 2E1B	$ 10,230
Remove and repair 130' of 27" RCP from Manhole 12G to 14G	9,660
Sliplining 411' of 36" RCP from Manhole 6H to Manhole 7H	95,000
Sliplining 50' of 12" RCP from Manhole 6G16 to Catchbasin 6G18A	4,500
Sliplining 207' of 21" RCP from Manhole 4G to Manhole 4G1	13,500
Sliplining 108' of 12" RCP from Manhole 3G1 to Catchbasin 3G1A	3,300
Subtotal	$136,190
Overhead and profit of Prime Contractor (20%)	27,238
TOTAL	$163,428

COST ESTIMATE (continued)

UPGRADING

Installation of Slidegate at "E"	$ 32,000
Electrical Equipment and Materials	30,000
Shoring and Dewatering	4,000
Subtotal	$ 66,000
Installation of Slidegate at "G"	32,000
Adjustments to Manhole	5,000
Installation of Slidegate at "H"	32,000
Adjustments to Manhole	5,000
Electrical Equipment and Materials for "G" and "H"	30,000
Shoring and Dewatering	6,000
Subtotal	$110,000
Contingencies	10,000
Subtotal	$186,000
Overhead and profit of Prime Contractor (20%)	37,200
TOTAL	$223,200

CHAPTER VI – PLANS

PLATE I – SYSTEMS “D” AND “E”

TELEVISION INSPECTION AND ENGINEERING STUDY OF STORM SEWERS PHASE II

THE ABOVE IDENTIFIED PLATE IS NOT AVAILABLE.

EXTENSIVE RESEARCH WAS PERFORMED BY NAVFAC SOUTHWEST TO LOCATE THIS PLATE. THIS PAGE HAS BEEN INSERTED AS A PLACEHOLDER AND WILL BE REPLACED SHOULD THE MISSING ITEM BE LOCATED.

QUESTIONS MAY BE DIRECTED TO:

DIANE C. SILVA
RECORDS MANAGEMENT SPECIALIST
NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132

TELEPHONE: (619) 532-3676

CHAPTER VI – PLANS

PLATE II – SYSTEM "G"

TELEVISION INSPECTION AND ENGINEERING STUDY OF STORM SEWERS PHASE II

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RECORDS MANAGEMENT SPECIALIST
NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132

TELEPHONE: (619) 532-3676

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ALAMEDA POINT
SSIC NO. 5090.3

CHAPTER VI – PLANS

PLATE III – SYSTEM "M"

TELEVISION INSPECTION AND ENGINEERING STUDY OF STORM SEWERS PHASE II

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RECORDS MANAGEMENT SPECIALIST
NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132

TELEPHONE: (619) 532-3676

APPENDIX A SUMMARY OF PIPE REACHES

TELEVISION INSPECTION AND ENGINEERING
STUDY OF STORM SEWERS
ALAMEDA NAVAL AIR STATION, ALAMEDA, CA
CONTRACT N62474-88-D-8400

A-N WEST, INC.

SUMMARY OF PIPE REACHES

REACH	PIPE INV FROM RIM [IN]	PIPE INV FROM RIM [OUT]	PIPE SIZE AND TYPE	LENGTH	DEPTH OF DEBRIS	MAINTENANCE REQUIRED	COST
OUTFALL "D" – ?	5.0'	–	36" RCP	80'	–	NONE	$0
MH 1EA – MH 1DA	9.0'	10.0'	36" RCP	745'	15"	CLEANING	$21,175
MH 1DA – MH 1D	9.0'	9.7'	36" RCP	102'	15"	CLEANING	$3,630
MH 1D – MH 2D	9.7'	9.0'	36" RCP	225'	15"	CLEANING	$6,325
MH 2D – MH 3D	9.0'	10.3'	36" RCP	233'	12"	CLEANING	$4,950
MH 3D – MH 4D	10.3'	9.5'	30" RCP	235'	12"	CLEANING	$4,400
MH 4D – MH 5D	9.5'	9.0'	30" RCP	239'	9"	CLEANING	$3,630
MH 5D – MH 6D	9.0'	8.3'	27" RCP	285'	9"	CLEANING	$3,930
MH 6D – MH 7D	8.3'	9.0'	27" RCP	266'	6"	CLEANING	$2,310
MH 7D – MH 8D	9.0'	10.1'	24" RCP	252'	3"	CLEANING	$660
MH 8D – MH 9D	10.1'	9.9'	24" RCP	206'	–	NONE	$0
MH 9D – MH 10D	9.9'	9.0'	21" RCP	240'	6"	CLEANING	$1,650
MH 10D – MH 11D	9.0'	8.4'	18" RCP	234'	3"	CLEANING	$660
MH 11D – MH 12D	8.4'	8.8'	18" RCP	168'	6"	CLEANING	$990
MH 12D – MH 12D1	8.8'	4.8'	6" VC	187'	3"	CLEANING	$220
MH 1DA – CB 1DAA	10.0'	3.0'	12" RCP	26'	3"	CLEANING	$40
1D–1DA – CB 1DB	–	2.0'	12" RCP	331'	3"	CLEANING	$530
1D–1DA – CB 1DC	–	3.0'	12" RCP	356'	3"	CLEANING	$560

TELEVISION INSPECTION AND ENGINEERING
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SUMMARY OF PIPE REACHES

REACH	PIPE INV FROM RIM IN]	PIPE INV FROM RIM [OUT]	PIPE SIZE AND TYPE	LENGTH	DEPTH OF DEBRIS	MAINTENANCE REQUIRED	COST
3D-2D - CB 3DB	-	3.0'	12" RCP	58'	3"	CLEANING	$95
MH 3D -CB 3DC	10.3'	3.0'	12" RCP	15'	-	NONE	$0
MH 3D - MH 3DA	10.3'	9.4'	18" RCP	167'	9"	CLEANING	$1,650
MH 3DA - MH 13D	9.4'	9.4'	18" RCP	57'	6"	CLEANING	$330
MH 13D - MH 14D	9.4'	10.5'	18" RCP	226'	3"	CLEANING	$660
MH 13D - CB 13DA	10.5'	3.0'	12" RCP	50'	3"	CLEANING	$80
MH 14D - MH 14D1	10.5'	7.2'	18" RCP	233'	-	NONE	$0
MH 14D - MH 14D2	10.5'	8.8'	18" RCP	267'	3"	CLEANING	$660
MH 14D1 - CB 14D1B	7.2'	5.9'	12" RCP	131'	-	NONE	$0
MH 14D1 -CB 14D1A	7.2'	3.8'	12" RCP	50'	-	NONE	$0
14D1-14D - CB 14DB	-	4.1'	12" RCP	15'	-	NONE	$0
CB 14DA - CB 14DA	4.1'	4.2'	12" RCP	15'	-	NONE	$0
MH 14D2 - CB 14D2B	8.8'	4.4'	12" RCP	15'	3"	CLEANING	$25
CB 14D2B -CB 14D2A	4.4'	4.2'	12" RCP	15'	3"	CLEANING	$25
MH 3D - MH 3D1	10.3'	7.2'	18" RCP	303'	-	NONE	$0
MH 3D1 - CB 3D1C	7.2'	4.2'	12" RCP	31'	-	NONE	$0
CB 3D1C - CB 3D1B	4.2'	4.2'	12" RCP	64'	-	NONE	$0
CB 3D1B - CB3D1A	4.2'	2.0'	12" RCP	207'	3"	CLEANING	$330
3D-4D - CB 3DE	-	3.0'	12" RCP	15'	-	NONE	$0
4D-5D - CB 4DA	-	3.0'	12" RCP	20'	3"	CLEANING	$35

TELEVISION INSPECTION AND ENGINEERING
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A-N WEST, INC.

SUMMARY OF PIPE REACHES

REACH	PIPE INV FROM RIM [IN]	PIPE INV FROM RIM [OUT]	PIPE SIZE AND TYPE	LENGTH	DEPTH OF DEBRIS	MAINTENANCE REQUIRED	COST
MH 5D - CB 5DA	9.0'	4.1'	12" RCP	22'	3"	CLEANING	$35
5D-6D - CB 5DB	-	4.3'	12" RCP	46'	3"	CLEANING	$75
MH 6D - CB 6DA	8.3'	3.9'	12" RCP	33'	3"	CLEANING	$50
CB 7DA - CB 7DB	5.0'	2.0'	8" RCP	30'	3"	CLEANING	$40
7D-8D - CB 7DB	-	5.0'	12" RCP	30'	3"	CLEANING	$50
7D-8D - CB 7DC	-	2.0'	10" RCP	26'	-	NONE	$0
MH 8D - MH 8D1	10.1'	5.5'	15" RCP	326'	6"	CLEANING	$1,980
MH 8D1 - CB 8D1A	5.5'	3.0'	12" RCP	50'	3"	CLEANING	$80
MH 9D - MH 9D1	9.9'	8.9'	18" RCP	324'	3"	CLEANING	$660
MH 9D - CB 9DB	9.9'	3.3'	12" RCP	30'	3"	CLEANING	$50
CB 9DB - CB 9DA	3.3'	3.3'	6" VC	15'	3"	CLEANING	$25
MH 9D1 - CB 9D1A	4.5'	4.9'	12" RCP	30'	3"	CLEANING	$50
MH 10D - CB 10DB	9.0'	4.3'	12" RCP	15'	3"	CLEANING	$25
CB 10DB - CB 10DA	4.3'	3.6'	12" RCP	30'	3"	CLEANING	$50
MH 11D - CB 11DB	8.4'	3.5'	12" RCP	190'	3"	CLEANING	$330
11D-12D - MH 11D1	-	4.5'	6" VC	470'	3"	CLEANING	$660
CB 11DB - CB 11DA	3.5'	3.0'	12" RCP	160'	3"	CLEANING	$250
12D-11D - CB 12DB	-	4.0'	12" RCP	15'	3"	CLEANING	$25
CB 12DB - CB 12DA	4.0'	3.9'	12" RCP	15'	3"	CLEANING	$25

TELEVISION INSPECTION AND ENGINEERING
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SUMMARY OF PIPE REACHES

REACH	PIPE INV FROM RIM [IN]	PIPE INV FROM RIM [OUT]	PIPE SIZE AND TYPE	LENGTH	DEPTH OF DEBRIS	MAINTENANCE REQUIRED	COST
OUTFALL"E"-MH1EA	6.8'	15.0'	36" RCP	110'	-	NONE	$0
MH 1EA - MH 1E	15.0'	8.0'	36" RCP	200'	15"	CLEANING	$5,775
MH 1E - MH 2E	8.0'	9.0'	30" RCP	400'	12"	CLEANING	$7,425
MH 2E - MH 3E	9.0'	8.5'	30" RCP	228'	9"	CLEANING	$3,300
MH 3E - MH 4E	8.5'	10.0'	30" RCP	210'	15"	CLEANING	$5,225
MH 4E - MH 5E	10.0'	9.7'	24" RCP	280'	12"	CLEANING	$4,400
MH 5E - MH 6E	9.7'	11.5'	24" RCP	276'	9"	CLEANING	$3,630
MH 6E - MH 7E	11.5'	6.5'	12" RCP	182'	3"	CLEANING	$290
MH 1EA - CB 1EAA	4.0'	3.0'	12" RCP	15'	3"	CLEANING	$25
1EA-1E - CB 1EAB	-	3.0'	12" RCP	23'	3"	CLEANING	$40
1E-2E - CB 1EA	-	2.6'	12" RCP	72'	3"	CLEANING	$120
1E-2E - CB 1EB	-	2.6'	12" RCP	82'	3"	CLEANING	$120
MH 2E - MH 2E1	8.0'	7.3'	18" RCP	250'	3"	CLEANING	$660
MH 2E - CB 2EA	8.0'	3.0'	12" RCP	58'	3"	CLEANING	$95
2E-2E1 - CB 2EB	-	3.0'	12" RCP	8'	3"	CLEANING	$25
MH 2E1 - CB 2E1B	7.3'	2.8'	12" RCP	186'	-	REPAIR A	$10,230
CB 2E1B - CB 2E1A	2.8'	2.3'	12" RCP	99'	-	NONE	$0
MH 3E - CB 3EA	8.5'	3.0'	12" RCP	27'	3"	CLEANING	$45

TELEVISION INSPECTION AND ENGINEERING
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A-N WEST, INC.

SUMMARY OF PIPE REACHES

REACH	PIPE INV FROM RIM [IN]	PIPE INV FROM RIM [OUT]	PIPE SIZE AND TYPE	LENGTH	DEPTH OF DEBRIS	MAINTENANCE REQUIRED	COST
MH 4E - MH 4E1	10.0'	5.5'	18" RCP	236'	6"	CLEANING	$1,650
MH 4E - CB 4EA	10.0'	4.5'	12" RCP	64'	3"	CLEANING	$100
MH 4E1 - CB 4E1D	5.5'	5.3'	10" RCP	18.5'	-	NONE	$0
CB 4E1D - CB 4E1C	5.3'	4.5'	10" RCP	17.5'	-	NONE	$0
CB 4E1C - CB 4E1B	4.5'	4.5'	10" RCP	23.5'	-	NONE	$0
CB 4E1B - CB 4E1A	4.5'	4.5'	8" RCP	17.5'	-	NONE	$0
4E-5E - MH 4E5	-	3.0'	8" VC	230'	3"	CLEANING	$330
4E-5E - MH 4E6	-	4.0'	8" VC	340'	3"	CLEANING	$460
5E-6E - CB 5EA	-	3.0'	12" RCP	50'	3"	CLEANING	$85
MH 6E - MH 6E1	11.5'	10.5'	18" RCP	235'	6"	CLEANING	$1,650
MH 6E1 - CB 6E1A	10.5'	4.1'	10" RCP	77'	3"	CLEANING	$130
MH 6E1 - CB 6E1C	10.5'	4.0'	12" RCP	45'	3"	CLEANING	$75
CB 6E1C - CB 6E1B	4.0'	4.0'	12" RCP	18'	3"	CLEANING	$30
6E-7E - CB 6EA	-	4.6'	12" RCP	8'	3"	CLEANING	$25
CB 6EA - CB 6EB	4.6'	3.1'	12" RCP	60'	3"	CLEANING	$85

TELEVISION INSPECTION AND ENGINEERING
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SUMMARY OF PIPE REACHES

REACH	PIPE INV FROM RIM [IN]	PIPE INV FROM RIM [OUT]	PIPE SIZE AND TYPE	LENGTH	DEPTH OF DEBRIS	MAINTENANCE REQUIRED	COST
OUTFALL"G"-MH 1G	11.0'	10.7'	36" RCP	50'	-	NONE	$0
MH 1G - MH 2G	10.7'	9.5'	30" PEL	282'	-	NONE	$0
MH 2G - MH 3G	9.5'	9.2'	30" PEL	276'	-	NONE	$0
MH 3G - MH 4G	9.2'	9.1'	30" PEL	280'	3"	CLEANING	$990
MH 4G - MH 5G	9.1'	9.5'	30" PEL	408'	3"	CLEANING	$1,320
MH 5G - MH 6G	9.9'	9.9'	30" RCP	318'	9"	CLEANING	$4,125
MH 6G - MH 7G	9.9'	11.6'	24" RCP	347'	12"	CLEANING	$5,500
MH 7G - MH 8G	11.6'	10.6'	24" RCP	230'	9"	CLEANING	$2,970
MH 8G - MH 9G	10.4'	10.0'	21" RCP	310'	9"	CLEANING	$3,630
MH 9G - MH 10G	10.0'	9.7'	18" RCP	362'	3"	CLEANING	$990
MH 10G - MH 11G	9.7'	8.5'	18" RCP	310'	3"	CLEANING	$660
MH 11G - MH 12G	8.5'	9.5'	15" RCP	415'	12"	CLEANING	$4,400
MH 12G - MH 13G	9.5'	10.6'	27" RCP	50'	-	REPAIR A	$3,720
MH 13G - MH 14G	10.6'	8.0'	27" RCP	80'	-	REPAIR A	$5,940
MH 14G - MH 15G	8.0'	7.7'	27" RCP	260'	9"	CLEANING	$3,630
1G -2G - CB1GA	-	3.0'	12" RCP	30'	-	NONE	$0
MH 2G - CB 2GA	4.0'	3.0'	12" RCP	15'	-	NONE	$0
MH 2G - MH 2G1	7.1'	5.2'	12" PEL	231'	-	NONE	$0
MH 2G1 - MH 2G2	5.2'	3.5'	8" PEL	294'	-	NONE	$0

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2G1-2G2 - CB 2G1A	-	3.0'	8" VC	15'	-	NONE	$0
MH 2G2 - CB 2G2A	-	3.0'	8" VC	60'	-	NONE	$0
MH 3G - MH 3G1	7.1'	6.7'	18" RCP	475'	-	NONE	$0
3G-3G1 - CB 3G1B	-	2.0'	10" RCP	50'	3"	CLEANING	$100
CB 3G1B - CB 3G1A	2.0'	2.0'	8" RCP	160'	6"	CLEANING	$560
CB 3GC - CB 3GD	3.5'	2.0'	8" RCP	15'	-	NONE	$0
3G-3G1 - CB 3GE	-	3.0'	8" RCP	15'	-	NONE	$0
MH 3G1 - CB 3G1A	6.7'	4.3'	12" RCP	108'	-	REPAIR B	$3,300
MH 3G1 - CB 3G1B	6.7'	3.0'	8" RCP	153'	3"	CLEANING	$210
MH 3G1 - BLDG 112	6.7'	-	12" RCP	730'	9"	CLEANING	$5,256
MH 3G1 - CB 3G1C	6.7'	3.3'	8" VC	33'	3"	CLEANING	$50
MH 4G - CB 4GA	7.5'	3.5'	12" RCP	15'	3"	CLEANING	$25
MH 4G - MH 4G1	9.3'	8.3'	21" RCP	207'	-	REPAIR B	$13,500
MH 4G1 - CB 4G1A	7.4'	3.0'	8" RCP	150'	3"	CLEANING	$200
MH 4G1 - MH 4G2	8.3'	7.9'	21" RCP	274'	6"	CLEANING	$1,980
MH 4G2 - MH 4G3	7.9'	8.0'	18" RCP	323'	3"	CLEANING	$660
MH 4G2 - CB 4G2A	7.9'	3.0'	8" RCP	20'	-	NONE	$0
MH 4G3 - MH 4G4	8.0'	7.4'	18" RCP	273'	3"	CLEANING	$660
MH 4G4 - MH 4G5	7.4'	6.8'	15" RCP	329'	-	NONE	$0
MH 4G5 - MH 4G6	6.8'	4.7'	15" RCP	276'	-	NONE	$0
MH 5G - CB 5GB	9.9'	5.0'	12" RCP	70'	3"	CLEANING	$120

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SUMMARY OF PIPE REACHES

REACH	PIPE INV FROM RIM [IN]	PIPE INV FROM RIM [OUT]	PIPE SIZE AND TYPE	LENGTH	DEPTH OF DEBRIS	MAINTENANCE REQUIRED	COST
MH 5G - MH 5G1	9.9'	8.3'	27" RCP	210'	3"	CLEANING	$660
CB 5GA - CB 5GB	5.0'	6.0'	12" RCP	130'	3"	CLEANING	$220
MH 5G1 - MH 5G2	8.3'	7.8'	24" RCP	275'	3"	CLEANING	$660
MH 5G2 - MH 5G3A	7.8'	6.1'	21" RCP	210'	3"	CLEANING	$660
5G2-5G3 - CB 5G2C	-	4.0'	12" RCP	24'	3"	CLEANING	$40
CB 5G2B - CB 5G2A	4.9'	4.5'	12' RCP	35'	3"	CLEANING	$95
MH 5G3A - MH 5G3	6.1'	6.7'	21" RCP	90'	3"	CLEANING	$330
CB 5G3AA-CB 5G3AB	2.0'	2.0'	8" VC	40'	-	NONE	$0
MH 5G3A - CB 5G3A	4.0'	2.0'	8" VC	170'	3"	CLEANING	$230
MH 5G3 - MH 5G4	6.7'	6.5'	21" RCP	300'	3"	CLEANING	$660
MH 5G4 - MH 5G5	6.5'	6.8'	18" RCP	239'	12"	CLEANING	$3,630
5G4-5G5 - CB 5G5E	-	3.0'	12" RCP	35'	3"	CLEANING	$60
CB 5G5E - CB 5G5D	3.0'	3.3'	12" RCP	54'	3"	CLEANING	$85
CB 5G5D - CB 5G5C	3.3'	3.7'	12" RCP	36'	3"	CLEANING	$60
CB 5G5C - CB 5G5B	3.7'	3.5'	12" RCP	36'	3"	CLEANING	$60
5G4-5G5 - CB 5GA	-	4.0'	8" RCP	142'	3"	CLEANING	$60
MH 5G5 - MH 5G6	6.8'	5.5'	15" RCP	314'	6"	CLEANING	$190
MH 5G6 - CB 5G6A	5.5'	3.0'	12" RCP	36'	6"	CLEANING	$1,650
5G-6G - CB 5GC	-	5.0'	12" RCP	27'	3"	CLEANING	$45
5G-6G - CB 5GD	-	4.5'	12" RCP	36'	3"	CLEANING	$60

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REACH	PIPE INV FROM RIM [IN]	PIPE INV FROM RIM [OUT]	PIPE SIZE AND TYPE	LENGTH	DEPTH OF DEBRIS	MAINTENANCE REQUIRED	COST
5G-6G - CB 5GE	-	4.0'	12" RCP	30'	3"	CLEANING	$45
5G-6G - CB 5GF	-	2.5'	12" RCP	26'	3"	CLEANING	$40
5G-6G - CB 5GG	-	2.0'	8" RCP	27'	3"	CLEANING	$40
5G-6G - CB 5GH	-	5.2'	12" RCP	15'	3"	CLEANING	$25
MH 6G - MH 6G1	9.9'	9.5'	18" RCP	214'	-	NONE	$0
MH 6G - MH 6G16	9.9'	11.0'	24" RCP	230'	6"	CLEANING	$1,650
MH 6G16 - MH 6G17	11.0'	10.0'	21" RCP	310'	6"	CLEANING	$2,310
MH 6G16 - CB 6G16A	11.0'	4.0'	12" RCP	50'	-	REPAIR B	$4,500
MH 6G17 - MH 6G18	10.0'	8.5'	21" RCP	300'	9"	CLEANING	$3,680
MH 6G17 - CB 6G17A	10.0'	8.5'	21" RCP	50'	3"	CLEANING	$330
MH 6G18 - MH 6G19	8.5'	7.1'	15" RCP	300'	9"	CLEANING	$4,620
MH 6G18 - CB 6G18A	8.5'	4.0'	12" RCP	50'	3"	CLEANING	$85
MH 6G19 - MH 6G20	7.1'	7.1'	15" RCP	40'	6"	CLEANING	$330
MH 6G20 - MH 6G21	7.1'	7.1'	15" RCP	30'	6"	CLEANING	$330
MH 6G20 - CB 6G20B	7.1'	6.5'	15" RCP	108'	6"	CLEANING	$660
CB 6G20B -CB 6G20A	6.5'	5.5'	12" RCP	400'	6"	CLEANING	$1,920
6G-7G - CB 6GC	-	4.5'	12" RCP	7'	3"	CLEANING	$25
CB 6GC - CB 6GB	4.5'	3.0'	12" RCP	16'	3"	CLEANING	$25
MH 8GD - CB 8GA	4.5'	3.0'	12" RCP	10'	3"	CLEANING	$25

TELEVISION INSPECTION AND ENGINEERING
STUDY OF STORM SEWERS
ALAMEDA NAVAL AIR STATION, ALAMEDA, CA
CONTRACT N62474-88-D-8400

A-N WEST, INC.

SUMMARY OF PIPE REACHES

REACH	PIPE INV FROM RIM [IN]	PIPE INV FROM RIM [OUT]	PIPE SIZE AND TYPE	LENGTH	DEPTH OF DEBRIS	MAINTENANCE REQUIRED	COST
CB 8GA - CB 8GB	3.0'	4.5'	12" RCP	16'	3"	CLEANING	$25
CB 8GB - CB 8GC	4.5'	3.0'	12" RCP	10'	3"	CLEANING	$25
9G-10G - CB9GB	-	3.0'	12" RCP	10'	3"	CLEANING	$25
CB 9GB - CB 9GA	3.0'	3.0'	10" RCP	18'	3"	CLEANING	$30
10G-11G - CB 10GD	-	4.5'	12" RCP	10'	3"	CLEANING	$25
CB 10GD - CB 10GC	4.5'	4.0'	12" RCP	29'	3"	CLEANING	$50
CB 10GC - CB 10GA	4.0'	3.2'	10" CMP	100'	3"	CLEANING	$165
CB 10GB - CB 10GA	3.2'	4.0'	10" CMP	20'	3"	CLEANING	$30
11G-12G - CB 11GA	-	4.0'	12" RCP	30'	3"	CLEANING	$50
MH 12G - CB 12GA	9.5'	3.5'	8" RCP	52'	3"	CLEANING	$75
MH 14G - CB 14GA	8.0'	4.5'	12" RCP	98'	-	NONE	$0
MH14G - CB 14GB	8.0'	3.0'	12" RCP	89'	3"	CLEANING	$140

TELEVISION INSPECTION AND ENGINEERING
STUDY OF STORM SEWERS
ALAMEDA NAVAL AIR STATION, ALAMEDA, CA
CONTRACT N62474-88-D-8400

A-N WEST, INC.

SUMMARY OF PIPE REACHES

REACH	PIPE INV FROM RIM [IN]	PIPE INV FROM RIM [OUT]	PIPE SIZE AND TYPE	LENGTH	DEPTH OF DEBRIS	MAINTENANCE REQUIRED	COST
OUTFALL"H"-MH 1H	11.0'	10.6'	36" RCP	120'	-	NONE	$0
MH 1H - MH 3H	10.6'	12.3'	36" RCP	153'	-	NONE	$0
MH 3H - MH 4H	12.3'	13.5'	36" RCP	342'	-	NONE	$0
MH 4H - MH 5H	13.5'	13.1'	36" RCP	93'	-	NONE	$0
MH 5H - MH 6H	13.1'	12.6'	36" RCP	215'	-	NONE	$0
MH 6H - MH 7H	12.6'	10.5'	36" RCP	411'	-	REPAIR B	$95,000
MH 7H - MH 8H	10.5'	9.2'	36" RCP	401'	-	NONE	$0
MH 8H - MH 9H	9.2'	8.4'	36" RCP	307'	-	NONE	$0
MH 9H - MH 10H	8.4'	8.0'	36" RCP	25'	15"	CLEANING	$990
MH 1H - MH 2H	10.6'	6.5'	12" VC	180'	3"	CLEANING	$280
MH 1H - CB 1HA	10.6'	3.0'	12" RCP	15'	3"	CLEANING	$25
MH 2H - CB 2H1	6.5'	3.2'	8" VC	100'	3"	CLEANING	$140
3H-4H - CB 3HA	-	3.2'	12" RCP	20'	-	NONE	$0
MH 6H - MH 6H1	12.6'	10.7'	24" VC	212'	-	NONE	$0
6H-7H - CB 6HC	-	3.8'	8" VC	8'	-	NONE	$0
MH 6H1 - MH 6H2	10.7'	11.0'	21" VC	152'	-	NONE	$0
MH 6H2 -MH 6H3	11.0'	9.8'	21" VC	235'	-	NONE	$0
MH 6H2 - CB 6H2C	5.0'	3.5'	12" RCP	40'	3"	CLEANING	$65
CB 6H2C - CB 6H2B	3.5'	3.5'	8" RCP	44'	3"	CLEANING	$65
CB 6H2B - CB 6H2A	3.5'	3.0'	8" VC	60'	3"	CLEANING	$85
CB 6HC - CB 6HB	3.8'	3.6'	8" VC	18.5'	-	NONE	$0

TELEVISION INSPECTION AND ENGINEERING
STUDY OF STORM SEWERS
ALAMEDA NAVAL AIR STATION, ALAMEDA, CA
CONTRACT N62474-88-D-8400

A-N WEST, INC.

SUMMARY OF PIPE REACHES

REACH	PIPE INV FROM RIM [IN]	PIPE INV FROM RIM [OUT]	PIPE SIZE AND TYPE	LENGTH	DEPTH OF DEBRIS	MAINTENANCE REQUIRED	COST
CB 6HB - CB 6HA	3.6'	1.5'	8" VC	40'	-	NONE	$0
MH 6H3 - CB 7H1A	9.8'	7.7'	15" ACP	220'	6"	CLEANING	$1,320
CB 7H1A - CB 7H1	7.7'	7.5'	15" ACP	20'	6"	CLEANING	$330
CB 7H1 - CB 7H2	7.5'	4.3'	12" ACP	283'	3"	CLEANING	$450
MH 6H3 - MH 6H3A	9.8'	9.5'	21" VC	46'	6"	CLEANING	$330
6H3-6H3A - CB6H3A	-	3.0'	12" RCP	30'	3"	CLEANING	$50
MH 6H3A - MH 6H4	9.5'	9.5'	21" VC	281'	9"	CLEANING	$3,300
MH 6H4 - MH 6H8	9.5'	9.2'	21" VC	347'	3"	CLEANING	$990
MH 6H4 - CB 6H4A	9.5'	6.0'	6" CI	50'	-	NONE	$0
MH 6H4 - CB 6H4B	9.5'	6.0'	12" RCP	50'	-	NONE	$0
MH 6H4 - MH 6H5	9.5'	10.5'	15" RCP	258'	3"	CLEANING	$660
MH 6H5 - MH 6H6	10.5'	9.8'	15" RCP	305'	3"	CLEANING	$660
MH 6H5 - CB 6H5A	10.5'	3.0'	12" RCP	50'	3"	CLEANING	$85
MH 6H6 - MH 6H7	9.8'	8.7'	15" RCP	303'	3"	CLEANING	$660
MH 6H7 - CB 6H7A	8.7'	5.5'	12" RCP	15'	3"	CLEANING	$25
MH 7H - CB 7HB	10.5'	4.0'	10" CMP	25'	3"	CLEANING	$45
CB 7HB - CB 7HA	4.0'	3.6'	10" CMP	25'	3"	CLEANING	$45
7H-8H - CB 7HC	-	3.0'	12" RCP	5.0'	3"	CLEANING	$25
TANK - CB 8HA	-	2.0'	12' RCP	10'	6"	CLEANING	$50
8H-9H - CB 8HA	-	2.0'	8" CMP	300'	3"	CLEANING	$410

TELEVISION INSPECTION AND ENGINEERING
STUDY OF STORM SEWERS
ALAMEDA NAVAL AIR STATION, ALAMEDA, CA
CONTRACT N62474-88-D-8400

A-N WEST, INC.

SUMMARY OF PIPE REACHES

REACH	PIPE INV FROM RIM (IN)	PIPE INV FROM RIM (OUT)	PIPE SIZE AND TYPE	LENGTH	DEPTH OF DEBRIS	MAINTENANCE REQUIRED	COST
MH 6H13 - MH 6H14	7.5'	6.0'	15" RCP	271'	6"	CLEANING	$1,650
MH 6H14 - CB 6H14B	6.0'	3.0'	12" RCP	30'	6"	CLEANING	$150
CB 6H14B - CB 6H14A	3.0'	1.0'	8" RCP	100'	3"	CLEANING	$150

NOTES:

REPAIR A = REMOVE AND REPLACE PIPE
REPAIR B = SLIPLINE PIPE
INV = INVERT
RCP = REINFORCED CONCRETE PIPE
CMP = CORRUGATED METAL PIPE
VC = VITRIFIED CLAY PIPE
PEL = POLYETHYLENE LINED PIPE
CI = CAST IRON PIPE
MH = MANHOLE
CB = CATCHBASIN
6H-7H = LATERAL ENTERS A PIPE DIRECTLY NOT AT A STRUCTURE

APPENDIX B SEDIMENT SAMPLE RESULTS

SOIL SAMPLING AT NAVAL AIR STATION

STORM SEWER STUDY

ALAMEDA, CALIFORNIA
OCTOBER 12, 23 & NOVEMBER 2, 9, 16, 1990

TMA Sample I.D.	LOCATION	DATE SAMPLED	RESULTS		TOTAL PETROLEUM HYDROCARBONS AS DIESEL LIMIT
			OIL & GREASE (MG/KG)	TOTAL PETROLEUM HYDROCARBONS (MG/KG)	
10-259-01A	MANHOLE 15G	10/12/90	12,000	120	100
10-259-02A	MANHOLE 5G4	10/12/90	970	<50	100
10-259-03A	MANHOLE 4G5	10/12/90	14,000	--	100
11-118-04A	MANHOLE 4G5	11/09/90	--	160	100
10-372-01A	MANHOLE 3E1	10/23/90	5,220	<50	100
10-372-02A	MANHOLE 5G	10/23/90	3,300	241	100
10-372-03A	MANHOLE 2E1	10/23/90	3,000	<50	100
10-372-04A	MANHOLE 11D	10/23/90	3,500	1,040	100
11-043-01A	MANHOLE 7D	11/02/90	2,810	183	100
11-043-02A	MANHOLE 6H4	11/02/90	5,530	369	100
11-043-03A	MANHOLE H8	11/02/90	9,750	4,395	100
11-043-04A	MANHOLE 5E	11/02/90	3,120	41.3	100
11-118-01A	MANHOLE 1H	11/09/90	22,900	0.95	100
11-118-02A	MANHOLE 6G20	11/09/90	1,590	220	100
11-118-03A	MANHOLE OUTFALL "E"	11/09/90	4,960	210	100
11-118-05A	MANHOLE 2G	11/09/90	7,120	490	100
11-199-01A	MANHOLE 6H2B	11/16/90	2,760	1,430	100
11-199-02A	MANHOLE 7G	11/16/90	1,480	<10	100
11-199-03A	MANHOLE 361A	11/16/90	2,000	592	100
11-199-04A	MANHOLE 8D1	11/16/90	3,200	44.2	100
11-199-05A	MANHOLE 2D	11/16/90	1,300	<10	100

Note: A less than (<) value reflects the analytical limit of detection.

Laboratory Results

ANALYSIS RESULTS REPORT
TOTAL PETROLEUM HYDROCARBONS

Client: A-N WEST
Matrix: SOIL
TMA/Norcal Workorder #: NO-10-259

Date Received: 10/12/90
Date Extracted: 10/26/90
Date Analyzed: 11/03/90

CLIENT ID	TMA/Norcal ID	DIESEL (MG/KG)	DETECTION LIMIT (MG/KG)
MANHOLE 15G	NO-10-259-01A	120	50
MANHOLE 5G4	NO-10-259-02A	<50	50

Assay: EPA SW846 MODIFIED METHOD 8015
TOTAL PETROLEUM HYDROCARBONS QUANTITATED AS DIESEL

Analyst

Data Release Authorized By

TOTAL PETROLEUM HYDROCARBONS
GRAVIMETRIC METHOD SM5520F

Client: AN WEST
Matrix: SOIL
TMA/Norcal Workorder: NO-10-259

Date Received: 10/11/90
Date Analyzed: 11/06/90

TMA/Norcal ID	Client ID	Results (mg/KG)	Detection Limit (mg/KG)
NO-10-259-01A	MANHOLE 15G	12,000	50
NO-10-259-02A	MANHOLE 54G	970	50

Analyst

Date Release Authorized By

TOTAL PETROLEUM HYDROCARBONS
GRAVIMETRIC METHOD SM5520F

Lab Name: TMA/Norcal
Client: A-N WEST
Matrix: SOIL

Date Received: 10-12-90
Date Analyzed: 10-26-90

TMA/Norcal ID	Client ID	Results (mg/KG)	Detection Limit (mg/KG)
N0-10-259-03A	MANHOLE 4G5	14,400	50

Analyst

Data Release Authorized By

ANALYSIS RESULTS REPORT
TOTAL PETROLEUM HYDROCARBONS

Client: A-N WEST
Matrix: SOIL
TMA/Norcal Workorder #: NO-10-372

Date Received: 10/23/90
Date Extracted: 10/26/90
Date Analyzed: 11/03/90

CLIENT ID	TMA/Norcal ID	DIESEL (MG/KG)	DETECTION LIMIT (MG/KG)
MANHOLE 3E1	10-372-01A	<50	50
MANHOLE 5G	10-372-02A	241	50
MANHOLE 2E1	10-372-03A	<50	50
MANHOLE 11D	10-372-04A	1,040	50

Assay: EPA SW846 MODIFIED METHOD 8015
TOTAL PETROLEUM HYDROCARBONS QUANTITATED AS DIESEL

Analyst

Data Release Authorized By

TOTAL PETROLEUM HYDROCARBONS
GRAVIMETRIC METHOD SM5520F

Lab Name: TMA/Norcal
Client: A-N WEST
Matrix: SOIL

Date Received: 10-23-90
Date Analyzed: 10-26-90

TMA/Norcal ID	Client ID	Results (mg/KG)	Detection Limit (mg/KG)
NO-10-372-01A	MANHOLE 3E1	5,220	50
NO-10-372-02A	MANHOLE 5G	3,300	50
NO-10-372-03A	MANHOLE 2E1	3,000	50
NO-10-372-04A	MANHOLE 11D	3,500	50

Analyst

Data Release Authorized By

DIESEL
ANALYSIS RESULTS REPORT

Lab Name: TMA/Norcal
Client: A-N WEST
Matrix: Soil

Date Received: 11-02-90
Date Analyzed: 11-16-90

Analysis/Method: MODIFIED - 8015

TMA/Norcal ID	Client ID	DIESEL (mg/kg)	Detection Limit (mg/kg)
NO-11-043-1A	MANHOLE 7D	183	10
NO-11-043-2A	MANHOLE 6H4	369	10
NO-11-043-3A	MANHOLE H8	4395	10
NO-11-043-4A	MANHOLE 5E	41.3	10

Analyst

Data Release Authorized By

TOTAL PETROLEUM HYDROCARBONS
GRAVIMETRIC METHOD SM5520F

Lab Name: TMA/Norcal
Client: A-N WEST
MATRIX: SOIL

Date Received: 11/02/90
Date Analyzed: 11/15/90

TMA/Norcal ID	Client ID	Results (mg/kg)	Detection Limit (mg/kg)
NO-11-043-1A	01A	2810	50
NO-11-043-2A	02A	5530	50
NO-11-043-3A	03A	9750	50
NO-11-043-4A	04A	3120	50

Analyst

Data Release Authorized By

TOTAL PETROLEUM HYDROCARBONS
GRAVIMETRIC METHOD SM5520F

Client: A-N WEST
Matrix: SLUDGE
TMA/Norcal Workorder: NO-11-118

Date Received: 11/09/90
Date Analyzed: 11/15/90

TMA/Norcal ID	Client ID	Results mg/Kg	Detection Limit mg/Kg
NO-11-118-01A	MANHOLE IH	22,900	50
NO-11-118-02A	MANHOLE 6G20	1,590	50
NO-11-118-03A	MANHOLE OUTFALL "E"	4,960	50
NO-11-118-05A	MANHOLE 2G	7,120	50

Zarvin Alam for Becky Kubin.
Analyst

Data Release Authorized By

TOTAL PETROLEUM HYDROCARBONS
GRAVIMETRIC METHOD SM5520F

Client: AN WEST
Matrix: SOIL
TMA/Norcal Workorder: NO-11-199

Date Received: 11/16/90
Date Analyzed: 11/26/90

TMA/Norcal ID	Client ID	Results (mg/KG)	Detection Limit (mg/KG)
NO-11-199-01A	MANHOLE 6H2B	2,760	50
NO-11-199-02A	MANHOLE 7G	1,480	50
NO-11-199-03A	MANHOLE 3G1A	2,000	50
NO-11-199-04A	MANHOLE 8D1	3,200	50
NO-11-199-05A	MANHOLE 2D	1,300	50

Analyst

Data Release Authorized By

Client: AN WEST
Matrix: SOIL
TMA/Norcal Workorder: NO-11-199

Date Received: 11/16/90
Date Analyzed: 11/26/90

TMA/Norcal ID	Client ID	Results (mg/KG)	Detection Limit (mg/KG)
NO-11-199-01A	MANHOLE 6H2B	2,760	50
NO-11-199-02A	MANHOLE 7G	1,480	50
NO-11-199-03A	MANHOLE 3G1A	2,000	50
NO-11-199-04A	MANHOLE 8D1	3,200	50
NO-11-199-05A	MANHOLE 2D	1,300	50

Analyst

Data Release Authorized By

ANALYSIS RESULTS REPORT
TOTAL PETROLEUM HYDROCARBONS

Client: A-N WEST
Matrix: SLUDGE
TMA/Norcal Workorder #: NO-11-199

Date Received: 11/16/90
Date Analyzed: 11/28/90

CLIENT ID	TMA/Norcal ID	DIESEL (MG/KG)	DETECTION LIMIT (MG/KG)
MANHOLE 6H2B	NO-11-199-1A	1430	10
MANHOLE 7G	NO-11-199-2A	<10	10
MANHOLE 3G1A	NO-11-199-3A	592	10
MANHOLE 8D1	NO-11-199-4A	44.2	10
MANHOLE 2D	NO-11-199-5A	<10	10

Assay: EPA SW846 MODIFIED METHOD 8015
TOTAL PETROLEUM HYDROCARBONS QUANTITATED AS DIESEL

Analyst

Data Release Authorized By

APPENDIX C TV INSPECTION REPORT

RECEIVED
OCT 23 1990
AN WEST, INC.

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A. N. WEST

DATE: OCTOBER 9, 1990 RUN NO: 1

PIPE SIZE: 27" PIPE TYPE: R.C.

JOINT LENGTH: 3' APPROX MH DEPTH: .

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #15-6
TO MANHOLE #14-6

OPERATOR: ROB MAGOWAN

TOTAL RUN: 260.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

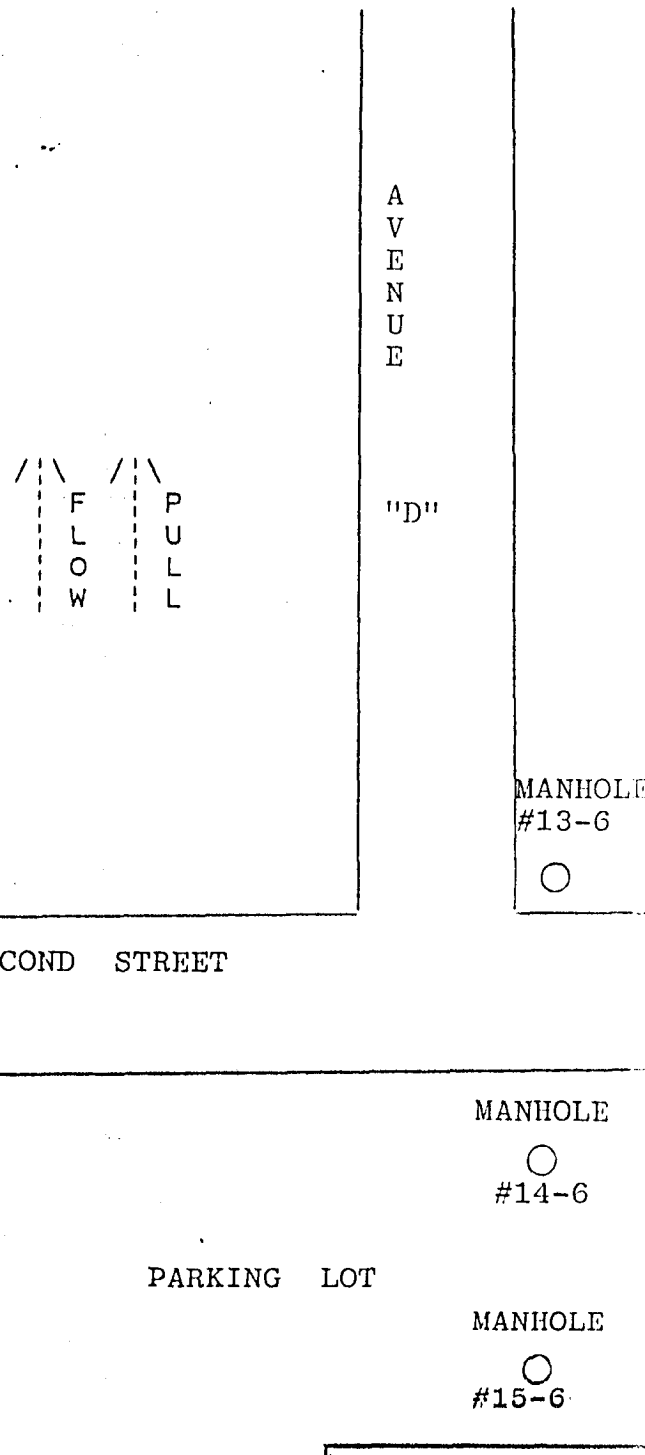
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #1

PIPE CONDITION: GOOD

GRADE: FAIR

REMARKS: EXCESSIVE MATERIAL IN LINE.



Run 1 Page 1

Client A. N. WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL					X	64.0
LATERAL			X	X		103.0
MANHOLE #14-6						260.0
END OF RUN						

RECEIVED
OCT 22 1990

Pacific Pipeline Survey

AN WEST, INC.
Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A. N. WEST

DATE: OCTOBER 10, 1990 RUN NO: 2

PIPE SIZE: 15" & 18" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: _____

STREET: "D" STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #12-6
TO MANHOLE #11-6

OPERATOR: ROB MAGOWAN

TOTAL RUN: 415.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

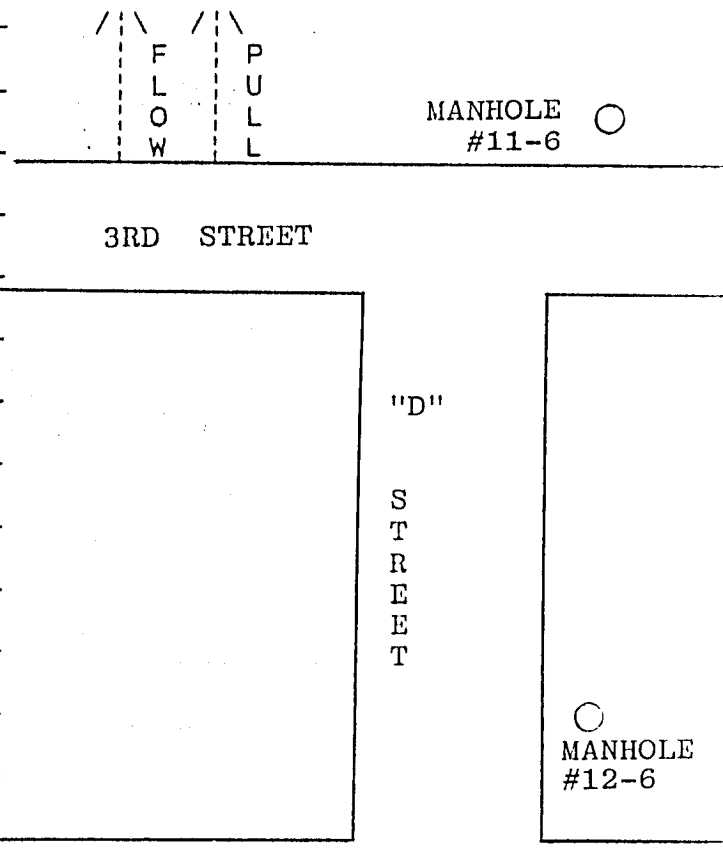
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #1

PIPE CONDITION: FAIR

GRADE: GOOD

REMARKS: _____



Run 2 Page 1

Client A. N. WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
ROOTS	4					251.0
ROOTS	1					254.5
ROOTS	2					257.5
LATERAL	--	X				273.5
MANHOLE #1 -6						415.0
END OF RUN						

RECEIVED
OCT 22 1990
AN WEST, INC.

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A. N. WEST

DATE: OCTOBER 11, 1990 RUN NO: 3

PIPE SIZE: 15" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 6'

STREET: "F" AVENUE AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #5-6-65
TO MANHOLE #5-6-54

OPERATOR: ROB MAGOWAN

TOTAL RUN: 239.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

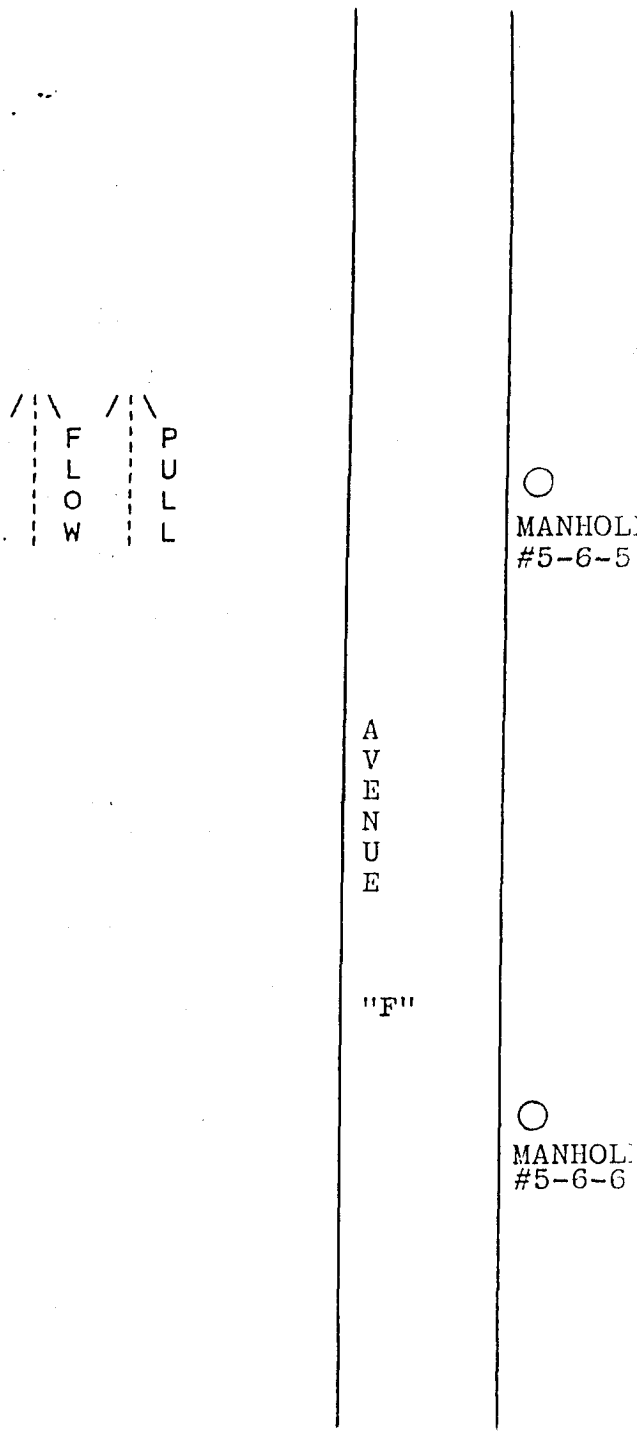
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #1

PIPE CONDITION: POOR

GRADE: POOR

REMARKS: EXCESSIVE MATERIAL THROUGHOUT.



Run 3 Page 1

Client A. N. WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
COULD NOT PASS EXCESS MATERIAL						239.0
END OF RUN						

RECEIVED
OCT 22 1990
AN WEST, INC.

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A. N. WEST

DATE: OCTOBER 11, 1990 RUN NO: 4

PIPE SIZE: 15" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: .

STREET: FLIGHT LINE AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #46-6
TO MANHOLE #46-5, TO MANHOLE #46-4

OPERATOR: ROB MAGOWAN

TOTAL RUN: 605.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

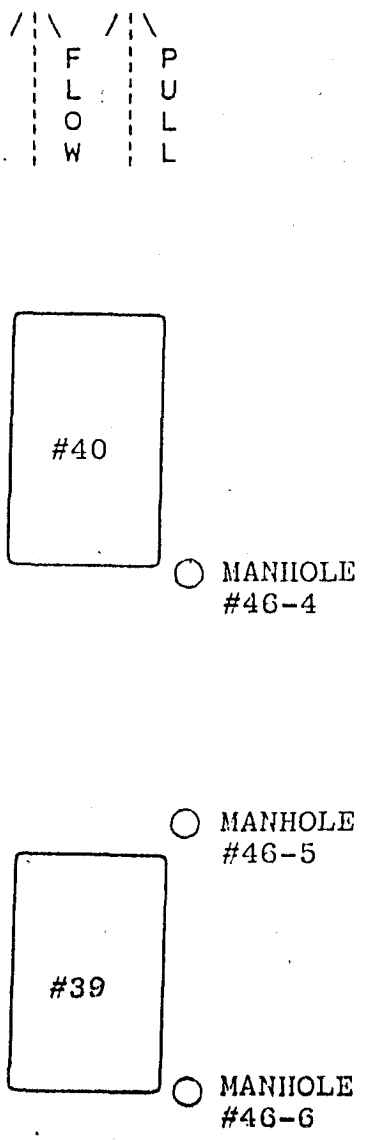
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #1

PIPE CONDITION: FAIR TO GOOD

GRADE: FAIR

REMARKS: EXCESSIVE MATERIAL THROUGHOUT.



Run 4 Page 1

Client A.N. WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X				38.0
LATERAL		X				48.0
LATERAL		X				79.0
LATERAL						120.0
LATERAL		X				131.0
LATERAL		X				162.0
LATERAL		X				203.0
LATERAL		X				223.0
LATERAL		X				244.0
POSSIBLE HOLE IN TOP OF PIPE						260.0
MANHOLE #46-5						276.0
MANHOLE #46-4						605.0
END OF RUN						

Pacific Pipeline Survey

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CLIENT: A. N. WEST

DATE: OCTOBER 15, 1990 RUN NO: 5

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: ____

STREET: _____ AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #46-4 TO MANHOLE #46-3, TO MANHOLE #46-2 TO MANHOLE #46-1 TO MANHOLE #46

OPERATOR: ROB MAGOWAN

TOTAL RUN: 1,077.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: ____

JOINTS TESTED: _____ JOINTS SEALED: _____

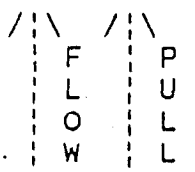
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #1 & #2

PIPE CONDITION: FAIR TO GOOD

GRADE: GOOD

REMARKS: _____



Run 5 Page 1

Client A. N. WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X				13.0
LATERAL		X				37.0
LATERAL		X				55.0
LATERAL		X				78.0
LATERAL		X				118.0
LATERAL		X				134.0
LATERAL		X			X	141.0
LATERAL		X				157.5
LATERAL		X				199.0
LATERAL		X				218.0
LATERAL		X				239.0
LATERAL		X				259.0
MANHOLE #46-3						273.0
MANHOLE #46-2						596.0
LATERAL		X				617.0
LATERAL PROTRUDING 3" (BREAK)		X				637.0
LATERAL PROTRUDING 2"		X				647.0
LATERAL PROTRUDING 3"		X				678.0
LATERAL PROTRUDING 3"		X				721.0
LATERAL PROTRUDING 1"		X			X	730.0
LATERAL PROTRUDING 2"		X			X	739.0
LATERAL PROTRUDING 3"		X				758.0
LATERAL PROTRUDING 4"		X				799.5
LATERAL PROTRUDING 4" (INFILTRATION STAINS)		X				817.0
LATERAL PROTRUDING 2" (INFILTRATION STAINS)		X				840.0

Run 5 Page 2

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TV INSPECTION REPORT

4 1
3 2

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REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL PROTRUDING 2"		X				850.0
MANHOLE 4-6-1						870.0
CHANGED TO TAPE #2						876.0
LATERAL				X		904.0
BREAK AT TOP						1072.0
MANHOLE #46						1077.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 16, 1990 RUN NO: 6

PIPE SIZE: 12" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 3'

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN 14D-1A TO BEND AT 50.0'

OPERATOR: ROB MAGOWAN

TOTAL RUN: 50.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

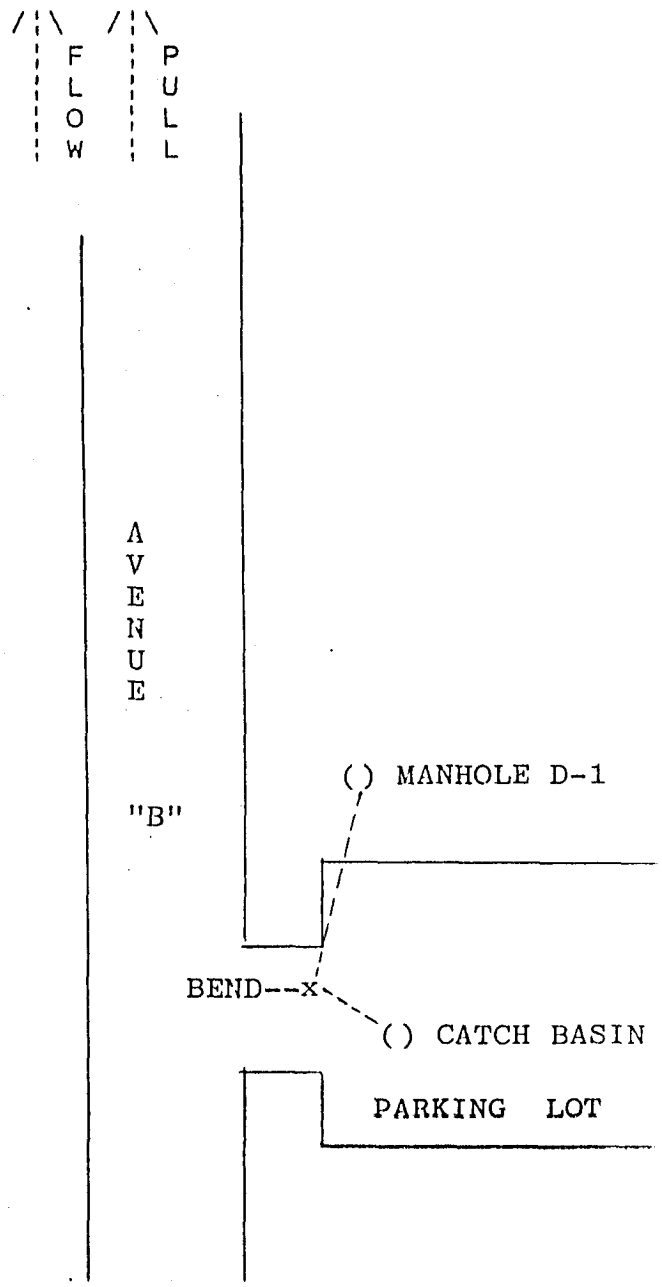
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #2

PIPE CONDITION: FAIR

GRADE: GOOD

REMARKS: _____



Run 6 Page 1

Client A. N. WEST

TV

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL - BEND		X	X			50.0
END OF RUN AT BEND						50.0

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CLIENT: A. N. WEST

DATE: OCTOBER 16, 1990 RUN NO: 7

PIPE SIZE: 12" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 8'

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TV FROM MANHOLE #14D1 TO BEND AT 131.0'

OPERATOR: ROB MAGOWAN

TOTAL RUN: 50.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

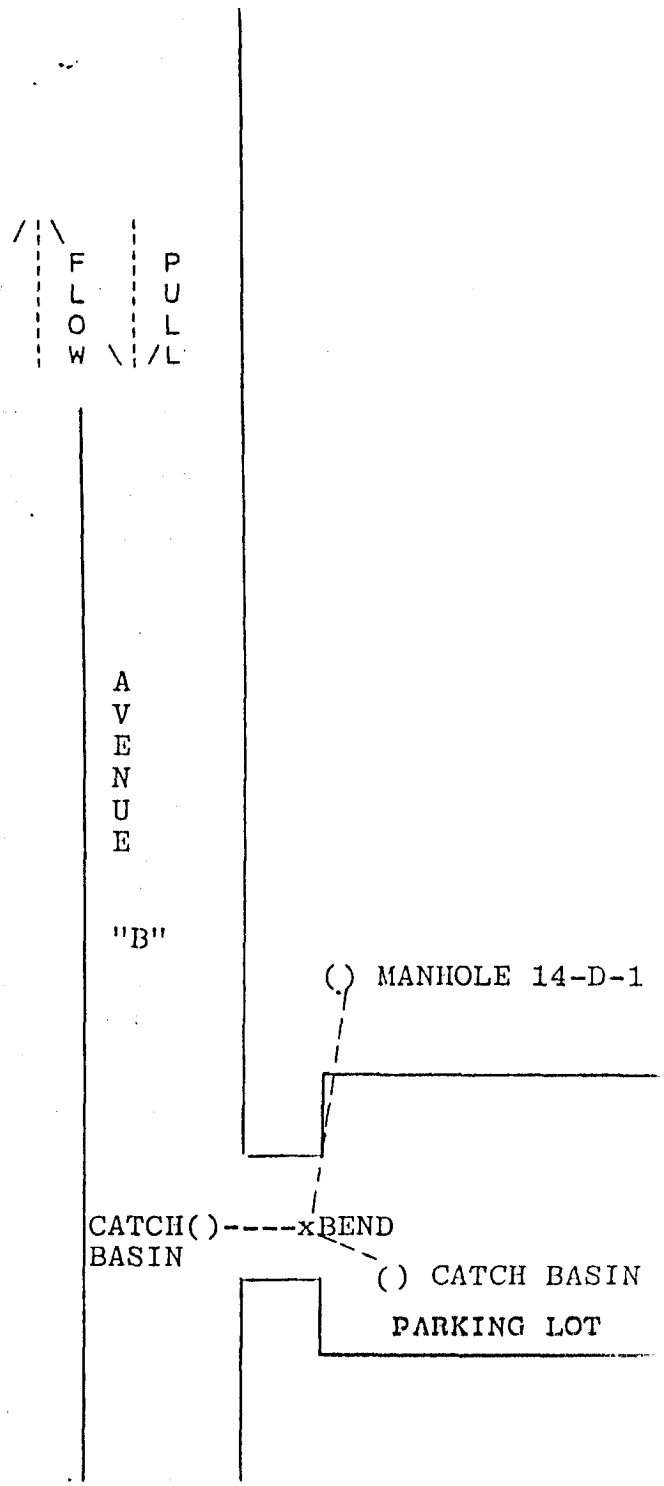
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #2

PIPE CONDITION: FAIR

GRADE: GOOD

REMARKS: _____



Run 7 Page 1

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X				71.0
END OF RUN AT BEND						131.0

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CLIENT: A. N. WEST

DATE: OCTOBER 16, 1990 RUN NO: 8

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 8'

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TV FROM MANHOLE #14D1

THRU MANHOLE #14D TO MANHOLE #14D2

OPERATOR: ROB MAGOWAN

TOTAL RUN: 470.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

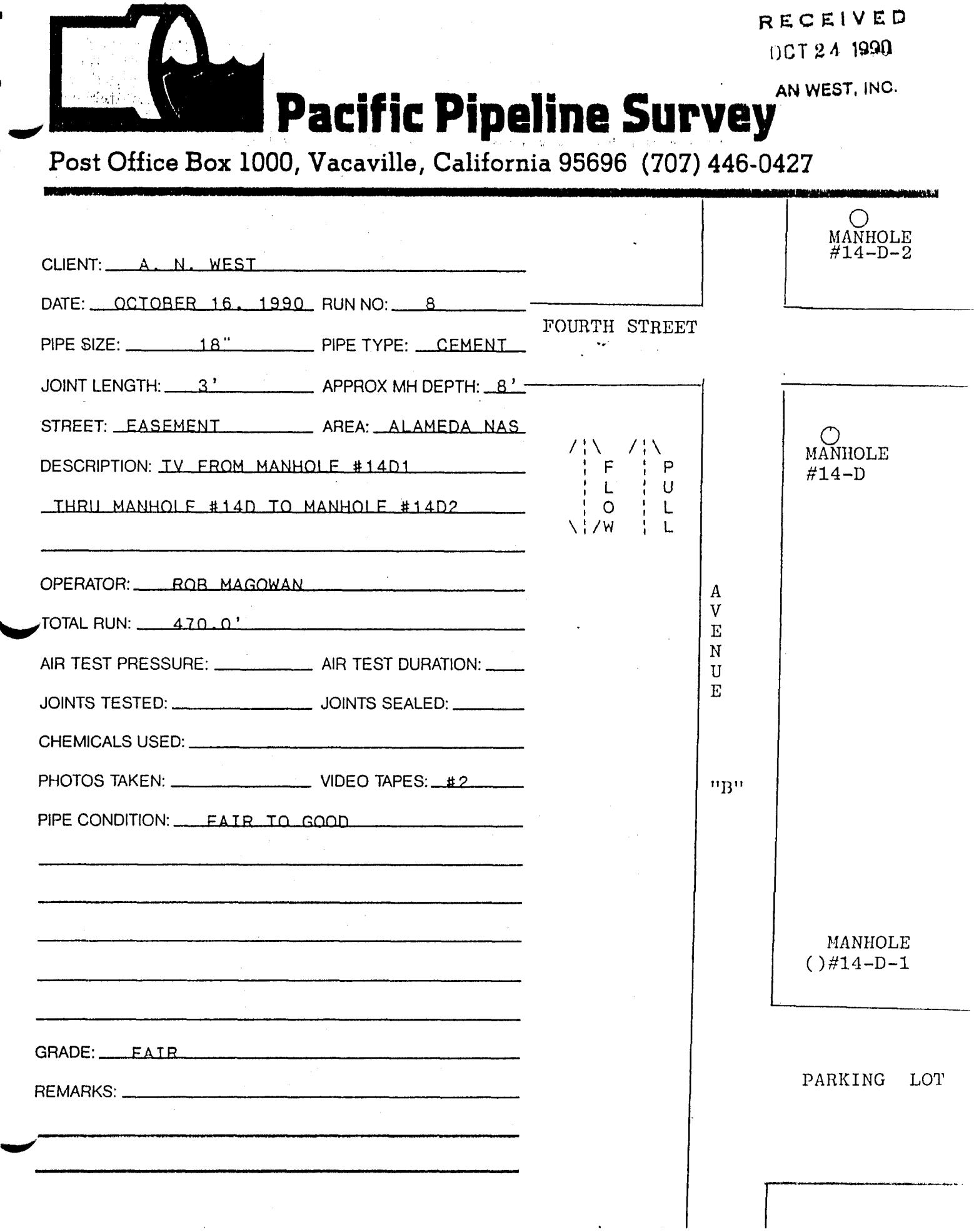
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #2

PIPE CONDITION: FAIR TO GOOD

GRADE: FAIR

REMARKS: _____



Run 3 Page 1

Client A. N. WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X	X			70.5
MANHOLE #14-D						233.0
INFILTRATION DEPOSITS AT JOINT						237.0
INFILTRATION DEPOSITS AT JOINT						247.0
LATERAL				X	X	418.0
MANHOLE #14-D-2						470.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 17, 1990 RUN NO: 9

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 8'

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TV FROM MANHOLE #2E-1 TO MANHOLE 2-E

OPERATOR: ROB MAGOWAN

TOTAL RUN: 250.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

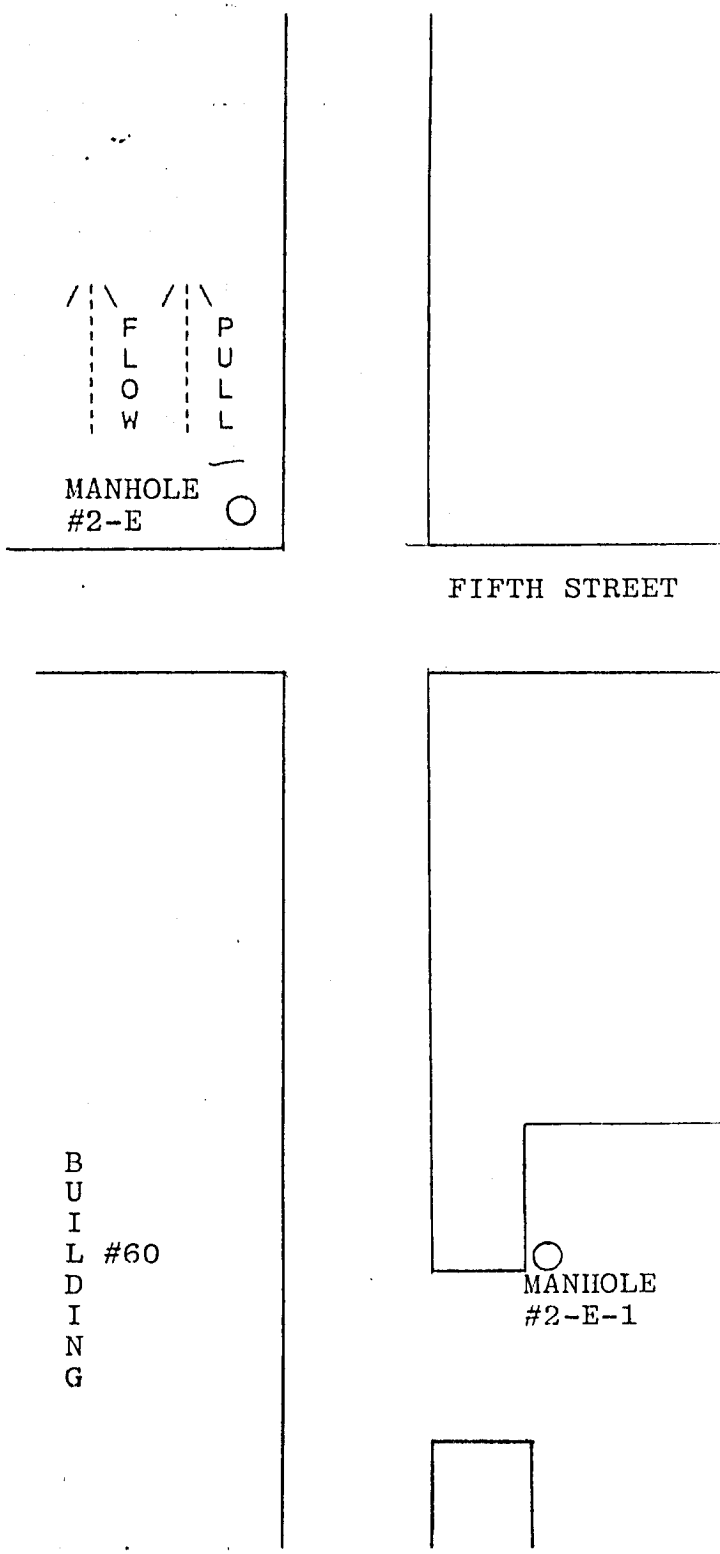
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #2

PIPE CONDITION: GOOD - WHAT WAS OBSERVED.

GRADE: UNKNOWN - CAMERA UNDERWATER

REMARKS: TIDE IN, WILL HAVE TO RE-TV.



Run 3 Page 1

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
END OF RUN - CAMERA UNDERWATER, TIDE IN						250.0
WILL HAVE TO RE-TELEVISE						

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CLIENT: A. N. WEST

DATE: OCTOBER 19, 1990 RUN NO: 10

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 6'

STREET: EASEMENT OFF AVENUE "A" AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE 3D-1
TO MANHOLE 3D

OPERATOR: ROB MAGOWAN

TOTAL RUN: 303.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

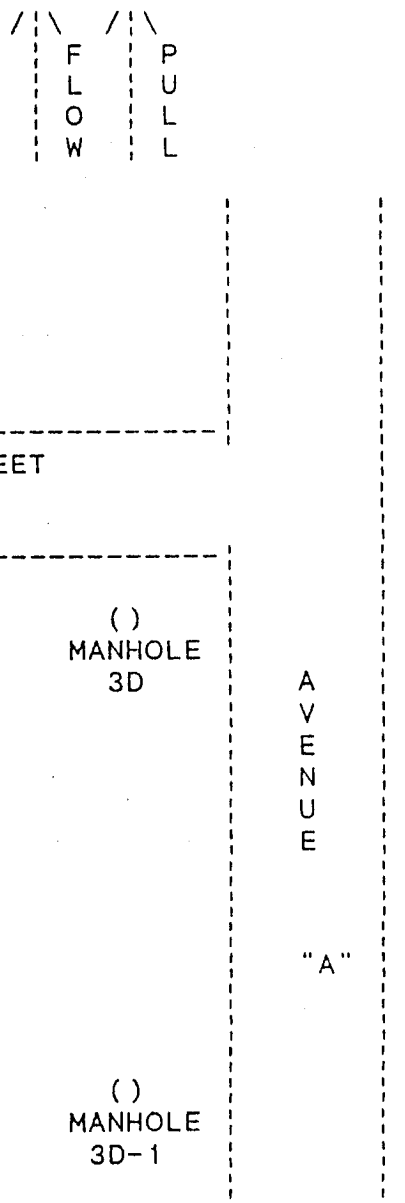
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #2

PIPE CONDITION: FAIR TO GOOD
WITH NOTED EXCEPTIONS

GRADE: GOOD - WHAT WAS OBSERVED

REMARKS: LOST HEADLIGHT AT 287'



Run 3-G AND 2-G NOT EXISTING. Page

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
10 1						
A.N. WEST						
LATERAL				X	X	280.0
BREAK (CHANGE IN PIPE SIZE OR POSSIBLE REPAIR)						283.0
MANHOLE 3-D						303.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 19, 1990 RUN NO: 11

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 6'

STREET: EASEMENT OFF AVENUE "C" AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE 12D TO MANHOLE 11D

OPERATOR: ROB MAGOWAN

TOTAL RUN: 168.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

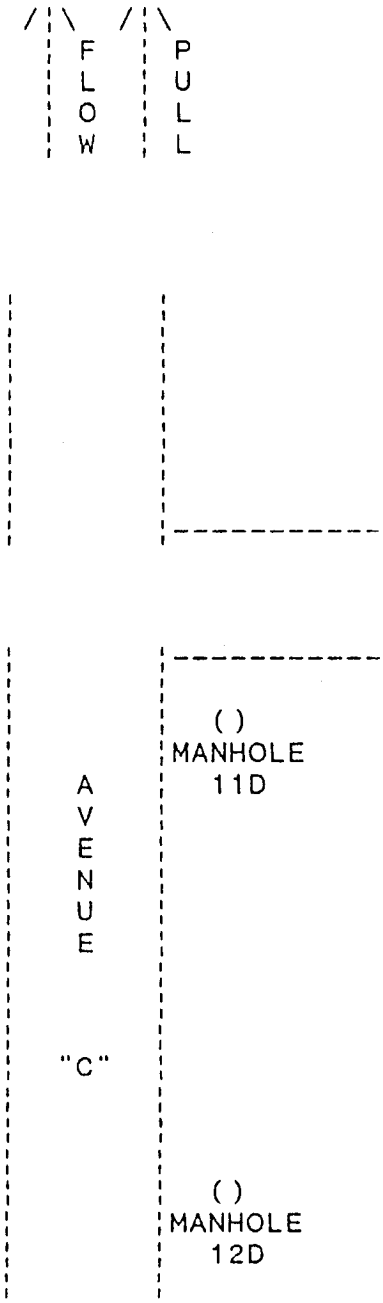
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #2

PIPE CONDITION: UNKNOWN - COULD NOT SEE UNDERWATER.

GRADE: UNKNOWN - COULD NOT SEE

REMARKS: UNDERWATER.



Run 11 Page 1

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
COULD NOT SEE - CAMERA UNDERWATER						168.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 22, 1990 RUN NO: 12

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 5'

EASEMENT
STREET: OFF AVENUE "F" AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE 5G-4 THRU MANHOLE #5G-3, #5G-3A, #5G-1, TO MANHOLE 5-G

OPERATOR: ROB MAGOWAN

TOTAL RUN: 1085.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

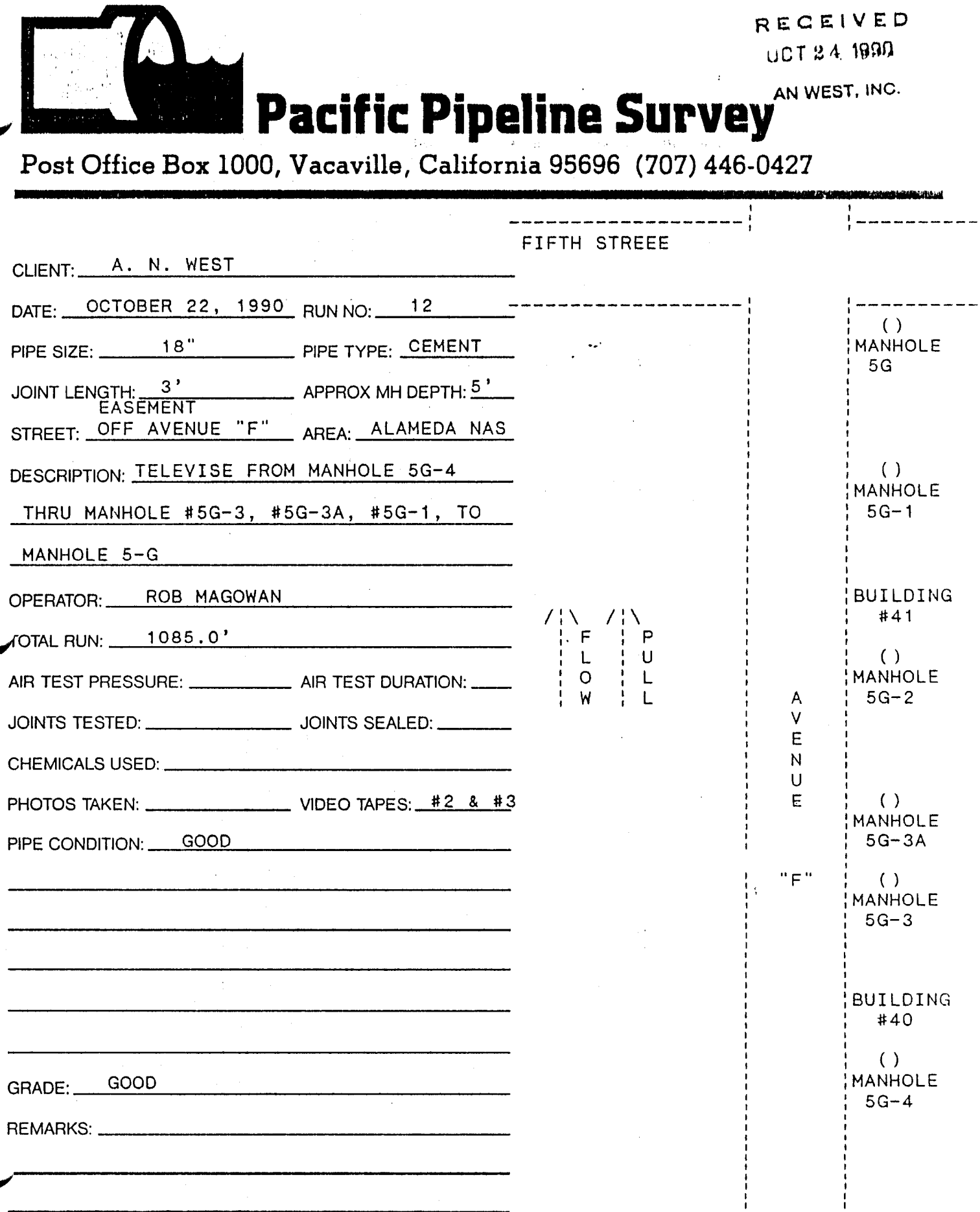
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #2 & #3

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



Run 12 Page 1

Client A. N. WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X				34.5
LATERAL					X	34.5
LATERAL					X	53.0
LATERAL					X	77.0
LATERAL					X	119.0
LATERAL					X	134.0
LATERAL					X	158.0
LATERAL					X	198.0
LATERAL					X	218.0
LATERAL					X	239.0
LATERAL					X	259.0
MANHOLE #5-G-3						299.0
MANHOLE #5-G-3-A						390.0
LATERAL		X	X			483.0
PIPE CHANGES TO 27"						599.0
MANHOLE #5-G-2						599.0
LATERAL					X	616.0
LATERAL					X	640.0
LATERAL		X				648.0
LATERAL					X	650.0
LATERAL					X	682.0
LATERAL					X	720.0
LATERAL					X	729.0
LATERAL					X	762.0
LATERAL					X	802.0

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CLIENT: A. N. WEST

DATE: OCTOBER 22, 1990 (30" SLIP) RUN NO: 13

PIPE SIZE: 36" PIPE TYPE: CEMENT

JOINT LENGTH: 40' EASEMENT APPROX MH DEPTH: 9.9'

STREET: OFF 5TH STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE 5G THRU MANHOLE #4-G, #3-G, TO MANHOLE 2-G

OPERATOR: ROB MAGOWAN

TOTAL RUN: 964.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

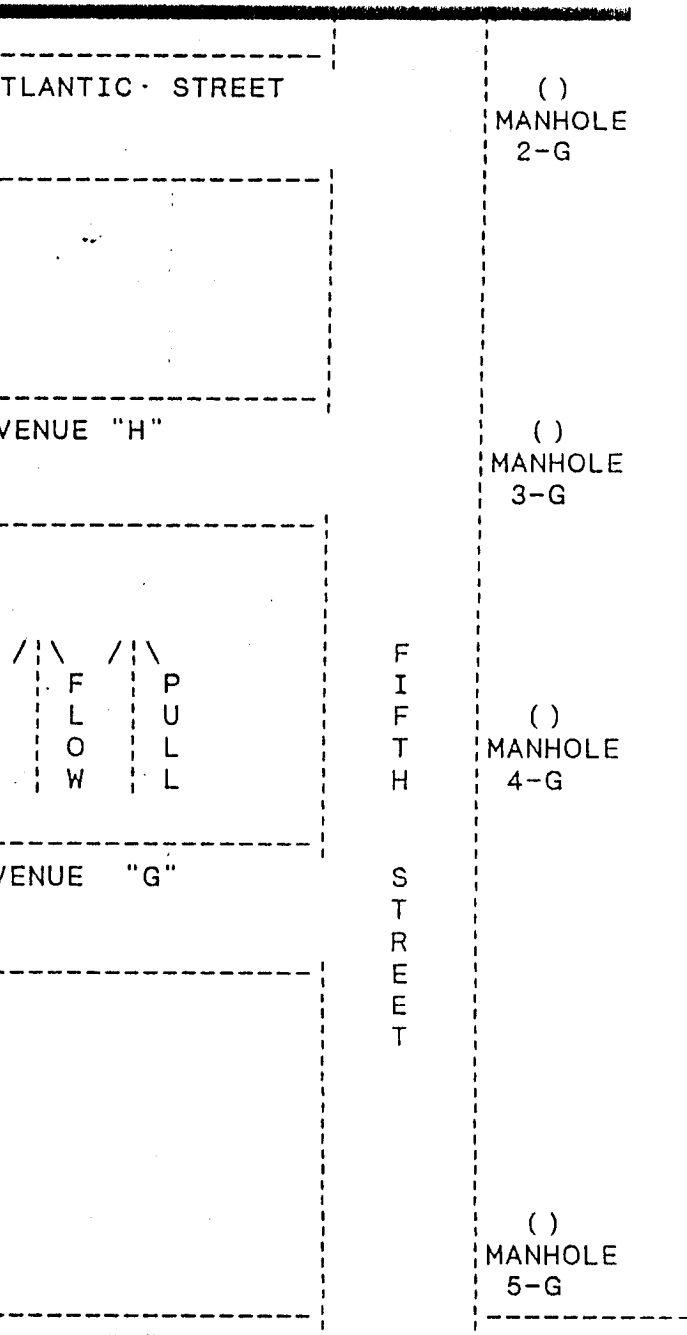
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #3

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: MANHOLE ON PLANS BETWEEN



Run 13 Page 1

Client A. N. WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
MANHOLE #4-G						406.0
MANHOLE #3-G						688.0
MANHOLE #2-G						964.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 23, 1990 (30" SLIP) RUN NO: 14

PIPE SIZE: 36" PIPE TYPE: CEMENT

JOINT LENGTH: 40' EASEMENT APPROX MH DEPTH: 10'

STREET: OFF 5TH STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE 2G TO MANHOLE #1-G

OPERATOR: ROB MAGOWAN

TOTAL RUN: 282.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

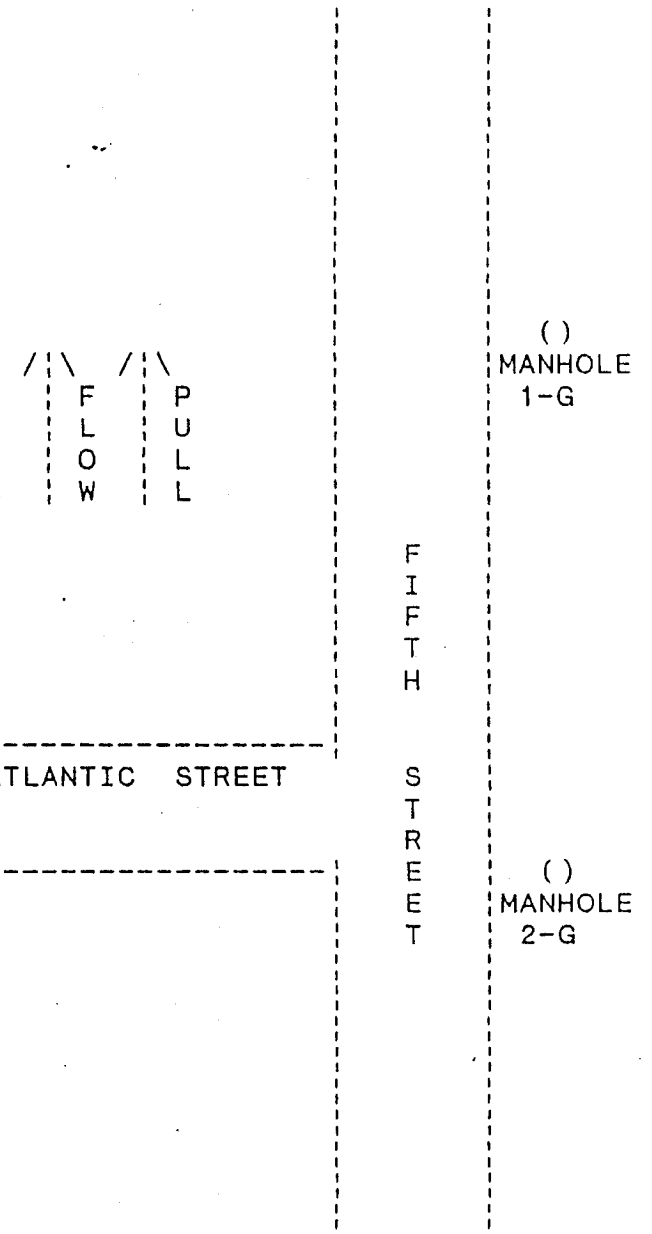
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: #3

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X				23.0
MANHOLE #1-G						282.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 23, 1990 RUN NO: 15

PIPE SIZE: 15" PIPE TYPE: CEMENT

JOINT LENGTH: 4' APPROX MH DEPTH: 8'

STREET: PARKING LOT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #6-H7
THRU MANHOLE #6-H6, #6-H5 TO
MANHOLE #6-H4

OPERATOR: ROB MAGOWAN

TOTAL RUN: 866.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

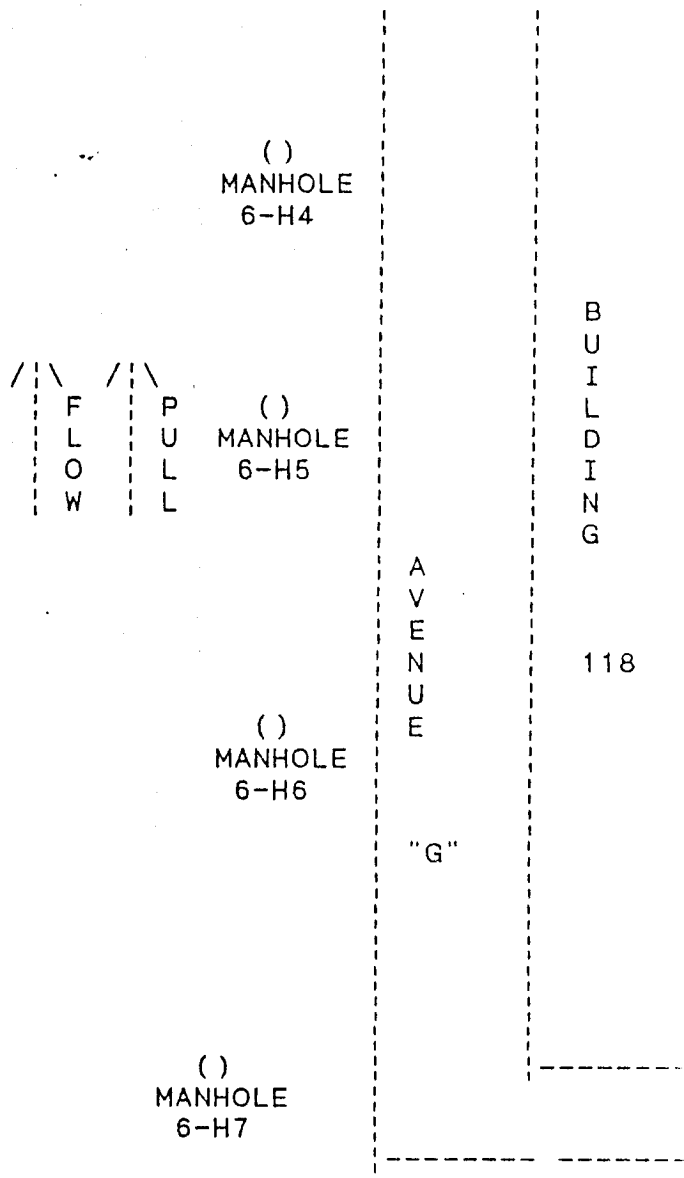
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 3 & 4

PIPE CONDITION: FAIR

GRADE: FAIR TO POOR

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
MANHOLE #6-H-6						303.0
CHANGED TO TAPE #4						608.0
MANHOLE #6-H-5						608.0
INFILTRATION AT JOINT						644.5
CAMERA UNDERWATER (DIP IN GRADE)						655.0 TO 866.0
MANHOLE #6-H-4						866.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 24, 1990 RUN NO: 16

PIPE SIZE: 12" PIPE TYPE: ACP

JOINT LENGTH: 4' APPROX MH DEPTH: 4'

STREET: PARKING LOT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #7-H2
THRU CATCH BASINS #7-H1, #7-H1-A
TO CATCH BASIN #7-H

OPERATOR: ROB MAGOWAN

TOTAL RUN: 523.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

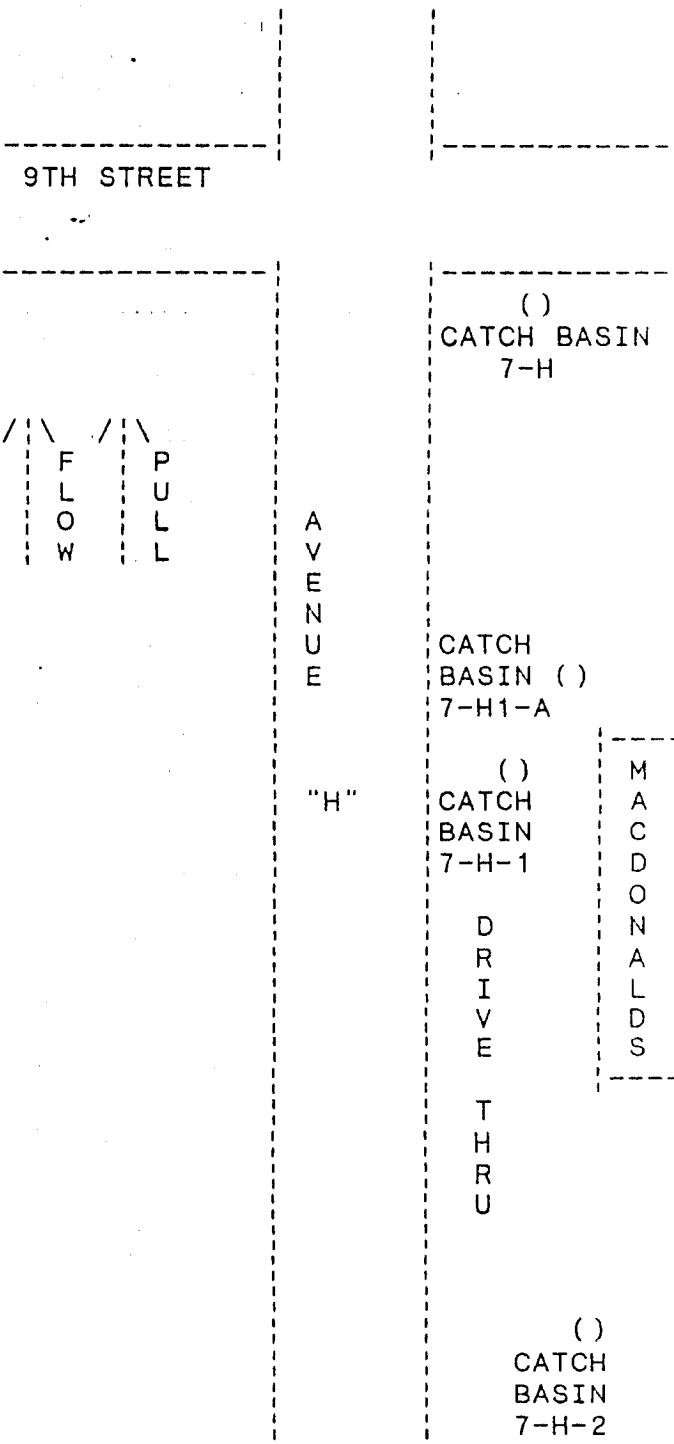
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 4

PIPE CONDITION: FAIR

GRADE: GOOD

REMARKS: AN EXCESS OF MATERIAL IN LINE.



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN #7-H-1						283.0
MAC DONALDS CATCH BASIN #7H-1-A (GREASE IN C.B.)						302.0
CATCH BASIN #7H						523.0
END OF RUN	--					

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CLIENT: A. N. WEST

DATE: OCTOBER 24, 1990 RUN NO: 17

PIPE SIZE: 36" PIPE TYPE: CEMENT

JOINT LENGTH: 8' APPROX MH DEPTH: 10'

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #6-H
THRU MANHOLES #5H, #4H, #3H TO
MANHOLE #1H

OPERATOR: ROB MAGOWAN

TOTAL RUN: 803.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

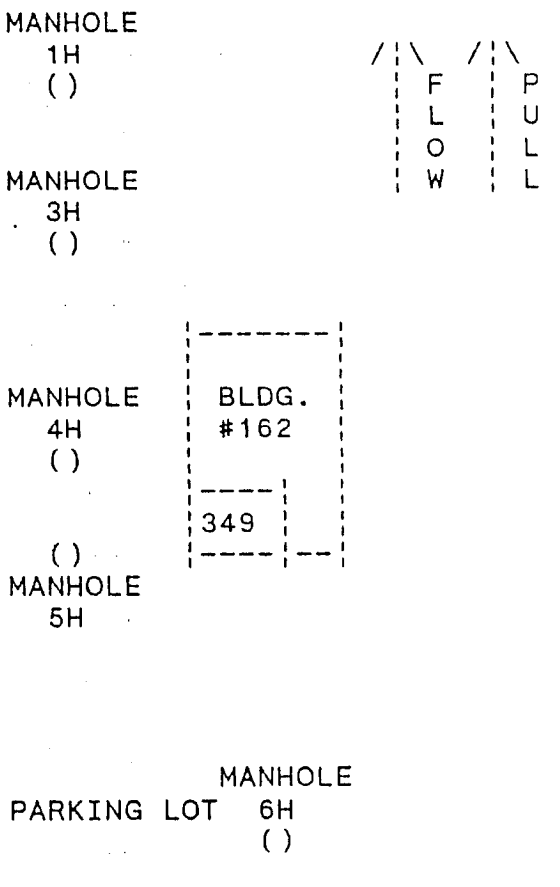
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 4

PIPE CONDITION: GOOD

GRADE: FAIR

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X			X	89.0
MANHOLE #5-H						215.0
MANHOLE #4-H						308.0
LATERAL		X				375.0
CAMERA UNDERWATER						566.0 TO 803.0
MANHOLE #3-H						650.0
MANHOLE #1-H						803.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 25, 1990 RUN NO: 18

PIPE SIZE: 36" PIPE TYPE: CEMENT

JOINT LENGTH: 4' APPROX MH DEPTH: 8'

STREET: ATLANTIC AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #8-H
TO MANHOLE #9-H

OPERATOR: ROB MAGOWAN

TOTAL RUN: 307.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

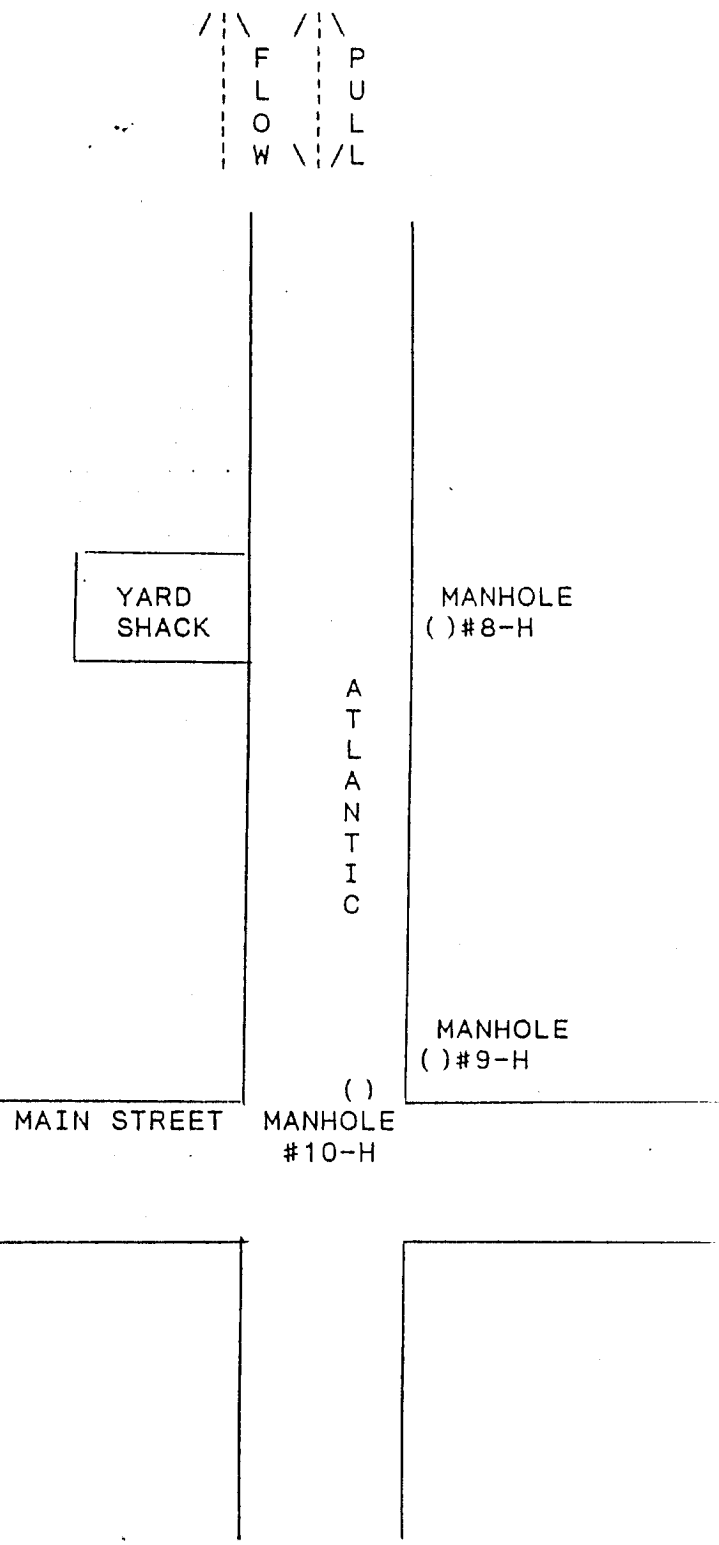
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 4

PIPE CONDITION: FAIR

GRADE: GOOD

REMARKS: TELEPHONE POLE STUCK IN
MANHOLE #9-H, PULLED OUT CAMERA
AND TVED FROM #9-H TO MANHOLE #8-H



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Client A. N. WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X				172.5
MANHOLE #9H (TELEPHONE POLE IN MANHOLE)						307.0
END OF RUN						

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Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A. N. WEST

DATE: OCTOBER 25, 1990 RUN NO: 19

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 7'

STREET: AVENUE D AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #11-G THRU MANHOLE #10-G THRU MANHOLE #9-G TO MATERIAL AT 672.0'

OPERATOR: ROB MAGOWAN

TOTAL RUN: 672.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

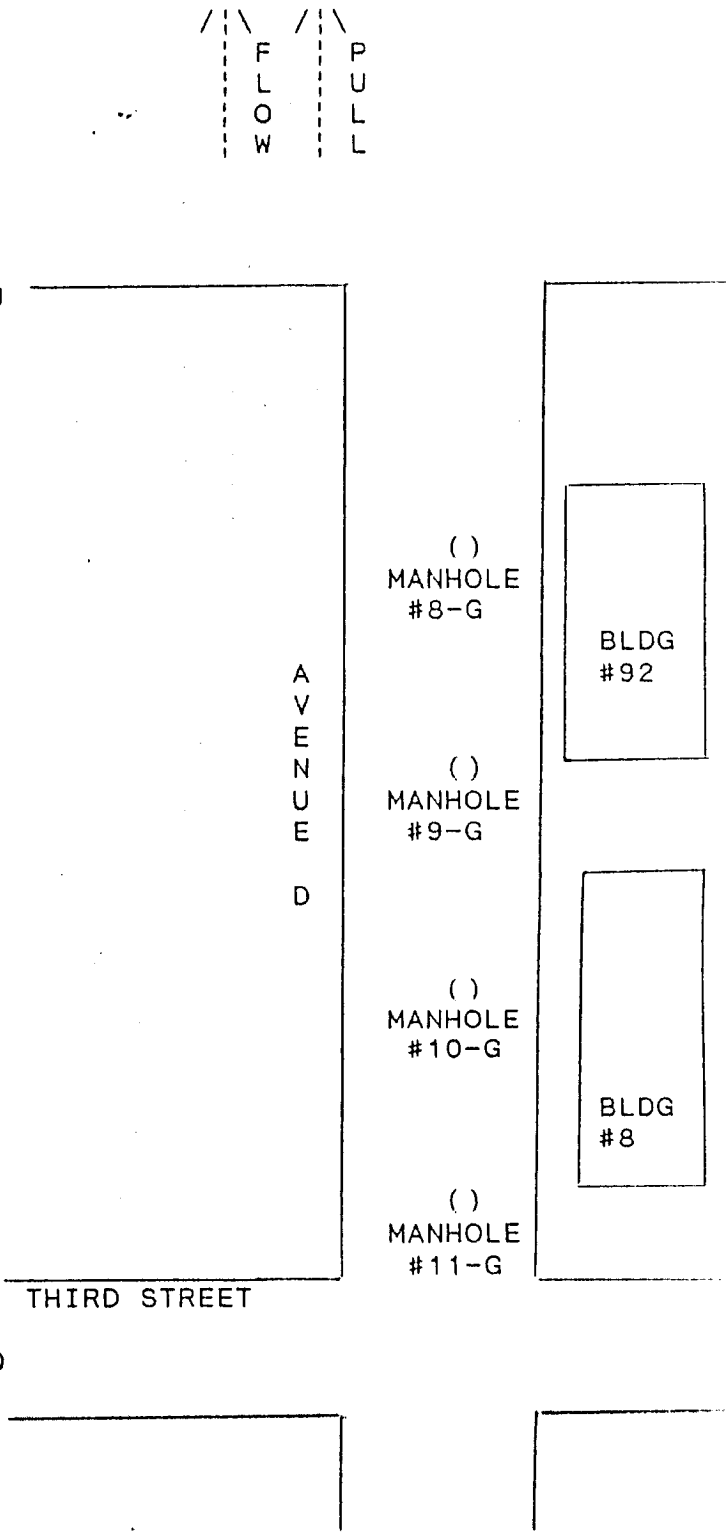
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 4 & 6

PIPE CONDITION: FAIR TO POOR
EXCESS MATERIAL IN LINE

GRADE: POOR - WITH NOTED DIP.

REMARKS: CAMERA LENS COVERED WITH BLACK OIL AFTER DIP, WIPED OFF LENS AND PULLED BACK FROM M.H. #10-G THEN RE-TVED FROM END OF DIP.



Run 19 Page 1

Client A. N. WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X	X			121.0
LATERAL					X	203.5
CAMERA UNDERWATER - DIP IN GRADE						203.0 TO 449.0
MANHOLE #10-G						310.0
CHANGED TO TAPE #6						312.0
LATERAL					X	457.0
LATERAL		X				529.0
MANHOLE #9-G						622.0
MATERIAL IN LINE - COULD NOT PASS						672.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 24, 1990 RUN NO: 20

PIPE SIZE: 21" PIPE TYPE: VCP

JOINT LENGTH: 3' APPROX MH DEPTH: 8'

STREET: NORFOLK ROAD AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #6-H8 THRU MANHOLES #6H-4, #6H-4A TO MANHOLE #7H

OPERATOR: KEN GANK

TOTAL RUN: 674.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

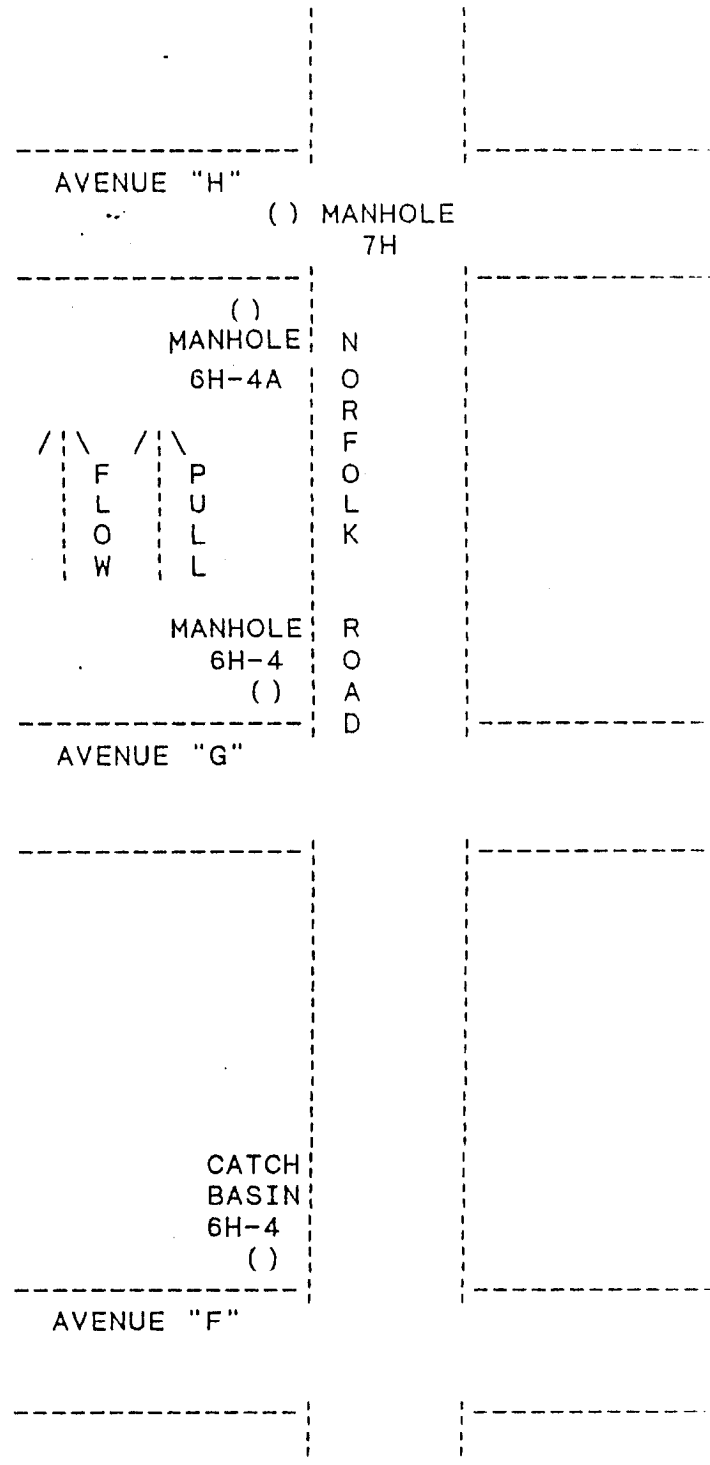
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 5

PIPE CONDITION: FAIR

GRADE: POOR - FROM 0.0' TO 448.0'

REMARKS: AN EXCESS OF MATERIAL IN LINE.



Run 20 Page 1

Client A.N. WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
MANHOLE #6-H-4						347.0
DIP IN GRADE - CAMERA UNDERWATER						347.0 TO 448.0
LARGE AMOUNT OF DEBRIS						507.0
MANHOLE 6-H-4-A						628.0
MANHOLE 7-H						674.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 29, 1990 RUN NO: 20

PIPE SIZE: 24" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 10'

STREET: 5TH STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #5-E TO MANHOLE #4-E

OPERATOR: ROB MAGOWAN

OTAL RUN: 280.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

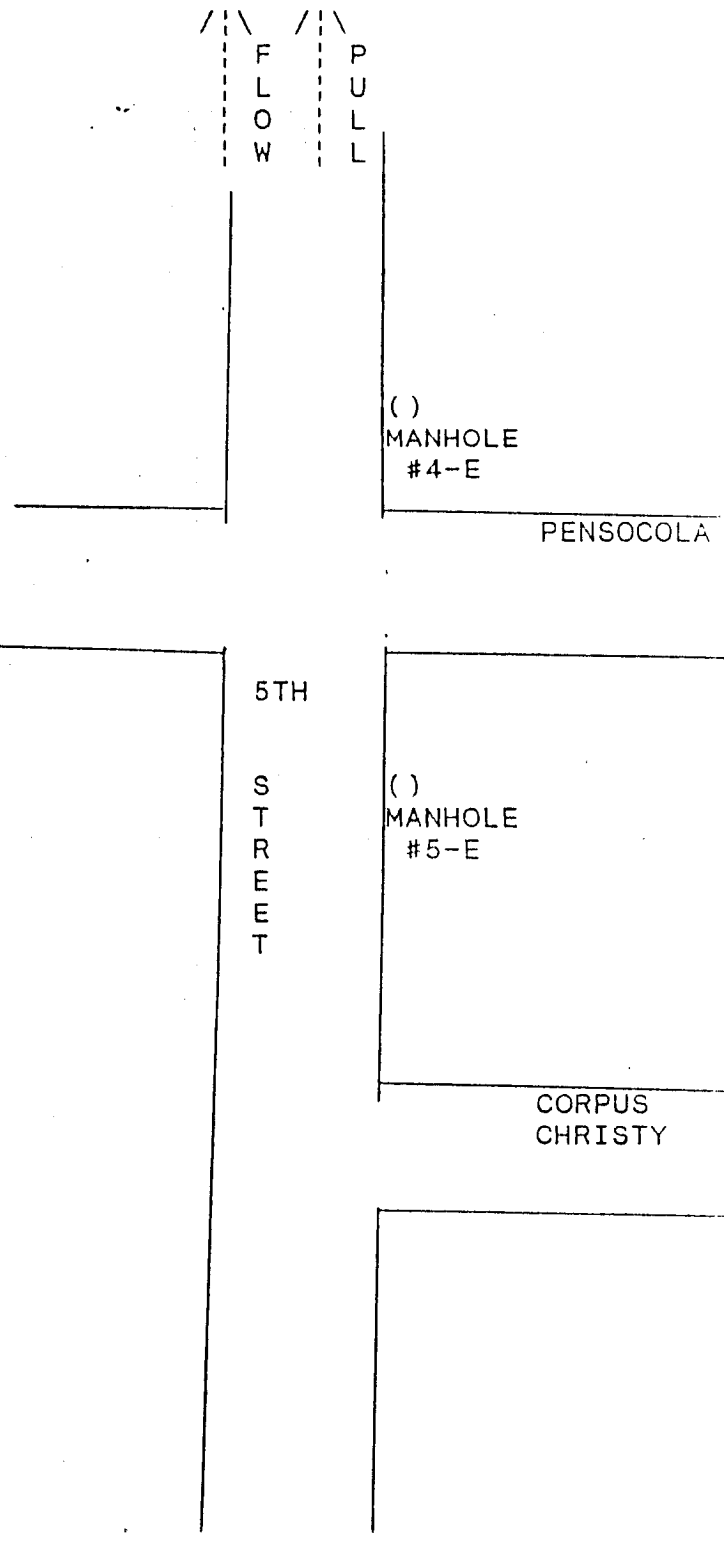
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 6

PIPE CONDITION: FAIR - WHAT WAS OBSERVED

GRADE: POOR - WITH NOTED DIP

REMARKS: _____



Run 10 Page 1

Client A. N. WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL				X	X	130.0
LATERAL		X	X			136.0
LATERAL		X	X			158.0
CAMERA UNDERWATER - DIP IN GRADE						178.0 TO 280.0
MANHOLE #4-E						280.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 25, 1990 RUN NO: 21

PIPE SIZE: 21" PIPE TYPE: VCP

JOINT LENGTH: 3' APPROX MH DEPTH: 10'

STREET: 9TH STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #7-H TO CATCH BASIN #7H-A

OPERATOR: KEN GANK

OTAL RUN: 128.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

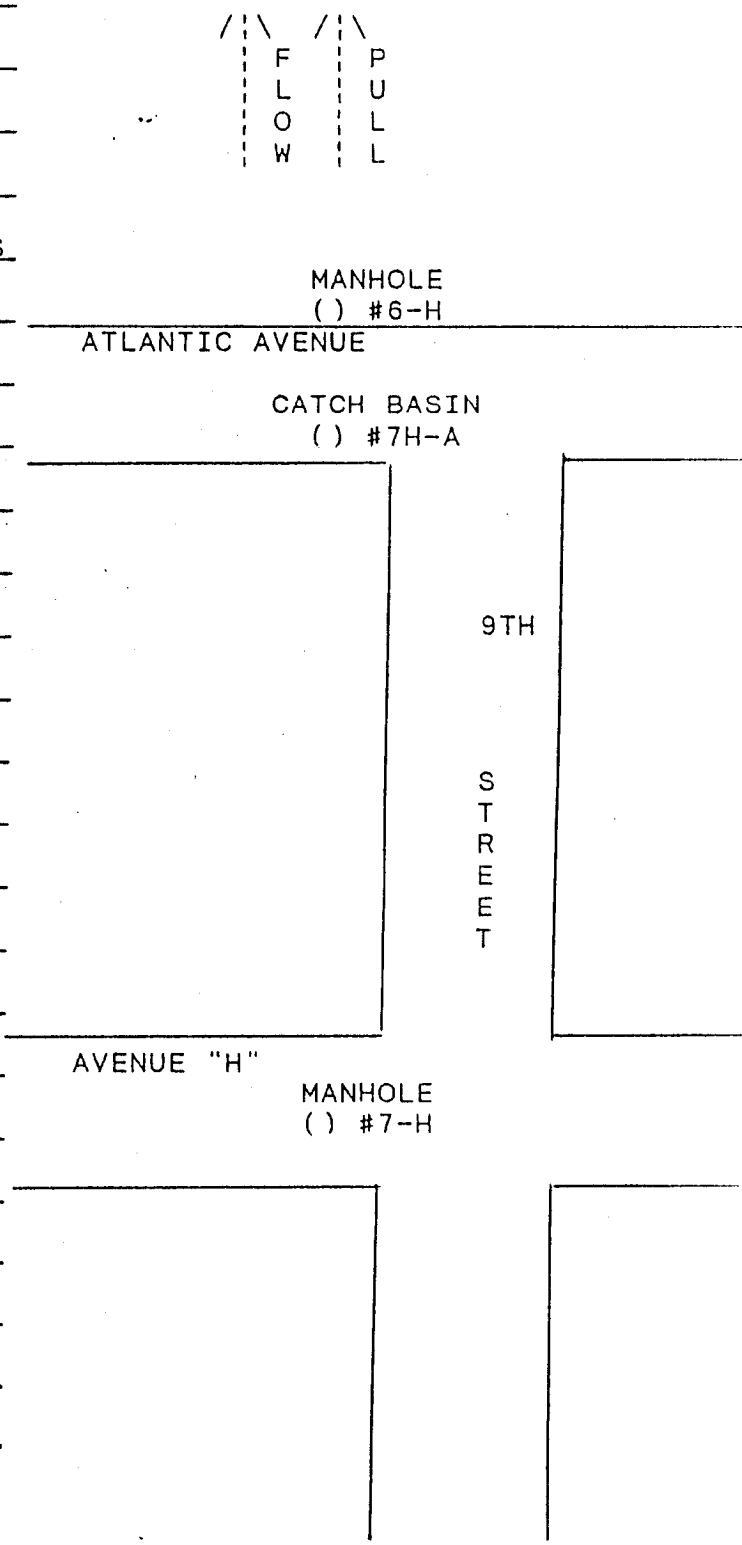
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 5

PIPE CONDITION: GOOD

GRADE: GOOD - WITH NOTED EXCEPTION

REMARKS: COULD NOT COMPLETE RUN DUE TO GROUT IN LINE MAKING IT IMPASSABLE.



Run 21 Page 1

Client A. N. WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X			X	119.0
HEAVY CONCRETE GROUT - COULD NOT PASS						128.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 25, 1990 RUN NO: 22

PIPE SIZE: 21" PIPE TYPE: VCP

JOINT LENGTH: 3' APPROX MH DEPTH: 10'

STREET: 9TH STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #6-H TO CATCH BASIN #7H-A TO MANHOLE #7-H

OPERATOR: KEN GANK

TOTAL RUN: 235.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

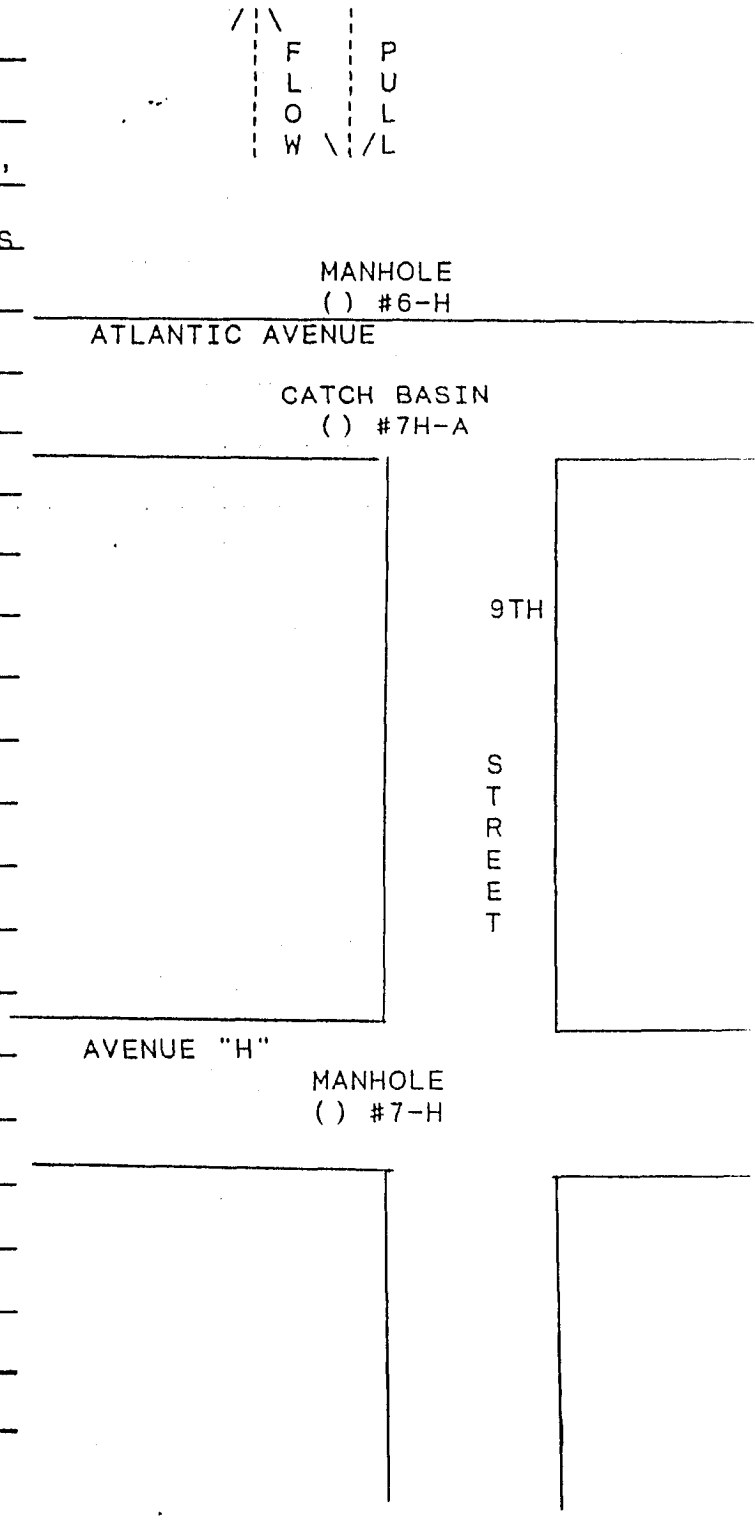
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 5

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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Client A. N. WEST

TV

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL						107.0
MANHOLE #7-H						235.0
END OF RUN						

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CLIENT: A N WEST

DATE: OCTOBER 25, 1990 RUN NO: 23

PIPE SIZE: 21" PIPE TYPE: VCP

JOINT LENGTH: 3' APPROX MH DEPTH: 10'

STREET: ATLANTIC AVENUE AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #6-H2 TO MANHOLE #6-H1

OPERATOR: KEN GANK

TOTAL RUN: 152.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

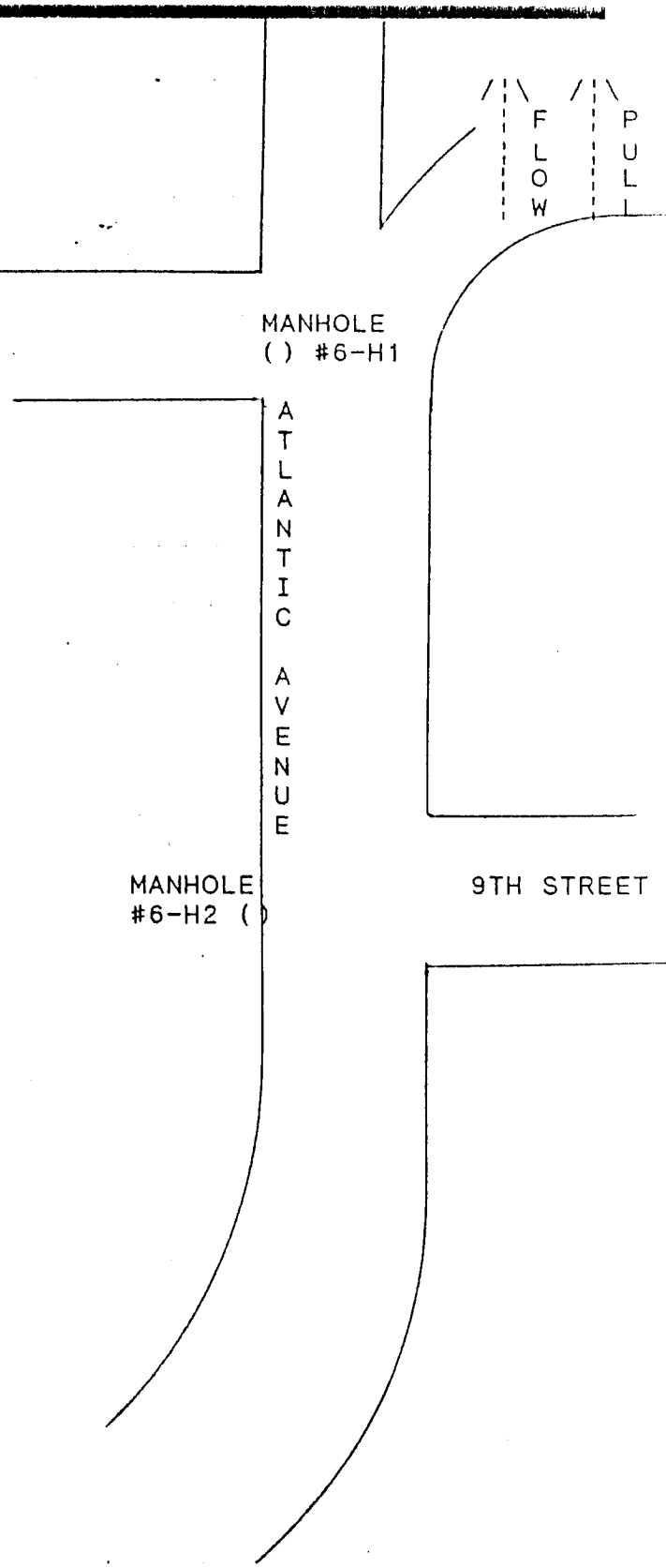
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 5

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
MANHOLE #6-H1						152.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 25, 1990 RUN NO: 24

PIPE SIZE: 21" PIPE TYPE: VCP

JOINT LENGTH: 3' APPROX MH DEPTH: 10'

STREET: EIGHTH STREET & ATLANTIC AVENUE AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #6-H1 TO MANHOLE #6-H

OPERATOR: KEN GANK

TOTAL RUN: 212.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

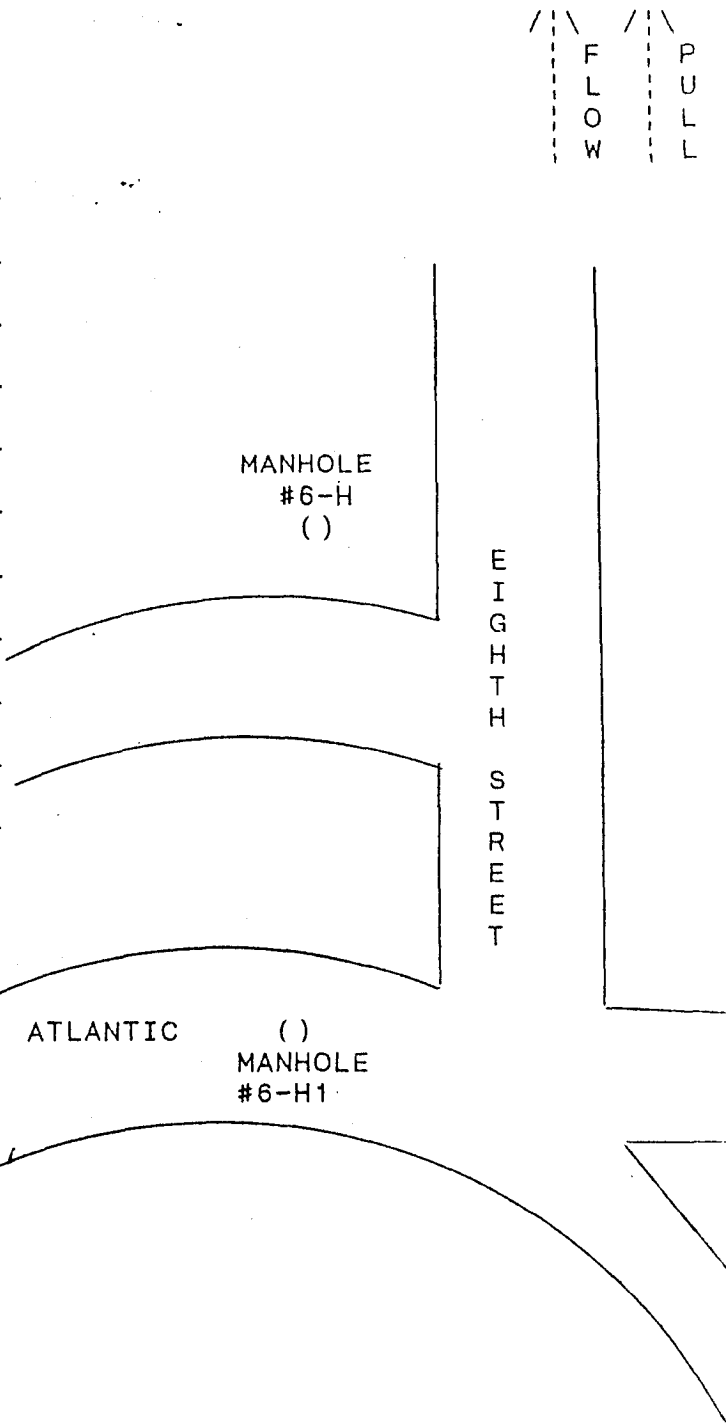
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 5

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
MANHOLE #6-H						212.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 29, 1990 RUN NO: 25

PIPE SIZE: 8" PIPE TYPE: VCP

JOINT LENGTH: 3' APPROX MH DEPTH: 2'

STREET: NORTH ATLANTIC AVENUE AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #6H-2C THRU CATCH BASIN #6H-2B TO CATCH BASIN #6H-2A

OPERATOR: TIM Mc LEAN

TOTAL RUN: 3.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

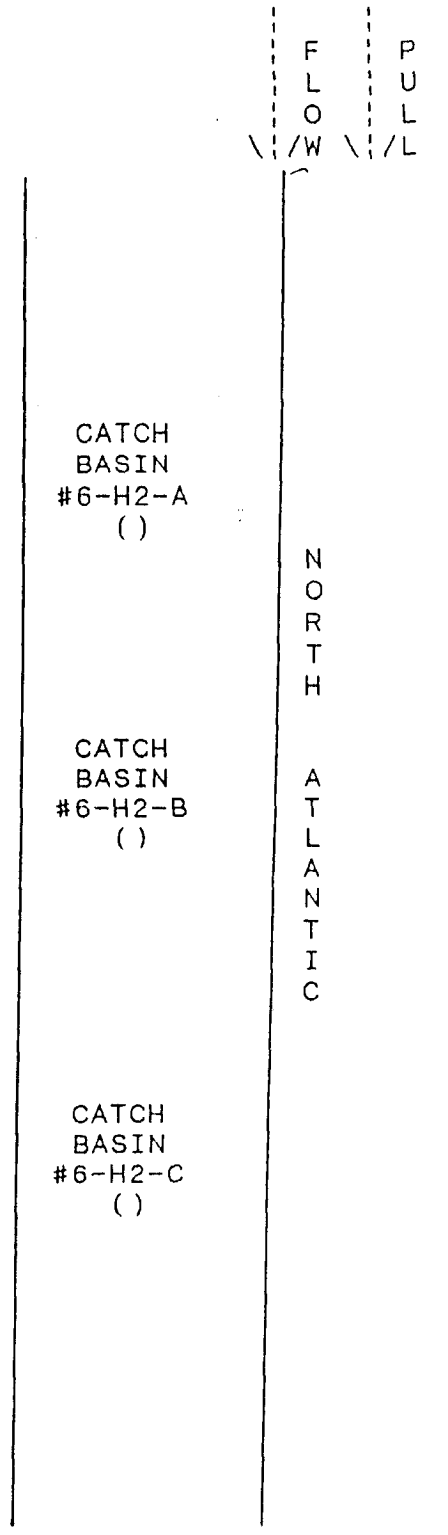
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 1

PIPE CONDITION: FAIR TO POOR - VERY DIRTY

GRADE: FAIR

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
SPIRAL BREAK AT FIRST JOINT						0.0
PIPE CHANGES TO 4" PVC						3.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 29, 1990 RUN NO: 26

PIPE SIZE: 8" PIPE TYPE: RCP

JOINT LENGTH: 4' APPROX MH DEPTH: 3'

STREET: ATLANTIC AVENUE AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #6H-2B TO CACTH BASIN #6H-2C

OPERATOR: TIM Mc LEAN

TOTAL RUN: 44.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

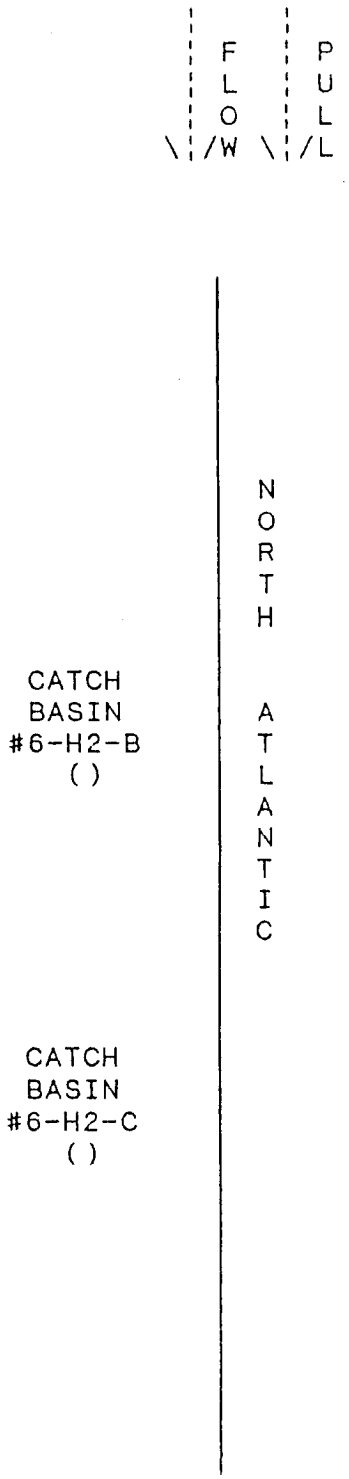
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 1

PIPE CONDITION: GOOD - LINE DIRTY.

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN #6H-2C						44.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 29, 1990 RUN NO: 27

PIPE SIZE: 12" PIPE TYPE: VCP

JOINT LENGTH: 3' APPROX MH DEPTH: 3'

STREET: NORTH ATLANTIC AVENUE AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #6H-2C TO CACTH BASIN #6H-2

OPERATOR: TIM Mc LEAN

TOTAL RUN: 6.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

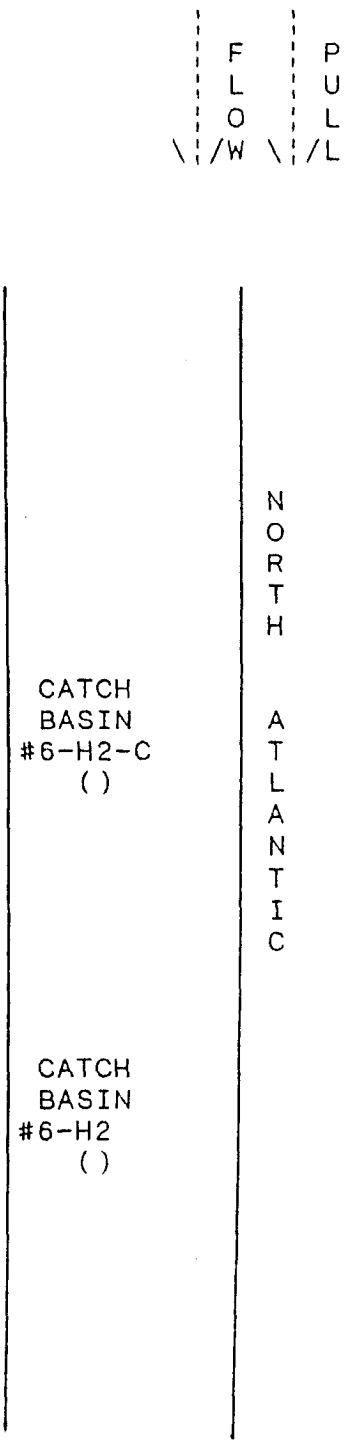
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 1

PIPE CONDITION: POOR - DUE TO OFFSET

GRADE: UNKNOWN

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
OFFSET - COULD NOT PASS						6.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 29, 1990 RUN NO: 28

PIPE SIZE: 12" PIPE TYPE: VCP

JOINT LENGTH: 3' APPROX MH DEPTH: 3'

STREET: AVENUE "I" AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #2H-1A
TO MANHOLE #2H-1

OPERATOR: TIM Mc LEAN

TOTAL RUN: 2.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

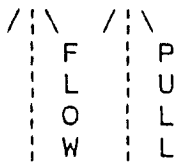
CHEMICALS USED: _____

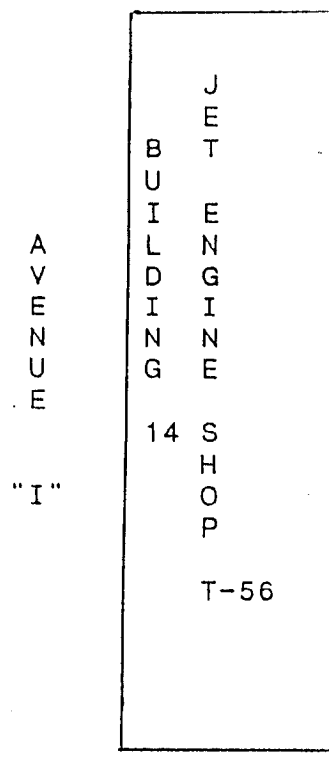
PHOTOS TAKEN: _____ VIDEO TAPES: 1

PIPE CONDITION: UNKNOWN

GRADE: UNKNOWN

REMARKS: UNABLE TO PASS 2' DUE TO SIPHON





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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
SIPHON - COULD NOT PASS						2.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 29, 1990 RUN NO: 29

PIPE SIZE: 8" PIPE TYPE: VCP

JOINT LENGTH: 3' APPROX MH DEPTH: 6'

STREET: AVENUE "I" AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #2H-1
TO MANHOLE #1H-1

OPERATOR: TIM Mc LEAN

TOTAL RUN: 32.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

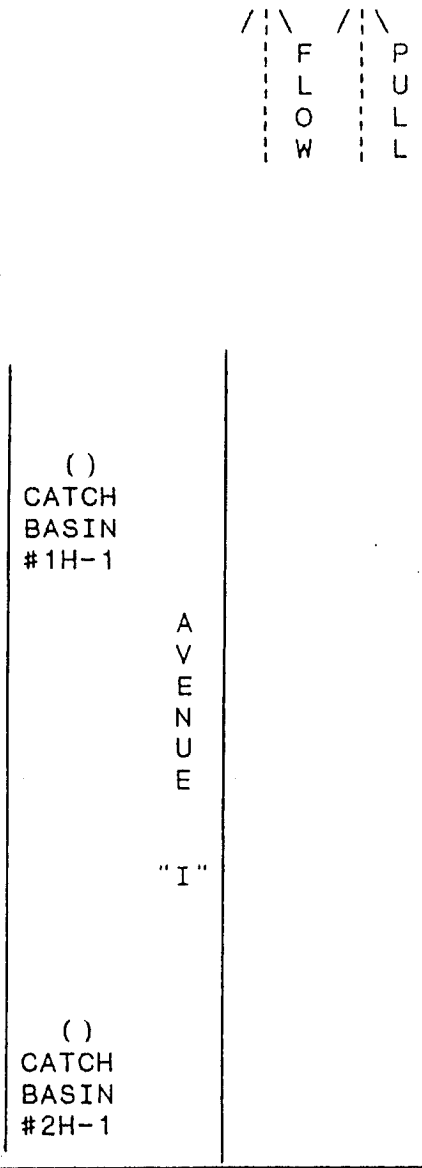
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 1

PIPE CONDITION: POOR - RADIAL CRACK AND
COULD NOT PASS 32' DUE TO DEBRIS.

GRADE: GOOD - WHAT WAS OBSERVED.

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	QUADRANT 3	QUADRANT 2	QUADRANT 1	FOOTAGE
RADIAL BREAK				X	X	7.0
COULD NOT PASS DUE TO DEBRIS						32.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 30, 1990 RUN NO: 30

PIPE SIZE: 24" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 10'

STREET: THIRD STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #9-D
TO MANHOLE #8-D TO MANHOLE #7-D

OPERATOR: ROB MAGOWAN

TOTAL RUN: 458.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

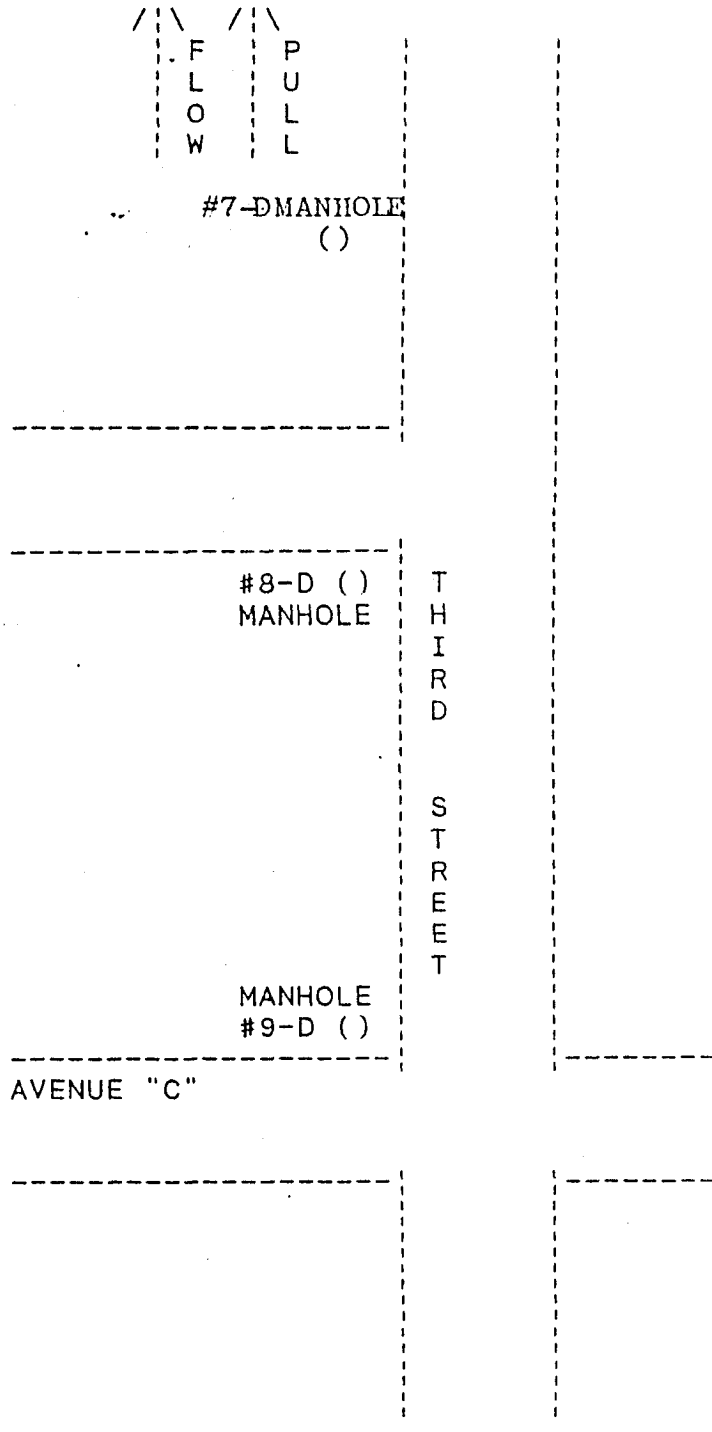
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 6

PIPE CONDITION: FAIR TO GOOD
COULD NOT PASS 32' DUE TO DEBRIS.

GRADE: GOOD

REMARKS: LOTS OF STEAM IN LINES.
HAD TO SUCK OUT WITH CLEANER.



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Client A N WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
MANHOLE #8-D						206.0
LATERAL		X	X			237.0
CAMERA UNDERWATER						365.0 TO
MANHOLE #7-D						458.0
END OF RUN						

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CLIENT: A. N. WEST

DATE: OCTOBER 30, 1990 RUN NO: 31

PIPE SIZE: 14" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 10'

STREET: AVENUE "C" AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #9-D
TO MANHOLE #9D-A TO MANHOLE #9D-1

OPERATOR: ROB MAGOWAN

TOTAL RUN: 324.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

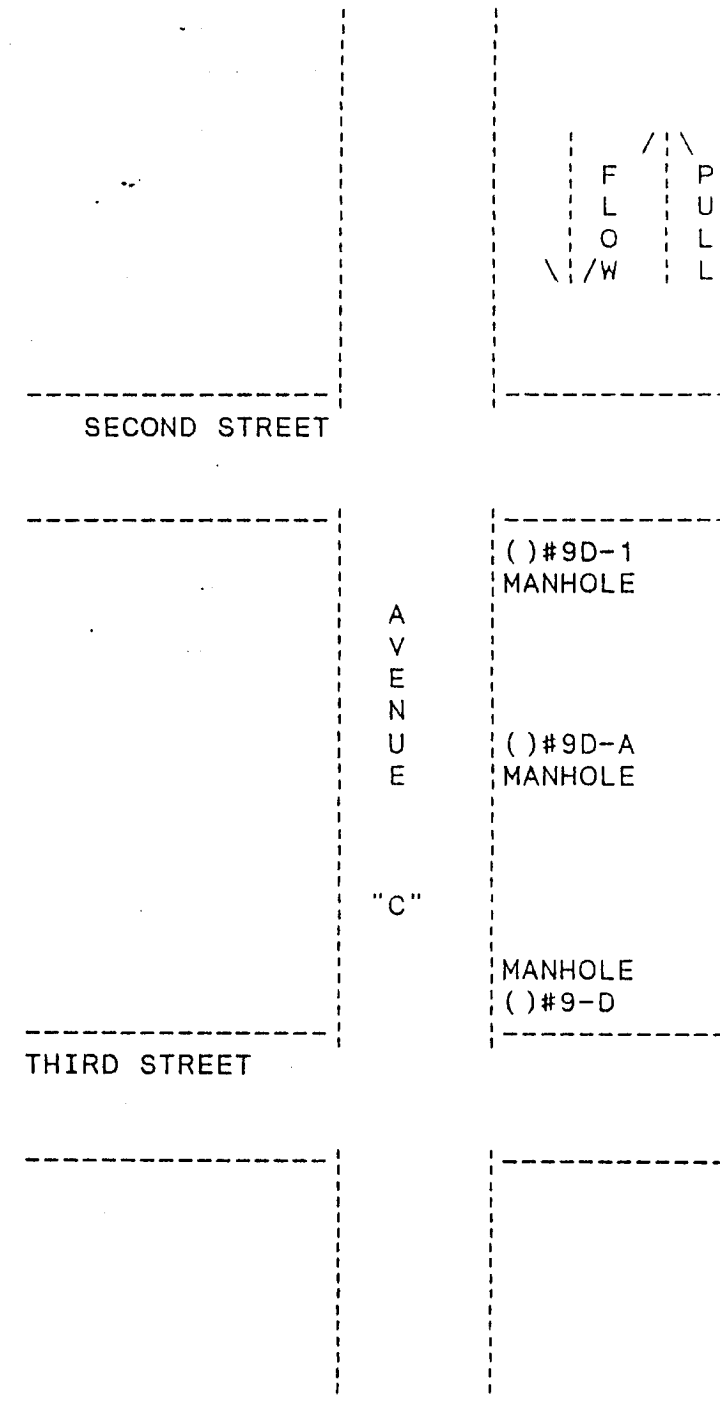
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 6

PIPE CONDITION: FAIR
COULD NOT PASS 32' DUE TO DEBRIS.

GRADE: POOR

REMARKS: _____



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Client A N WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL					X	72.0
MANHOLE #9D-A (NOT ON PLANS)						111.0
LATERAL				X	X	123.0
LATERAL					X	200.0
LATERAL					X	227.0
LATERAL				X	X	263.0
MANHOLE #9D-1						324.0
END OF RUN						

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RECEIVED
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CLIENT: A. N. WEST

DATE: OCTOBER 30, 1990 RUN NO: 32

PIPE SIZE: 15" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 5.5'

STREET: N/A AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #8D-1
TO MANHOLE #8-D

OPERATOR: ROB MAGOWAN

TOTAL RUN: 93.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

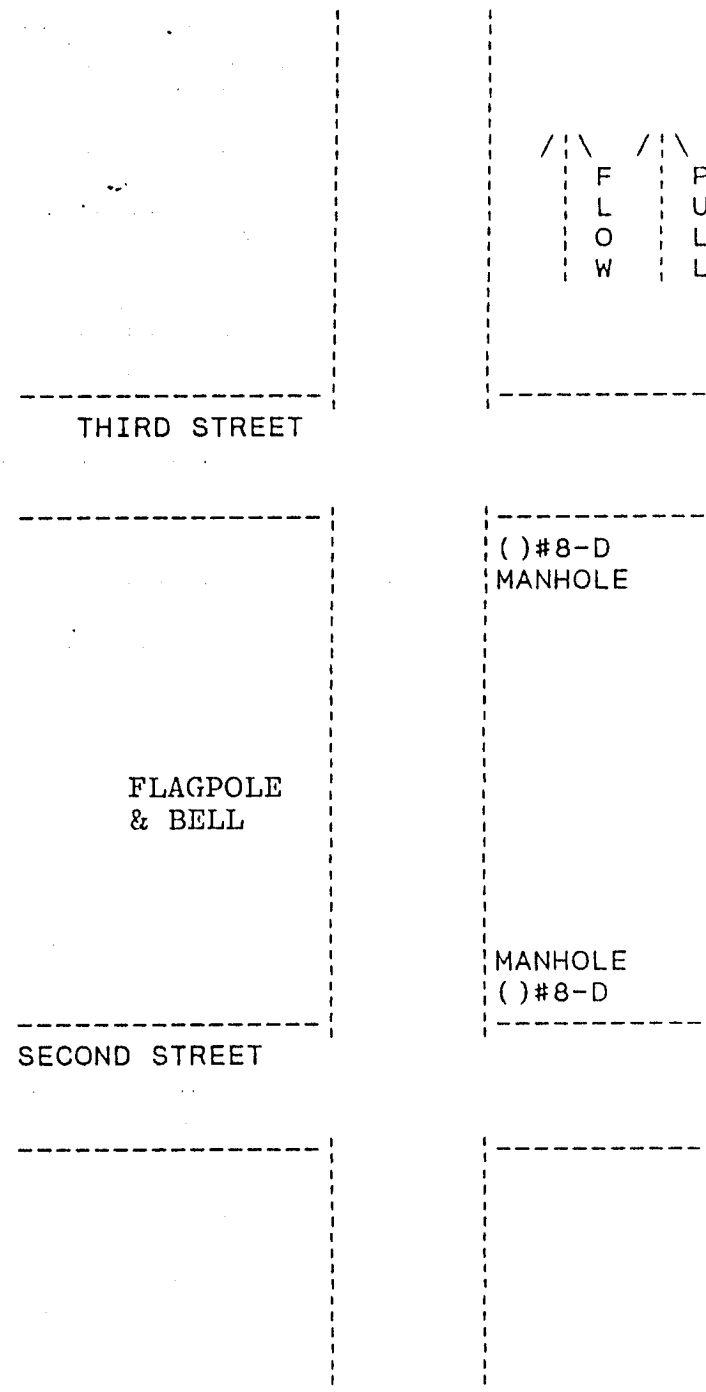
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 6

PIPE CONDITION: GOOD - WHAT WAS OBSERVED
COULD NOT PASS 32' DUE TO DEBRIS.

GRADE: POOR

REMARKS: HEAD LIGHTS KEEP BLOWING
OUT DUE TO OILY WATER.



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Client A N WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
DIP IN GRADE						0.0 TO 82.0
END OF RUN DUE TO BLOWN HEADLIGHT						93.0

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RECEIVED
NOV - 8 1990

CLIENT: A N WEST

DATE: NOVEMBER 1, 1990 RUN NO: 33

PIPE SIZE: 12" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 3'

STREET: PARKING LOT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN 2E1B TO CATCH BASIN #B1A

OPERATOR: ROB MAGOWAN

TOTAL RUN: 99.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

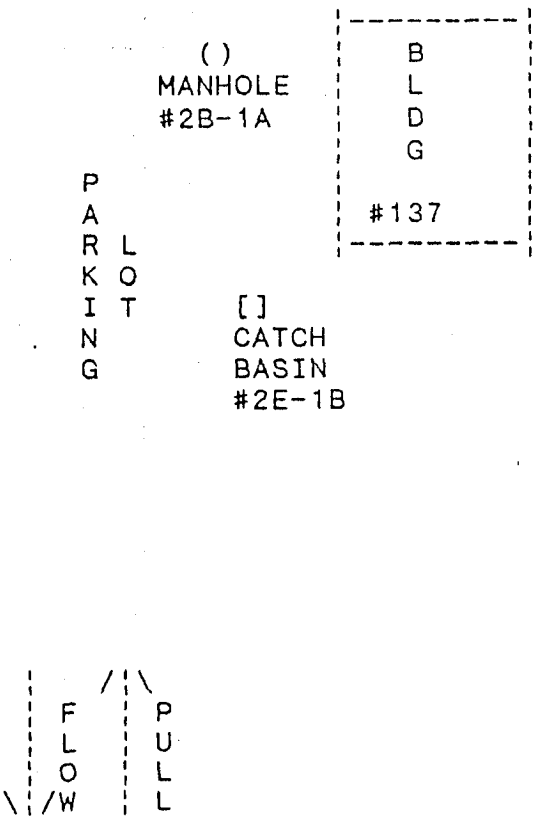
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 6

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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Client A N WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X			X	33.5
LATERAL		X				59.5
CATCH BASIN						99.0
END OF RUN	--					

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Pacific Pipeline Survey

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CLIENT: A N WEST

DATE: NOVEMBER 1, 1990 RUN NO: 34

PIPE SIZE: 12" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 3'

STREET: PARKING LOT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #2E-1B TO MANHOLE #2E-1

OPERATOR: ROB MAGOWAN

TOTAL RUN: 163.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 7

PIPE CONDITION: POOR - BREAKS AND VOIDS AS NOTED.

GRADE: GOOD

REMARKS: BREAKS THROUGHOUT LINE COULD NOT PASS LATERAL AT 163.0'

/ \ / \
FLOW PULL

AVENUE "A"

BUILDING

( ) MANHOLE #2E-1

( ) CATCH BASIN #2E-1B

FIFTH STREET

Run 34 Page 1

Client A N WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
BREAK						17.0
BREAK. VOID IN TOP OF PIPE						53.0
BREAK						81.0 TO 97.0
LATERAL - PROTRUDING 4"	--				X	97.0
BREAK						100.0 TO 115.0
LATERAL - PROTRUDING 5"/HOLE IN TOP OF PIPE					X	163.0
LATERAL - PROTRUDING						163.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 1, 1990 RUN NO: 35

PIPE SIZE: 30" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 10'

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #4-E TO MATERIAL AT 87.5'

OPERATOR: ROB MAGOWAN

TOTAL RUN: 87.5'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

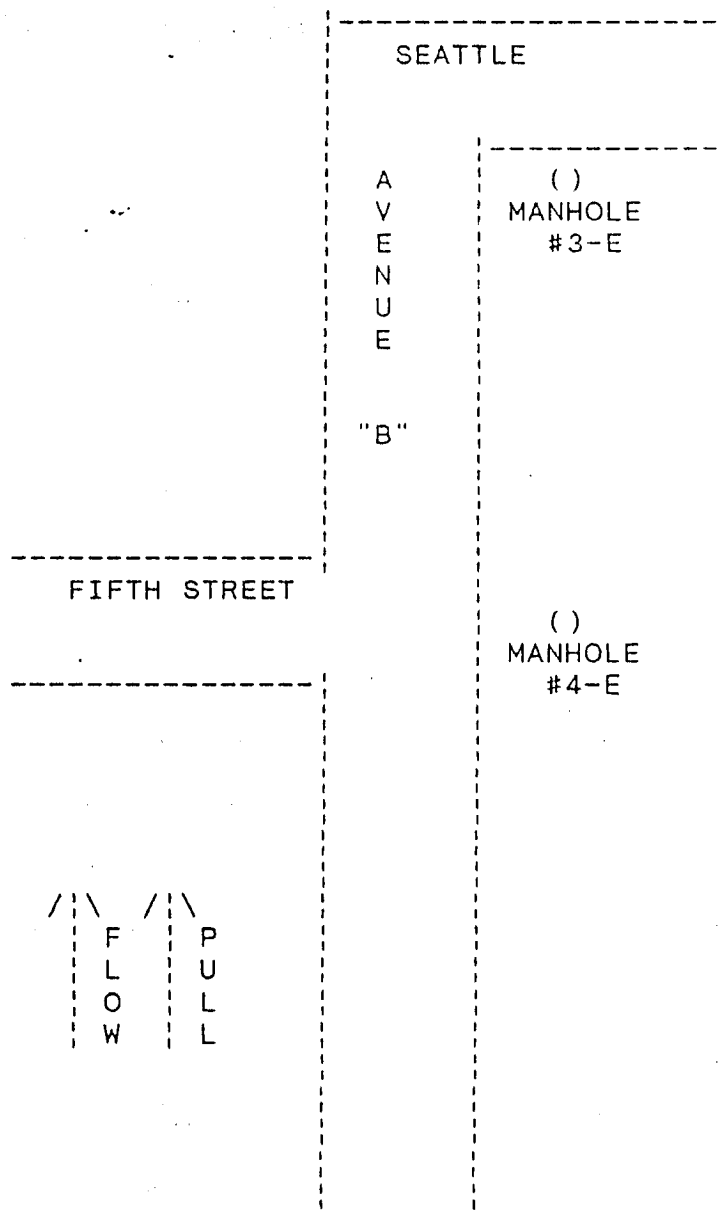
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 7

PIPE CONDITION: FAIR - WHAT WAS OBSERVED

GRADE: GOOD

REMARKS: _____



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Client A N WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
COULD NOT PASS MATERIAL						87.5
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 2, 1990 RUN NO: 36

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 7'

STREET: AVENUE "H" AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #3-G1
THRU CATCH BASIN TO MANHOLE #3-G

OPERATOR: ROB MAGOWAN

TOTAL RUN: 475.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

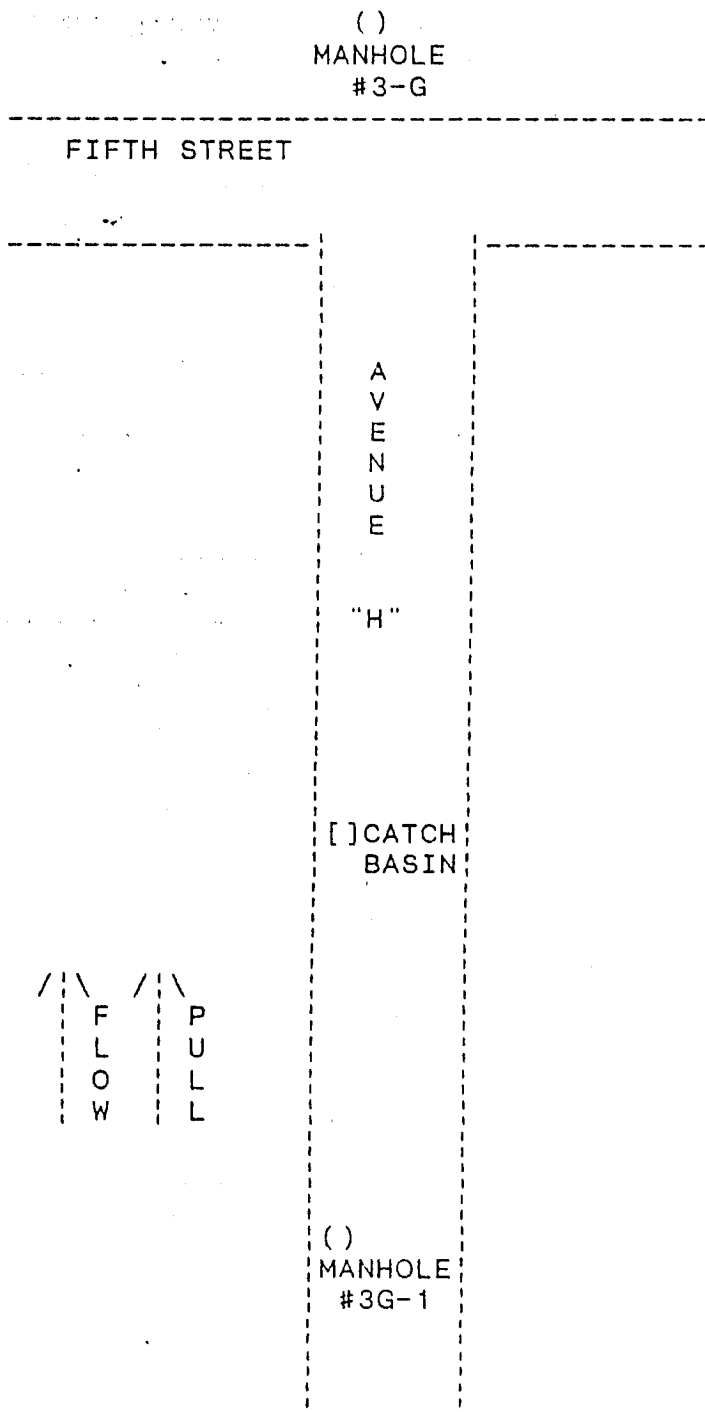
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 7

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



Run 36 Page 1

Client A N WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN WITH LATERAL PROTRUDING 1 1/2"		X			X	135.0
LATERAL		X				139.0
LATERAL		X			X	209.0
LATERAL	--	X			X	231.0
LATERAL		X				261.0
LATERAL		X				380.0
LATERAL				X	X	410.0
BREAK						416.0
MANHOLE #3-G						475.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 2, 1990 RUN NO: 37

PIPE SIZE: 8"/12" PIPE TYPE: POLY SLIPLINER

JOINT LENGTH: 40' APPROX MH DEPTH: 3'

STREET: ATLANTIC AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #2-G2 THRU MANHOLE #2-G1 TO MANHOLE #2-G1A TO MANHOLE #2-G

OPERATOR: ROB MAGOWAN

TOTAL RUN: 525.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

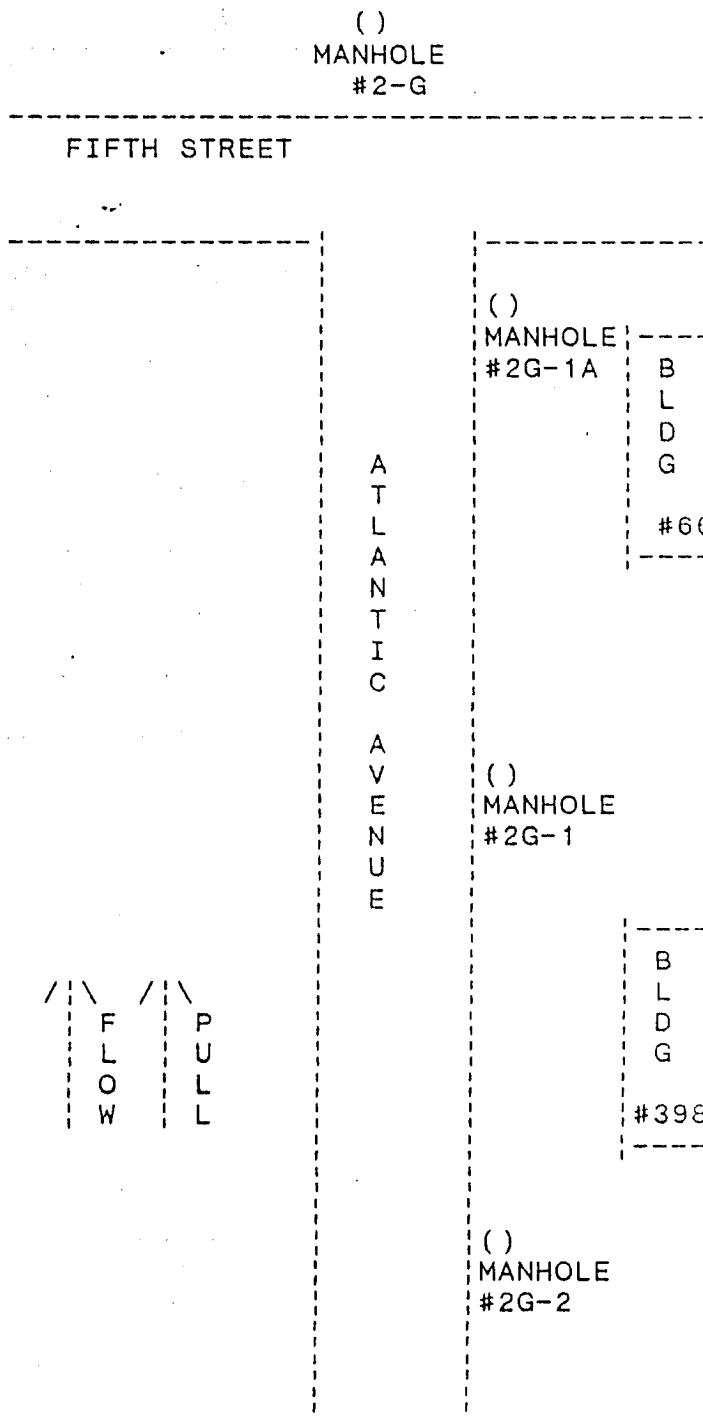
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 7

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: MANHOLE #2G1-A NOT ON PLANS



Run 37 Page 1

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X			X	91.5
LATERAL		X	X			176.0
LATERAL				X	X	216.5
MANHOLE #2G-1						294.0
PIPE OUT OF ROUND/PIPE CHANGES TO 12"						320.0
MANHOLE #2G-1A						476.0
MANHOLE #2-G						525.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 5, 1990 RUN NO: 38

PIPE SIZE: 36" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 10'

STREET: ATLANTIC AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #8-H
THRU MANHOLE #7-H TO MANHOLE #6-H

OPERATOR: ROB MAGOWAN

TOTAL RUN: 812.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

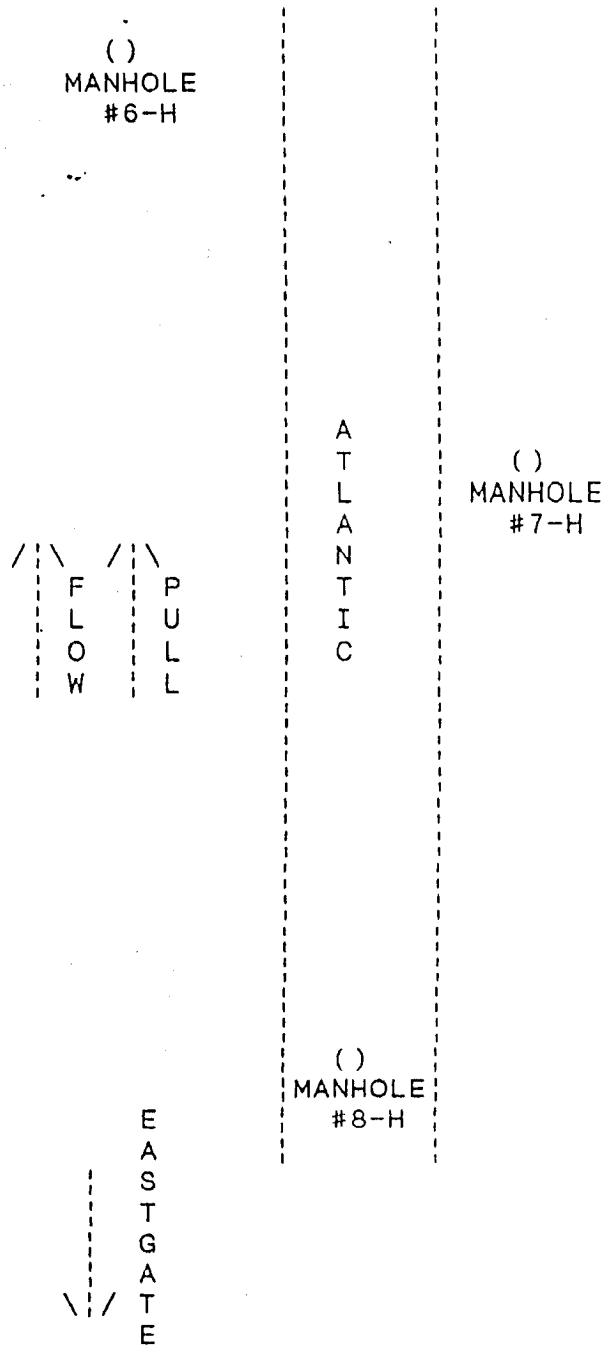
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 7

PIPE CONDITION: GOOD - WITH NOTED
EXCEPTIONS.

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL					X	34.0
LATERAL		X				205.0
MANHOLE #7H						401.0
LATERAL		X			X	717.0
JOINT INFILTRATION						794.0
JOINT INFILTRATION						798.0
MANHOLE #6H						812.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 5, 1990 RUN NO: 39

PIPE SIZE: 24" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 10'

STREET: 5TH STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #7-G
THRU MANHOLE #6-G TO MANHOLE #5-G

OPERATOR: ROB MAGOWAN

TOTAL RUN: 665.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

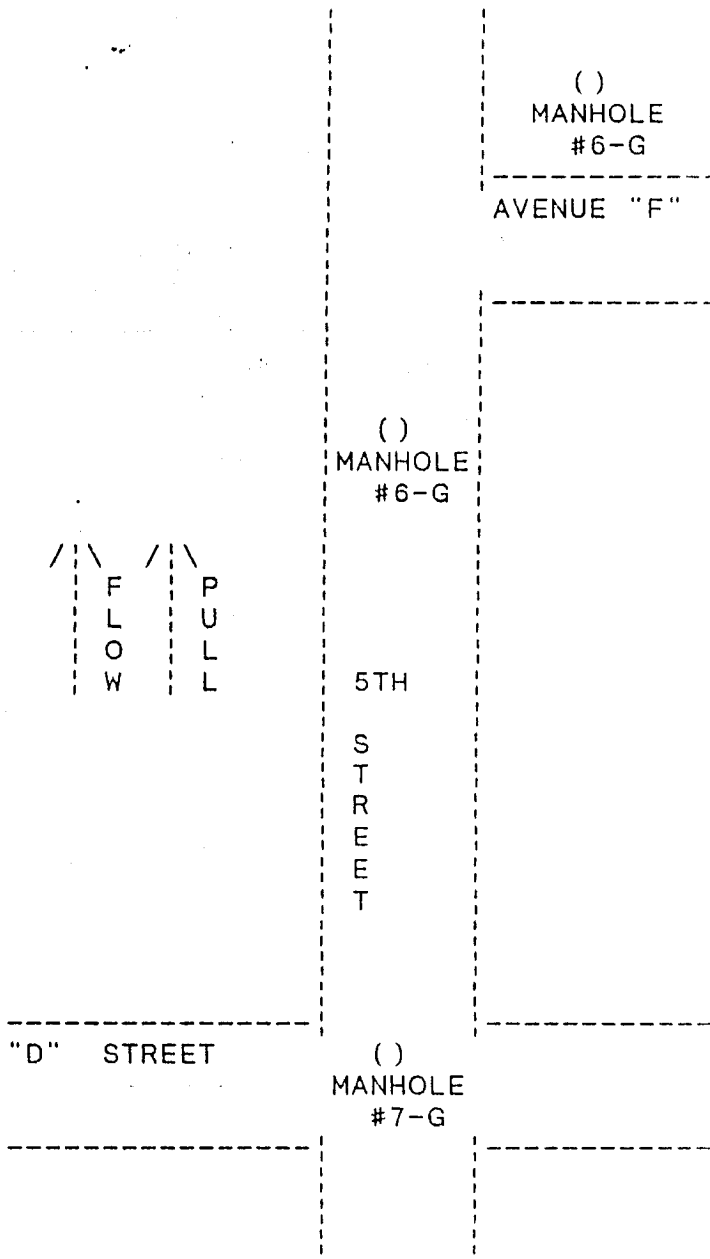
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 9

PIPE CONDITION: GOOD

GRADE: FAIR TO GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL - PROTRUDING 4"		X				214.0
LATERAL - PROTRUDING 4"					X	254.0
MANHOLE #6G (PIPE CHANGES TO 30")						347.0
LATERAL	--				X	409.0
LATERAL		X				425.0
LATERAL		X			X	505.0
LATERAL					X	518.0
LATERAL		X			X	532.0
JOINT INFILTRATION						640.0
MANHOLE #5G						665.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 5, 1990 RUN NO: 40

PIPE SIZE: 4" PIPE TYPE: PVC

JOINT LENGTH: 20' APPROX MH DEPTH: 3'

STREET: EASEMENT & ATLANTIC AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #6HA TO CATCH BASIN #6HB

OPERATOR: KEN GANK

TOTAL RUN: 18.5'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

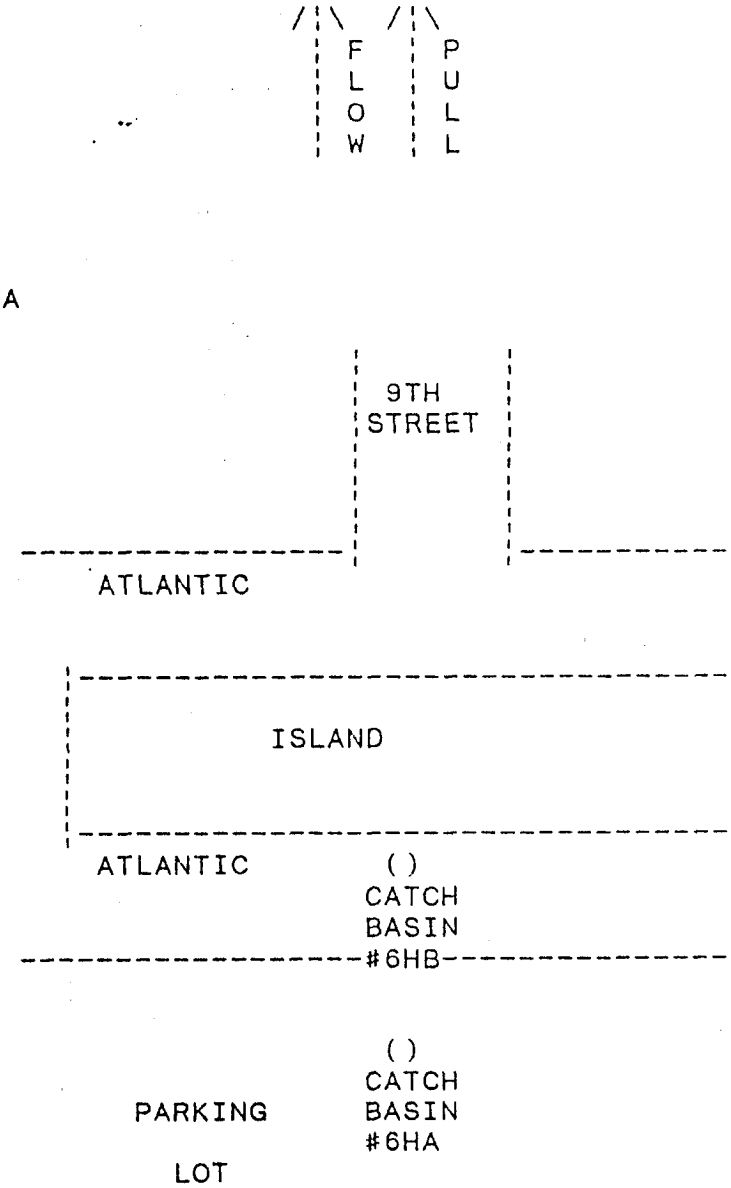
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN 6HB						18.5
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 5, 1990 RUN NO: 42

PIPE SIZE: 8" PIPE TYPE: PVC

JOINT LENGTH: 6' APPROX MH DEPTH: 3'

STREET: EASEMENT & ATLANTIC AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #6BH TO MAINLINE STORM

OPERATOR: KEN GANK

TOTAL RUN: 8.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

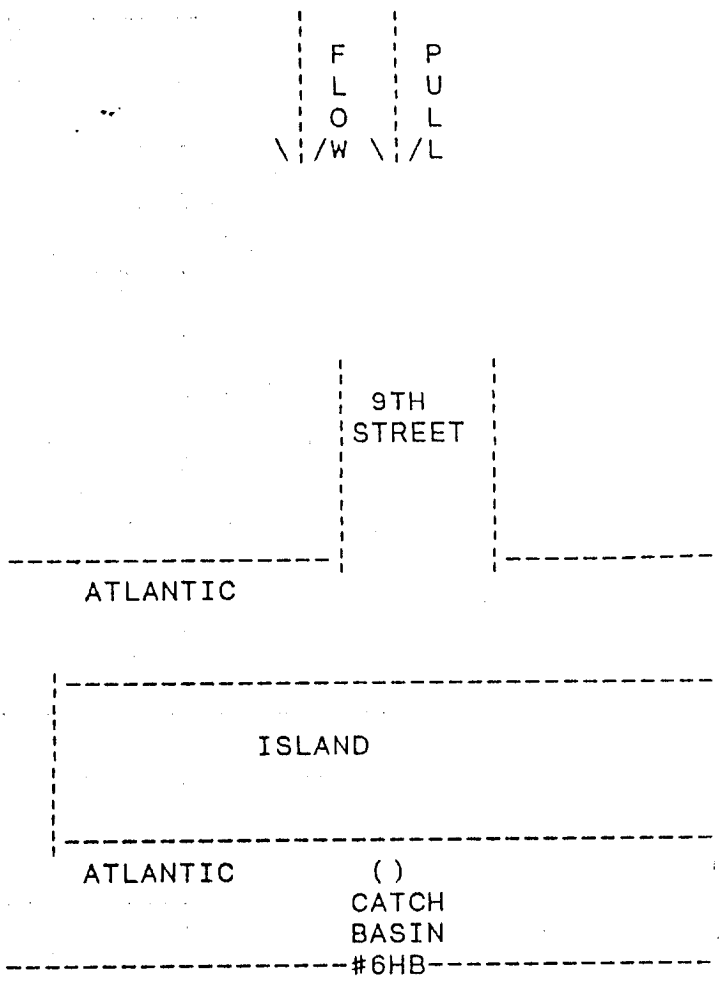
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
MAINLINE STORM						8.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 5, 1990 RUN NO: 43

PIPE SIZE: 6" PIPE TYPE: PVC

JOINT LENGTH: 20' APPROX MH DEPTH: 2'

STREET: ATLANTIC & EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #6HD TO MAINLINE STORM

OPERATOR: KEN GANK

TOTAL RUN: 47.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

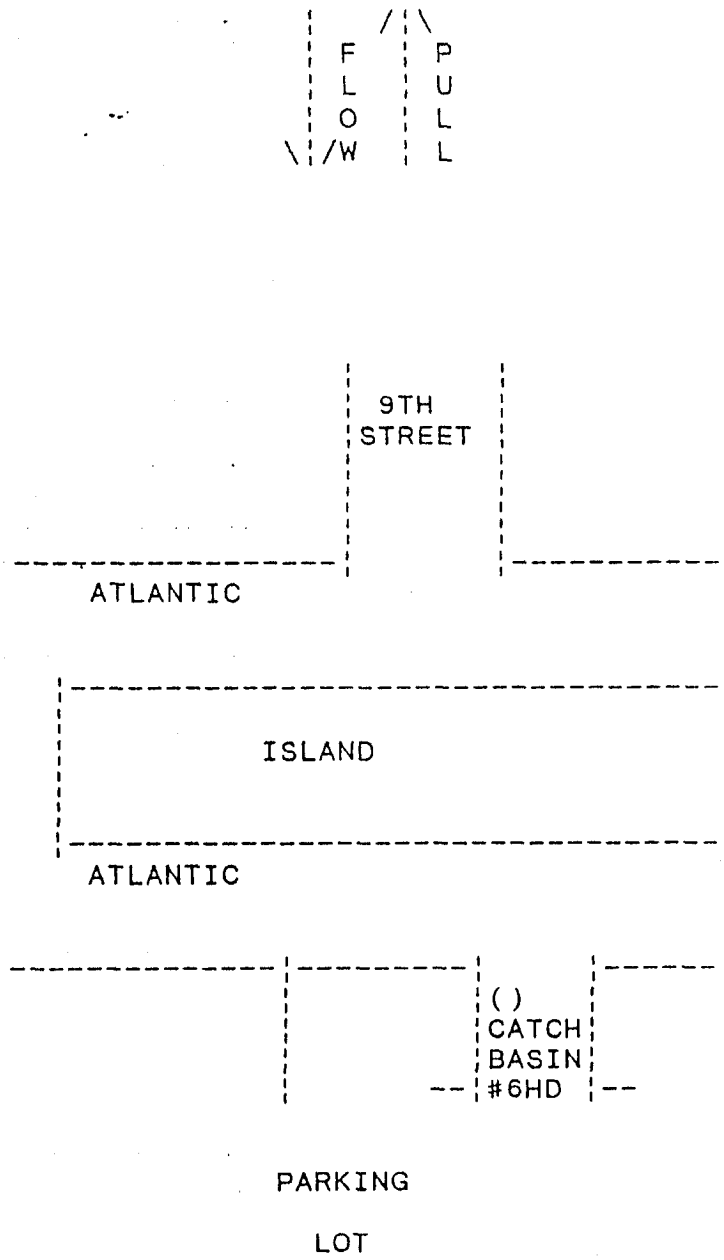
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
MAINLINE STORM						47.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 5, 1990 RUN NO: 44

PIPE SIZE: 10" PIPE TYPE: CMP

JOINT LENGTH: 10' APPROX MH DEPTH: 3'

STREET: ATLANTIC & EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #7HA TO CATCH BASIN #7HB

OPERATOR: KEN GANK

TOTAL RUN: 25.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

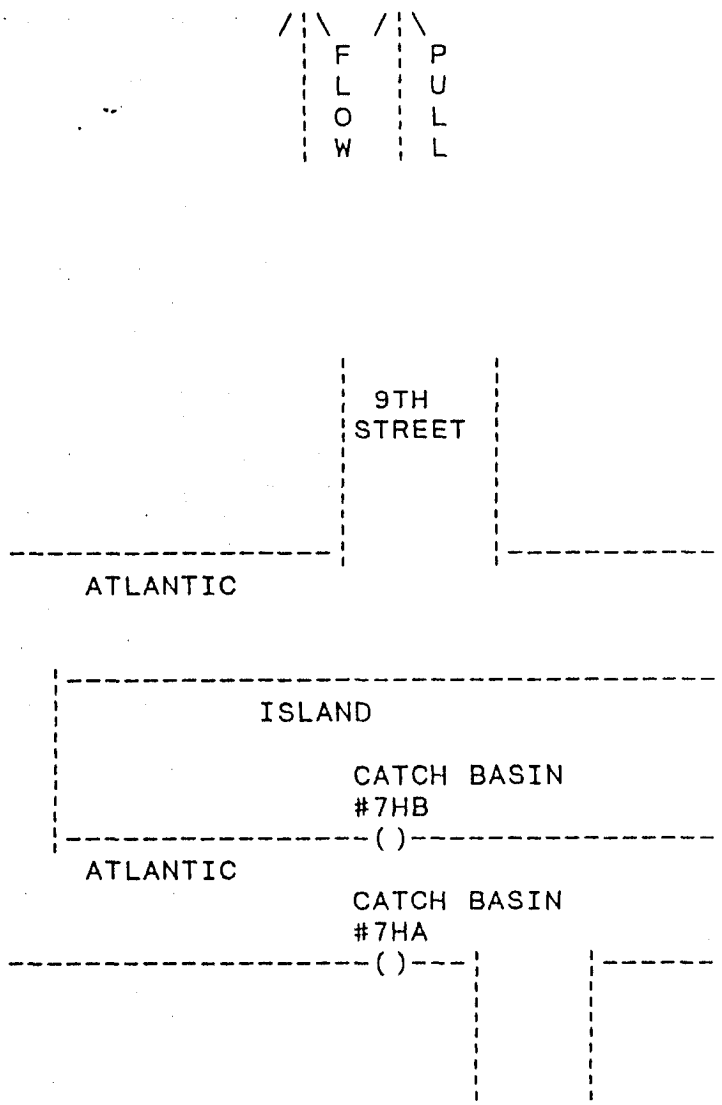
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: FAIR

GRADE: FAIR

REMARKS: DEBRIS THROUGHOUT



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN #7HB						25.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 5, 1990 RUN NO: 45

PIPE SIZE: 10" PIPE TYPE: CMP

JOINT LENGTH: 10' APPROX MH DEPTH: 12'

STREET: ATLANTIC & EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #7H TO CATCH BASIN #7HB

OPERATOR: KEN GANK

TOTAL RUN: 25.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

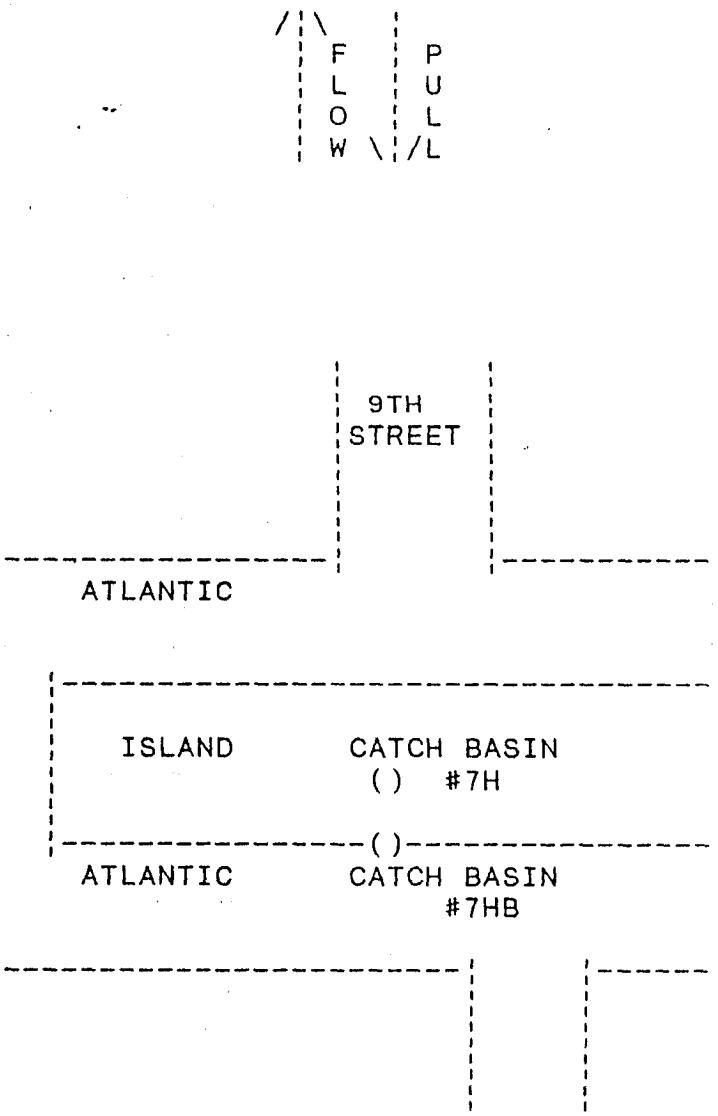
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: FAIR

GRADE: FAIR - LAST 8'

REMARKS: DEBRIS THROUGHOUT



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Client A N WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN #7HB						25.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 5, 1990 RUN NO: 46

PIPE SIZE: 6" PIPE TYPE: D.I.

JOINT LENGTH: 20' APPROX MH DEPTH: 12'

STREET: 9TH STREET & "G" STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #6H4
TO CATCH BASIN #6H4A

OPERATOR: KEN GANK

TOTAL RUN: 50.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

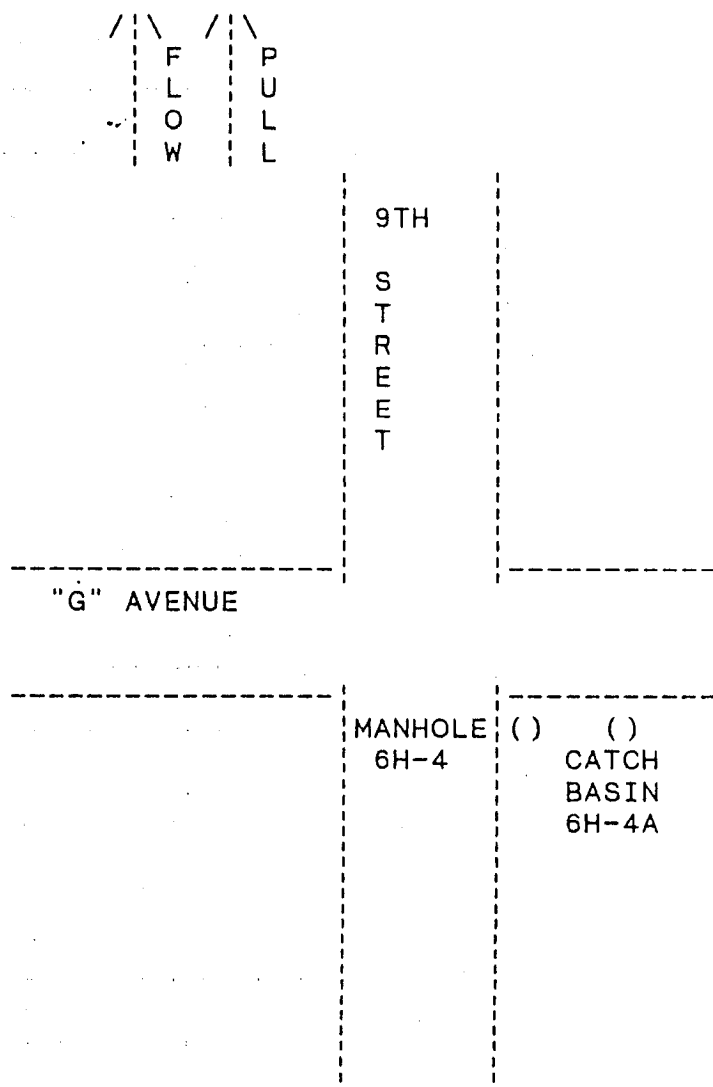
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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Client A N WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN #6H-4A						50.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 7, 1990 RUN NO: 49

PIPE SIZE: 10" PIPE TYPE: CEMENT

JOINT LENGTH: 7' APPROX MH DEPTH: 3'

STREET: "F" STREET UNDER AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #5G-6 TO CATCH BASIN #5G-6A

OPERATOR: KEN GANK

OTAL RUN: 36.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

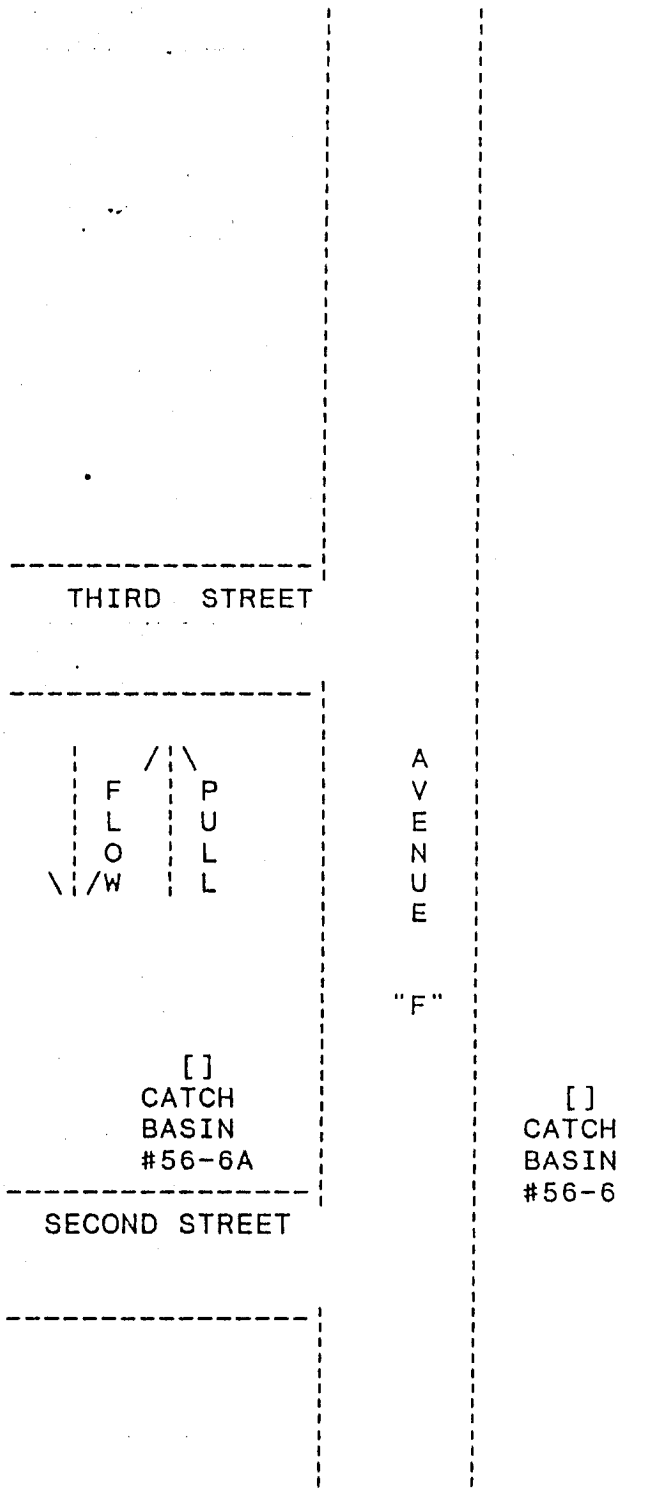
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: GOOD

GRADE: FAIR

REMARKS: DEBRIS THROUGHOUT



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN 5G-6						36.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 6, 1990 RUN NO: 50

PIPE SIZE: 21" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 8'

STREET: AVENUE "C" AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #10D TO MANHOLE #9D

OPERATOR: ROB MAGOWAN

TOTAL RUN: 240.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

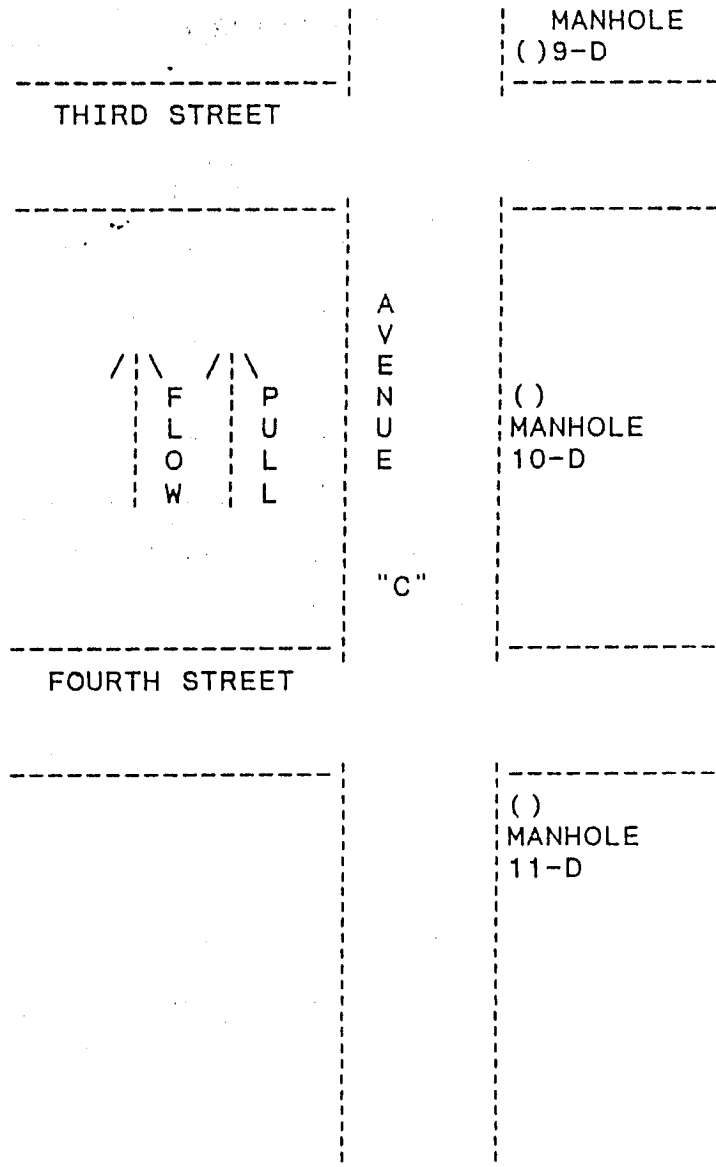
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 9

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: EXCESS MATERIAL AND WATER FROM MANHOLE 11-D TO MANHOLE 10-D COULD NOT PULL IT DOWN.



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL - PROTRUDING 4"		X				85.0
LATERAL		X				118.5
LATERAL		X				137.0
MANHOLE #9-D						240.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 6, 1990 RUN NO: 51

PIPE SIZE: 15" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 4'

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #566
TO MANHOLE #565

OPERATOR: ROB MAGOWAN

TOTAL RUN: 314.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

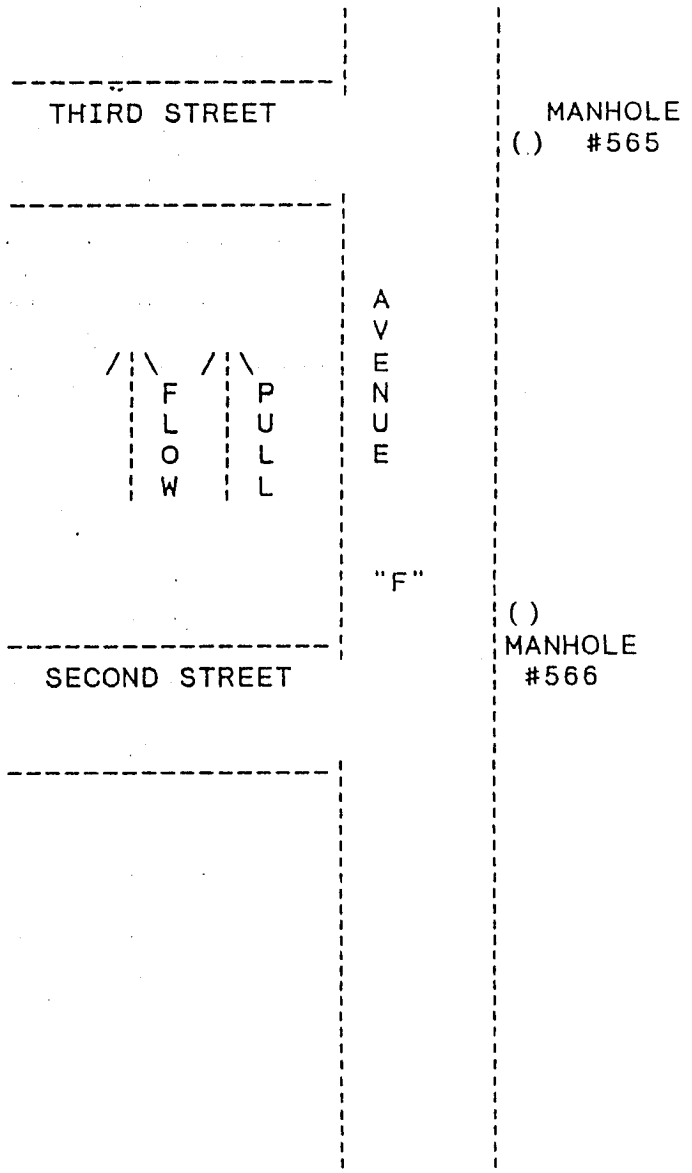
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 9

PIPE CONDITION: GOOD

GRADE: FAIR TO GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL					X	15.5
LATERAL					X	43.0
LATERAL					X	52.5
LATERAL		X			X	67.0
LATERAL					X	83.0
LATERAL					X	124.0
LATERAL					X	135.0
LATERAL					X	165.0
LATERAL					X	204.0
LATERAL					X	224.0
LATERAL					X	245.0
LATERAL		X			X	261.0
MANHOLE #565						314.0
END OF RUN						/XQ

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CLIENT: A N WEST

DATE: NOVEMBER 7, 1990 RUN NO: 52

PIPE SIZE: 12" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 3'

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #3G-1A TO CANHPOLE #3G-1

OPERATOR: ROB MAGOWAN

TOTAL RUN: 108.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

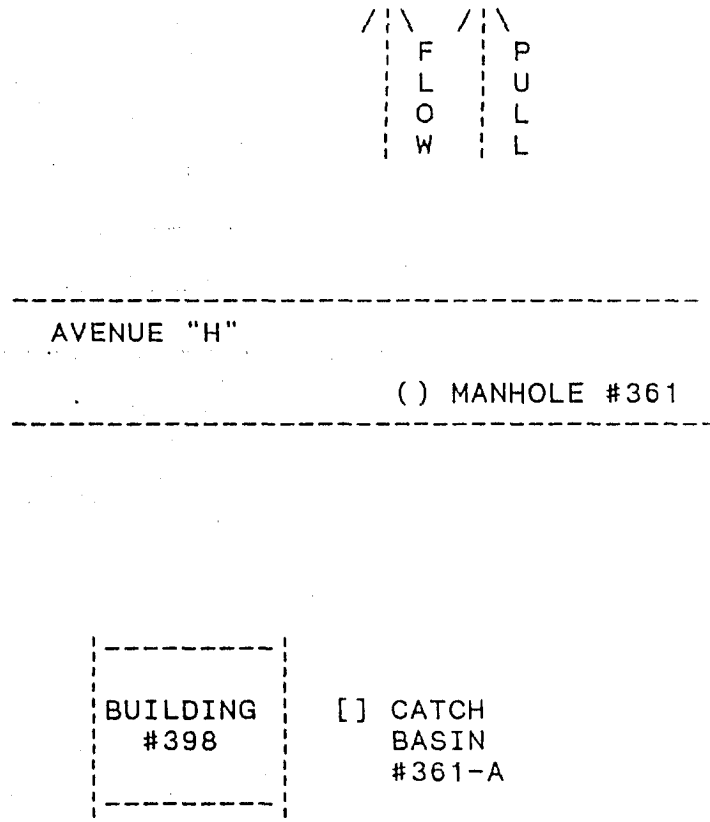
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 9

PIPE CONDITION: GOOD - EXCEPT AS NOTED

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X	X			21.0
BREAK - RADIAL						23.0
MANHOLE 3G-1						108.0
END OF RUN						

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RECEIVED
NOV 1 3 1990

CLIENT: A N WEST

DATE: NOVEMBER 7, 1990 RUN NO: 53

PIPE SIZE: 8" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 3.5'

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #3G-1B TO MANHOLE #3G-1

OPERATOR: ROB MAGOWAN

TOTAL RUN: 153.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

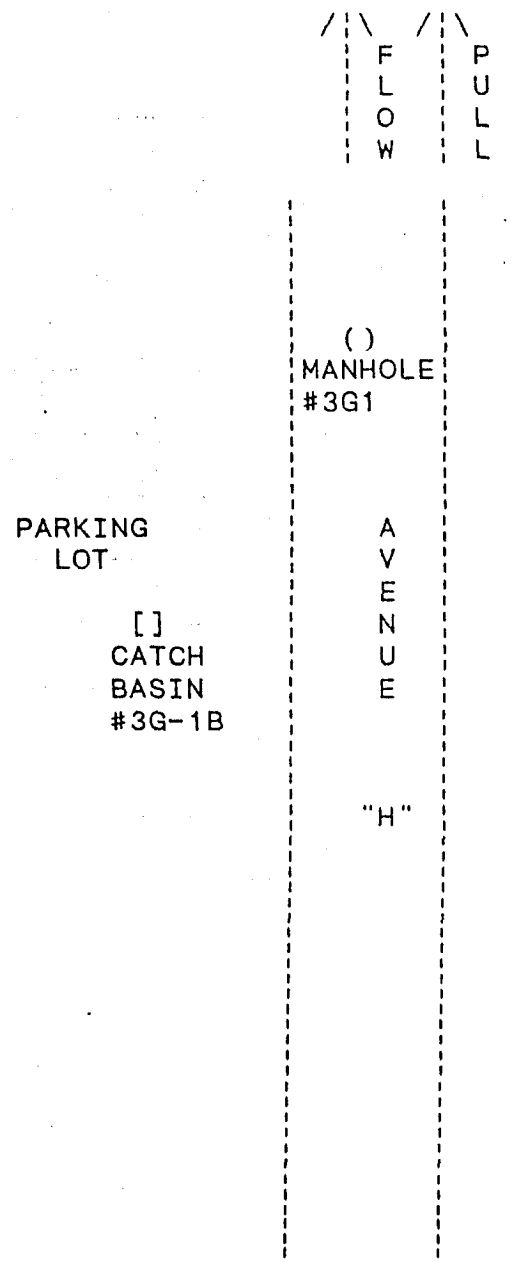
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 9

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



Run 53 Page 1

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
MANHOLE 3G-1						153.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 7, 1990 RUN NO: 54

PIPE SIZE: 8" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 5'

STREET: AVENUE "H" AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #3G-1C TO MANHPOLE #3G-1

OPERATOR: ROB MAGOWAN

TOTAL RUN: 33.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

CHEMICALS USED: _____

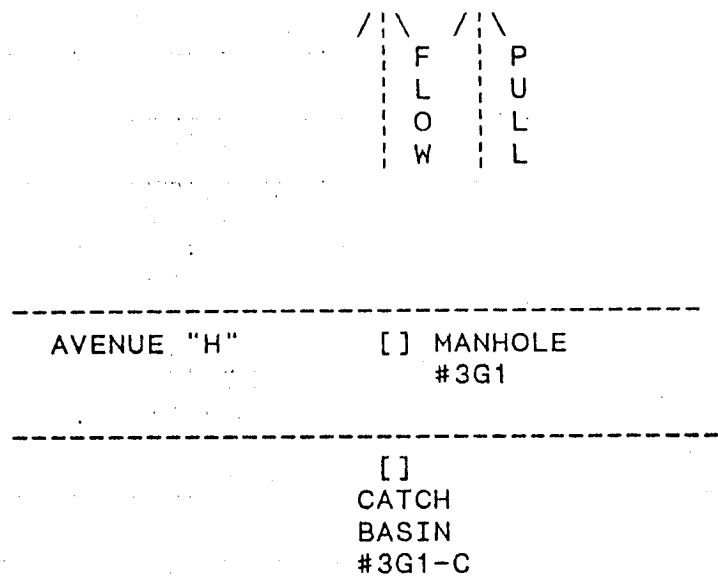
PHOTOS TAKEN: _____ VIDEO TAPES: 9

PIPE CONDITION: GOOD - EXCEPT AS NOTED

EXCEPTIONS

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
BREAK - LONGITUDINAL AT TOP						24.0 TO 26.0
BREAK - SPIRAL						29.0 TO 30.5
MANHOLE 3G-1						33.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 8, 1990 RUN NO: 55

PIPE SIZE: 12" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 5.5'

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #6G20-A TO CATCH BASIN #6G20-B

OPERATOR: ROB MAGOWAN

TOTAL RUN: 98.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

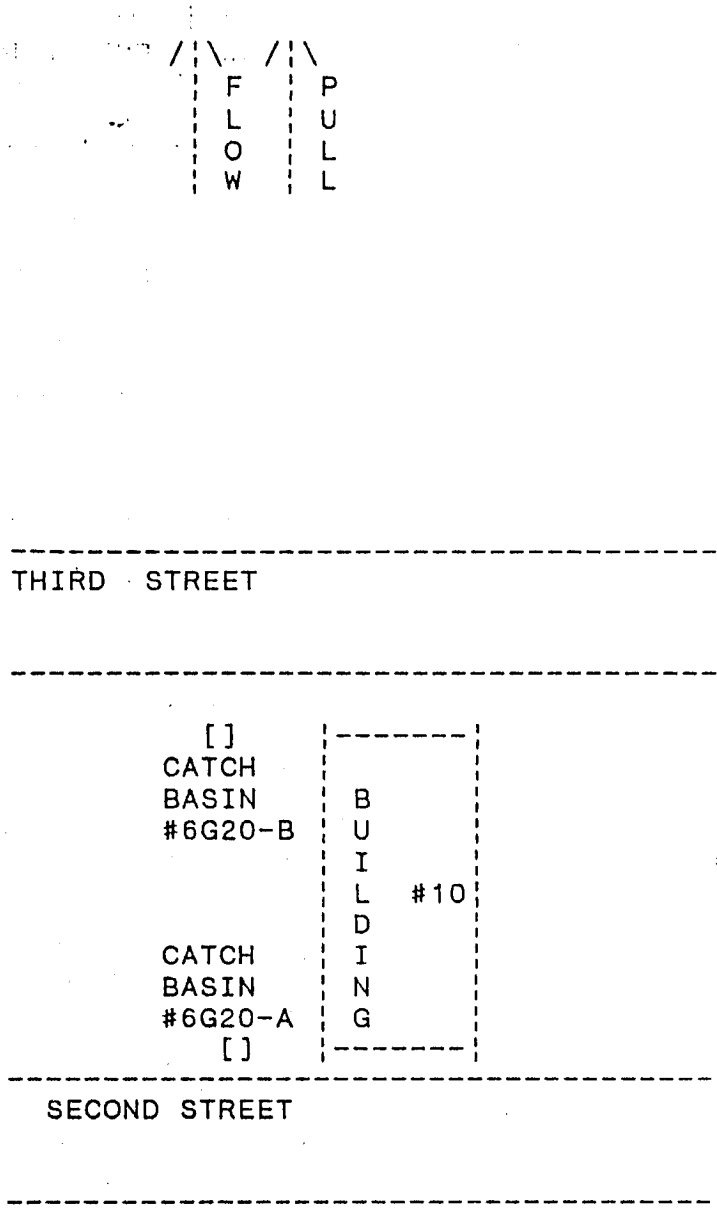
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 9

PIPE CONDITION: POOR - WITH NOTED MATERIAL IN LINE AND BUILDUP ON PIPE.

GRADE: POOR

REMARKS: CAMERA WOULD NOT PASS 98.0' DUE TO MATERIAL.



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CAMERA UNDERWATER						45.0 TO 54.0
LATERAL		X			X	67.0
CAMERA WILL NOT PASS - END OF RUN						98.0

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CLIENT: A N WEST

DATE: NOVEMBER 8, 1990 RUN NO: 56

PIPE SIZE: 15" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 6'

STREET: THIRD STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #6G20-B TO CATCH BASIN #6G20

OPERATOR: ROB MAGOWAN

TOTAL RUN: 108.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

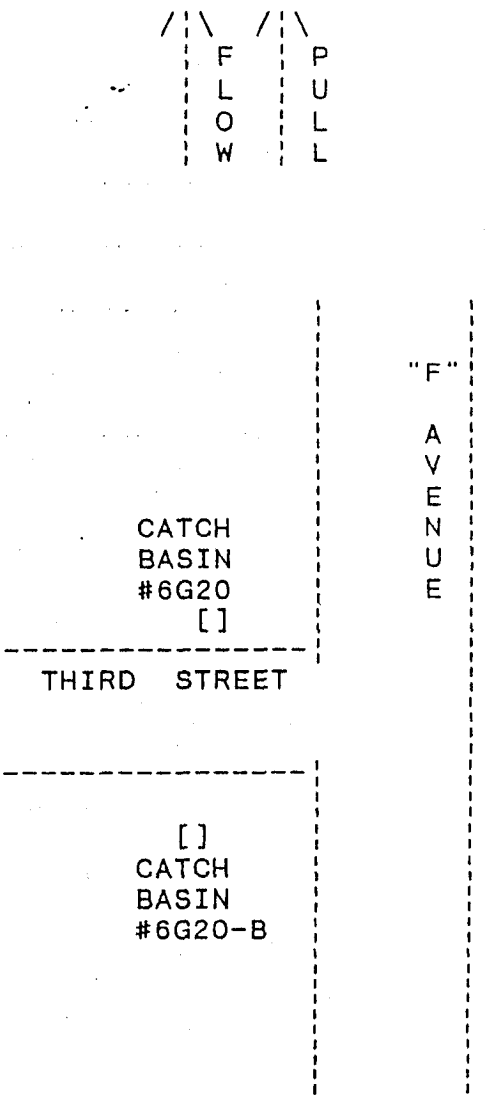
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 9

PIPE CONDITION: POOR - WITH NOTED MATERIAL IN LINE

GRADE: POOR

REMARKS: _____



Run 55 Page 1

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL					X	33.5
MANHOLE #6G20						108.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 8, 1990 RUN NO: 57

PIPE SIZE: 15" PIPE TYPE: CEMENT

JOINT LENGTH: 4' APPROX MH DEPTH: 5'

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM MANHOLE #8D1 TO MANHOLE #8D

OPERATOR: ROB MAGOWAN

TOTAL RUN: 328.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

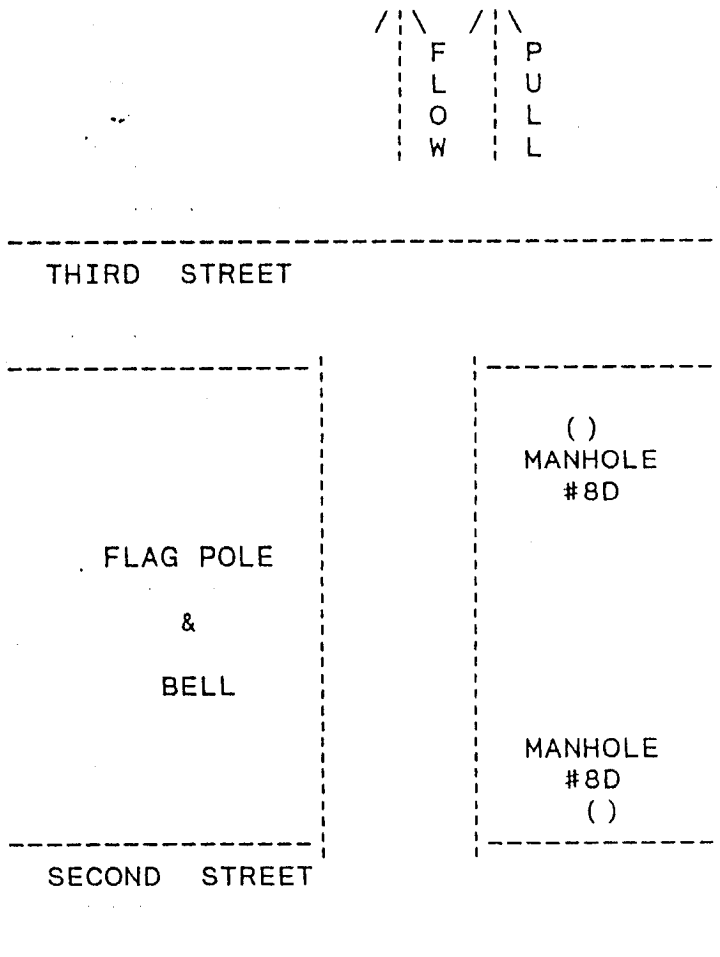
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 10

PIPE CONDITION: GOOD

GRADE: POOR - FIRST 80' DIP IN

REMARKS: GRADE UP TO 7". FAIR THE REMAINDER OF RUN.



Run _____57_____ Page __1_____

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL				X	X	53.0
LATERAL				X	X	119.0
LATERAL				X	X	180.0
ROOTS	1					213.0
LATERAL				X	X	247.0
ROOTS	1					277.0
LATERAL				X	X	302.0
ROOTS	1					307.0
ROOTS	1					313.5
ROOTS	1					316.0
ANHOLE #8D						328.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 58

PIPE SIZE: 8"/10" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 5'

STREET: AVENUE B AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN 4E1-A
THRU CATCH BASIN 4E1-B, #4E1-C, #4E1-D
TO MANHOLE #4E

OPERATOR: ROB MAGOWAN

TOTAL RUN: 77.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

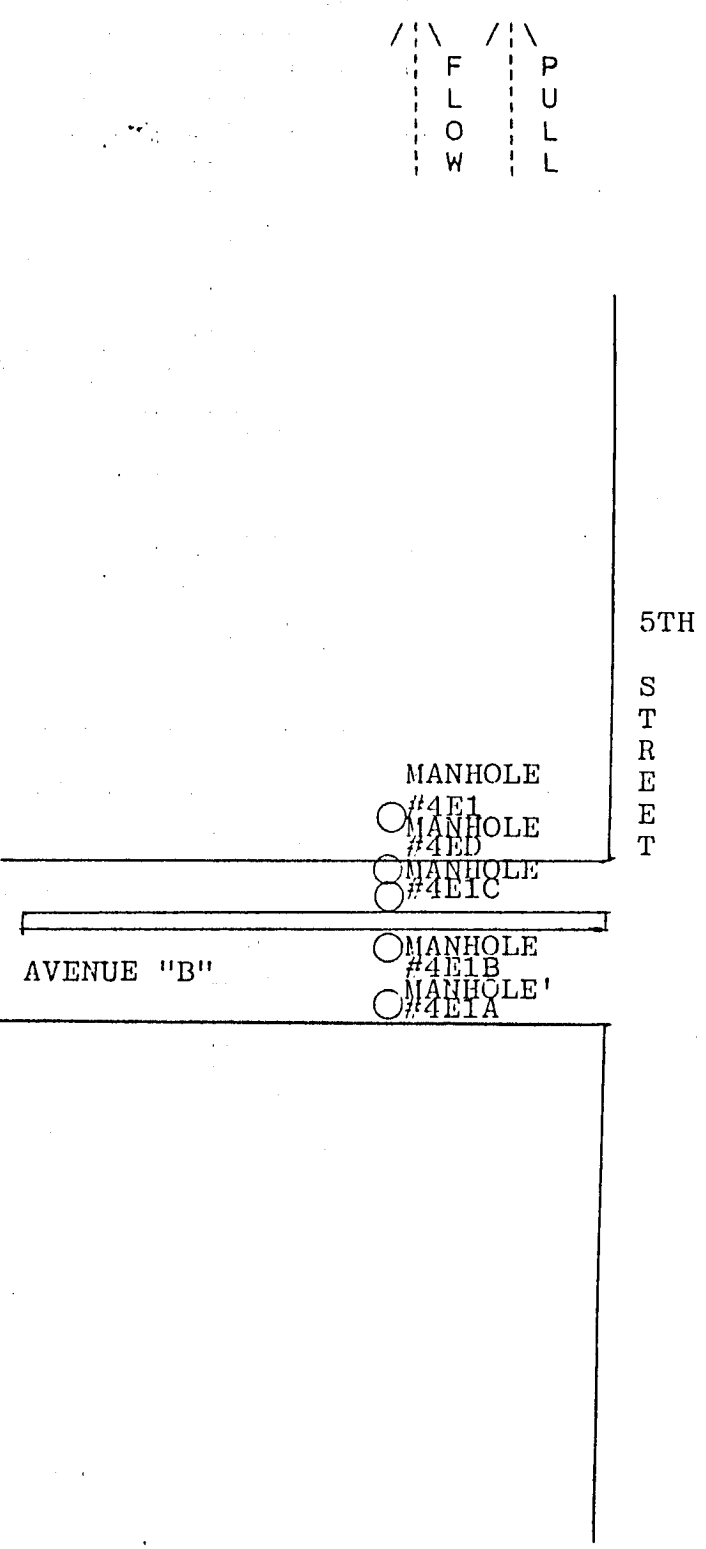
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 10

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN #4E1B						17.5
CATCH BASIN #4E1C						41.0
CATCH BASIN #4E1D						58.5
DIP IN GRADE APPROXIMATELY 5"						68.0 TO 77.0
MANHOLE #4E1						77.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 59

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 5'

STREET: AVENUE B AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN 4E1 TO MANHOLE #4E

OPERATOR: ROB MAGOWAN

TOTAL RUN: 236.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

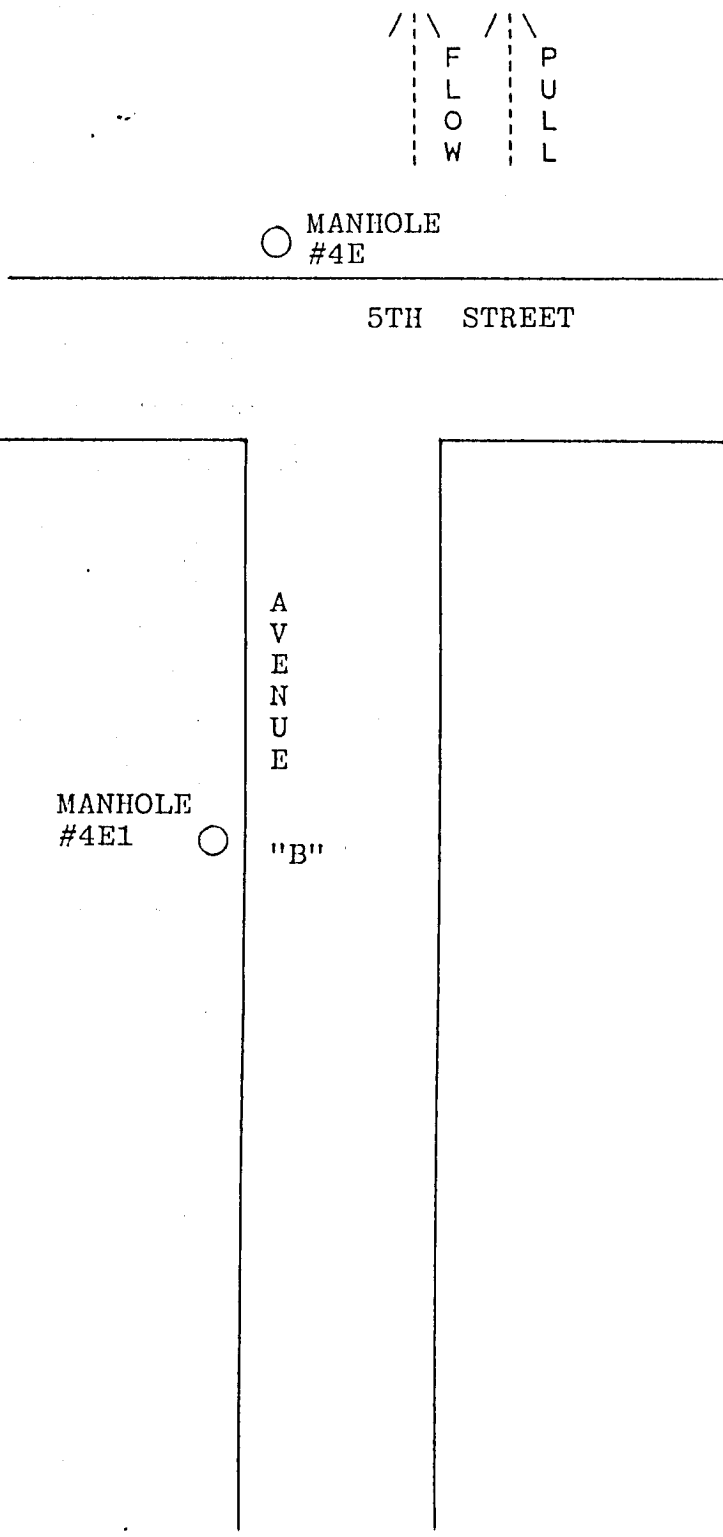
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 10

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X				160.0
MANHOLE #4E						236.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 7, 1990 RUN NO: 60

PIPE SIZE: 10" PIPE TYPE: CEMENT

JOINT LENGTH: _____ APPROX MH DEPTH: 3'

STREET: UNDER "F" STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #5G-4A TOCAATCH BASIN #5G-5

OPERATOR: KEN GANK

TOTAL RUN: 142.0' CAMERA UNDERWATER 6'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

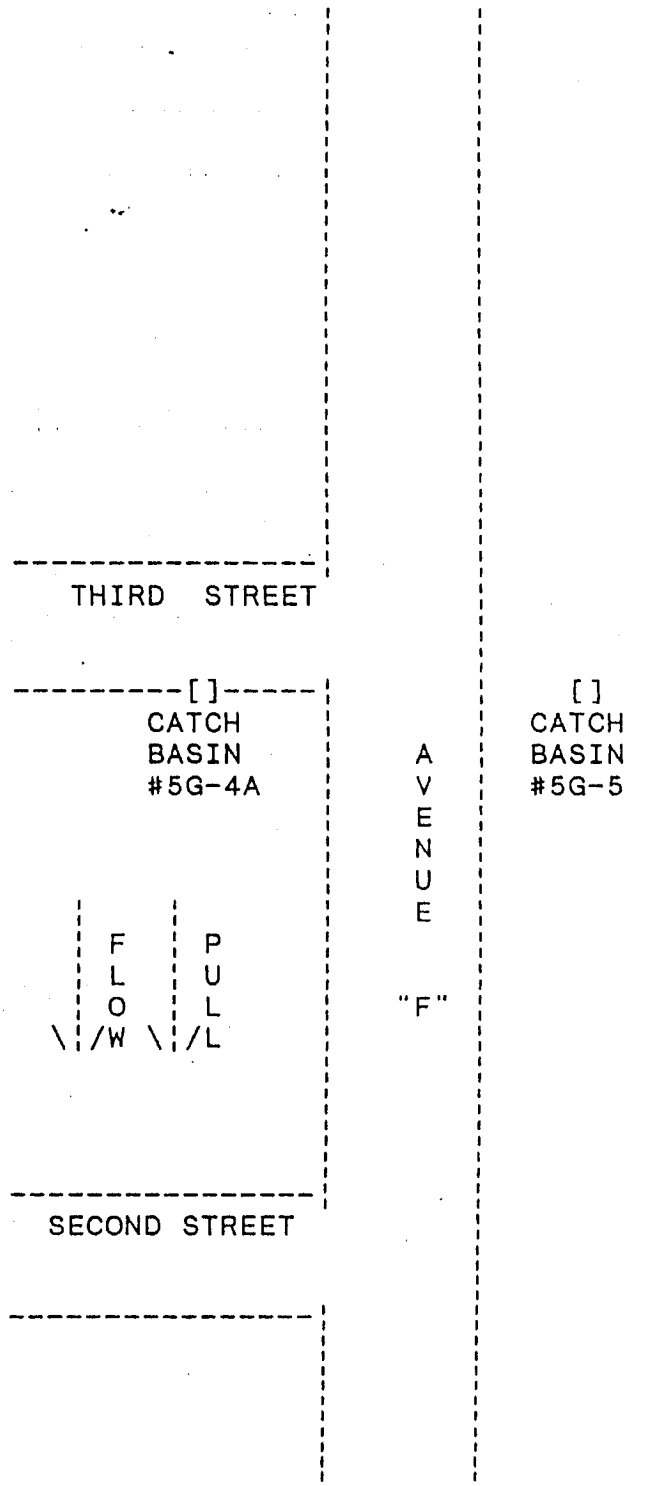
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: GOOD

GRADE: FAIR TO POOR - CAMERA

REMARKS: UNDERWATER TO 6', DEBRIS THROUGHOUT - PULLED CAMERA OUT.



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CAMERA UNDERWATER						2.0 TO 6.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 7, 1990 RUN NO: 61

PIPE SIZE: 15" PIPE TYPE: CEMENT

JOINT LENGTH: _____ APPROX MH DEPTH: 3'

STREET: THIRD STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN

#5G-4A TOCAATCH BASIN #5G-4B

OPERATOR: KEN GANK

TOTAL RUN: 36.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

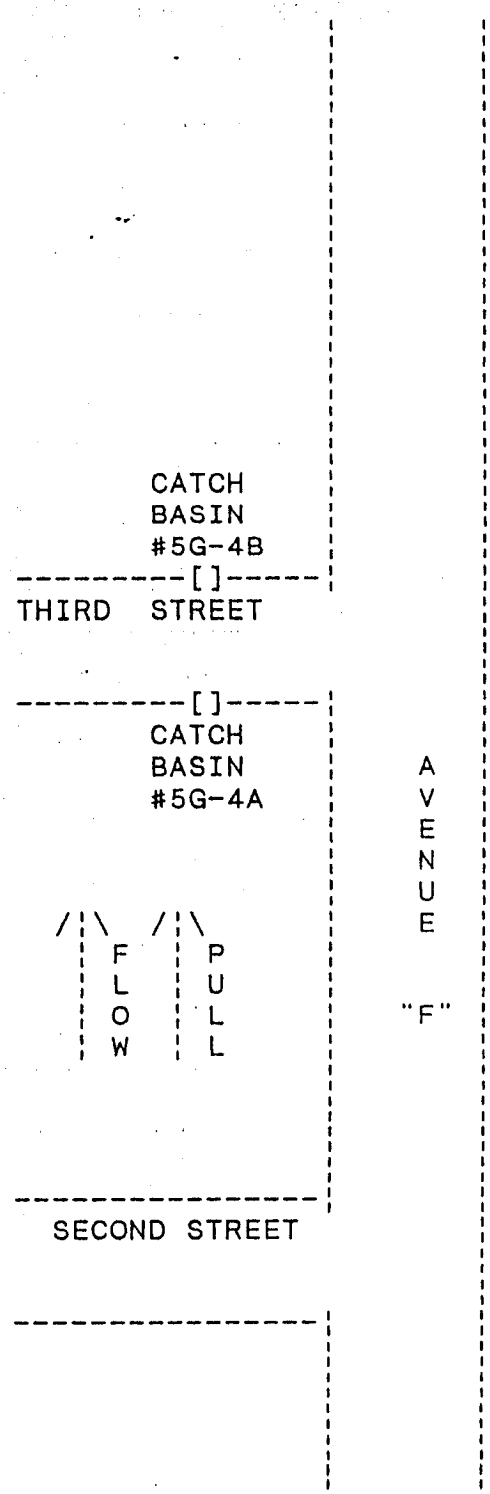
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: GOOD

GRADE: FAIR

REMARKS: _____



Run 61 Page 1

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN 5G-4B						36.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 7, 1990 RUN NO: 62

PIPE SIZE: 15" PIPE TYPE: CEMENT

JOINT LENGTH: _____ APPROX MH DEPTH: 3'

STREET: EASEMENT OFF "F" STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #5G-4C TO CATCH BASIN #5G-4B

OPERATOR: KEN GANK

TOTAL RUN: 36.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

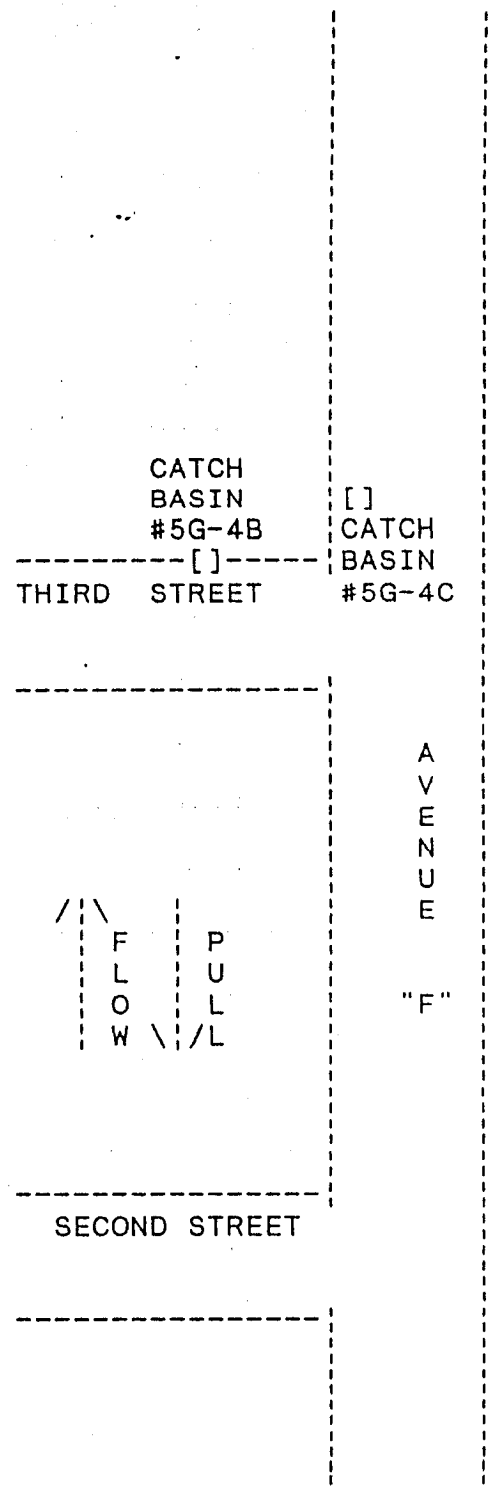
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: GOOD

GRADE: FAIR

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN 5G-4B						72.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 7, 1990 RUN NO: 63

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: _____ APPROX MH DEPTH: 3'

STREET: EASEMENT OFF "F" STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #5G-4D TO MAINLINE

OPERATOR: KEN GANK

TOTAL RUN: 54.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

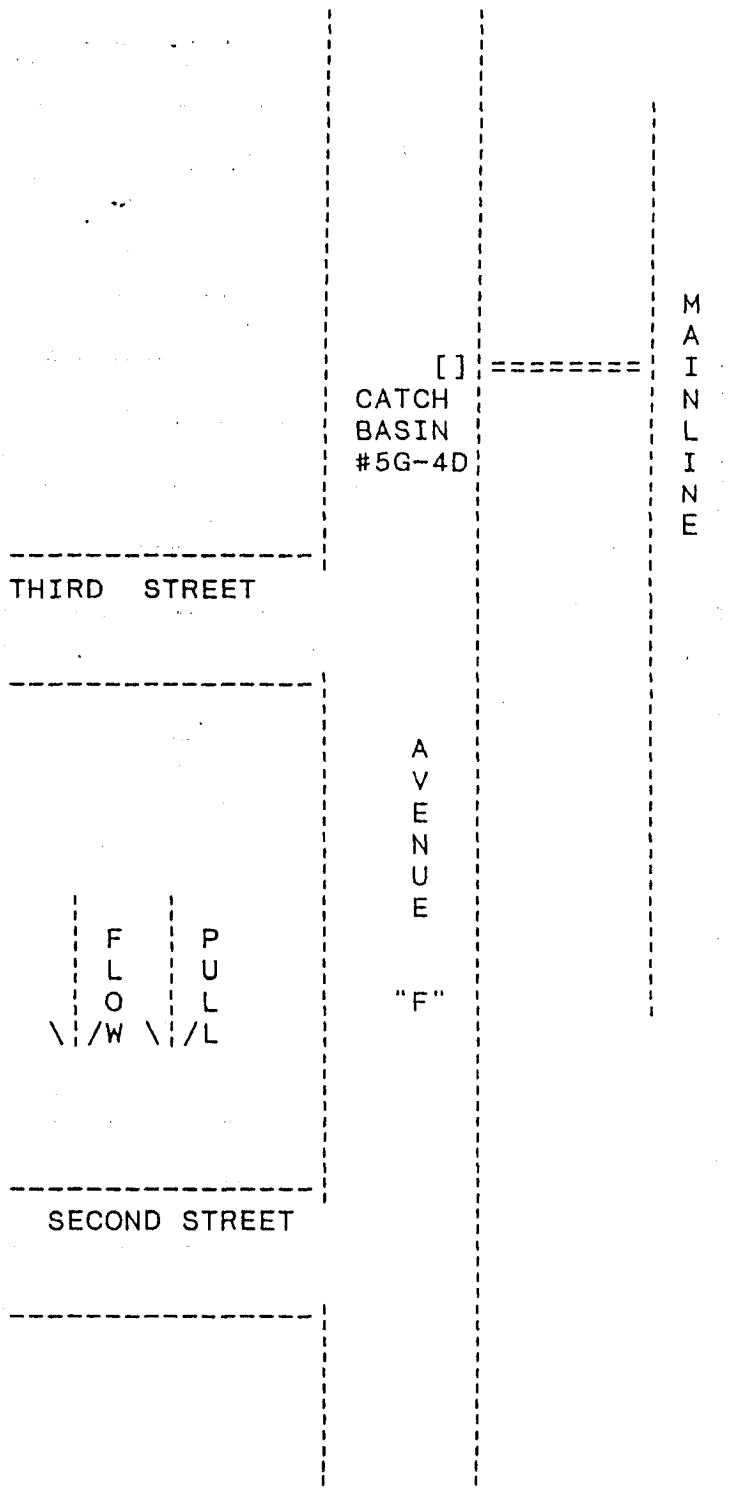
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
ROOTS	2				X	30.0
MAINLINE						54.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 7, 1990 RUN NO: 64

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: _____ APPROX MH DEPTH: 3'

STREET: UNDER "E" STREET AREA: ALAMEDA NAS

DESCRIPTION: TELEVISE FROM CATCH BASIN #5G-4D TO CATCH BASIN #5G-4C

OPERATOR: KEN GANK

TOTAL RUN: 54.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

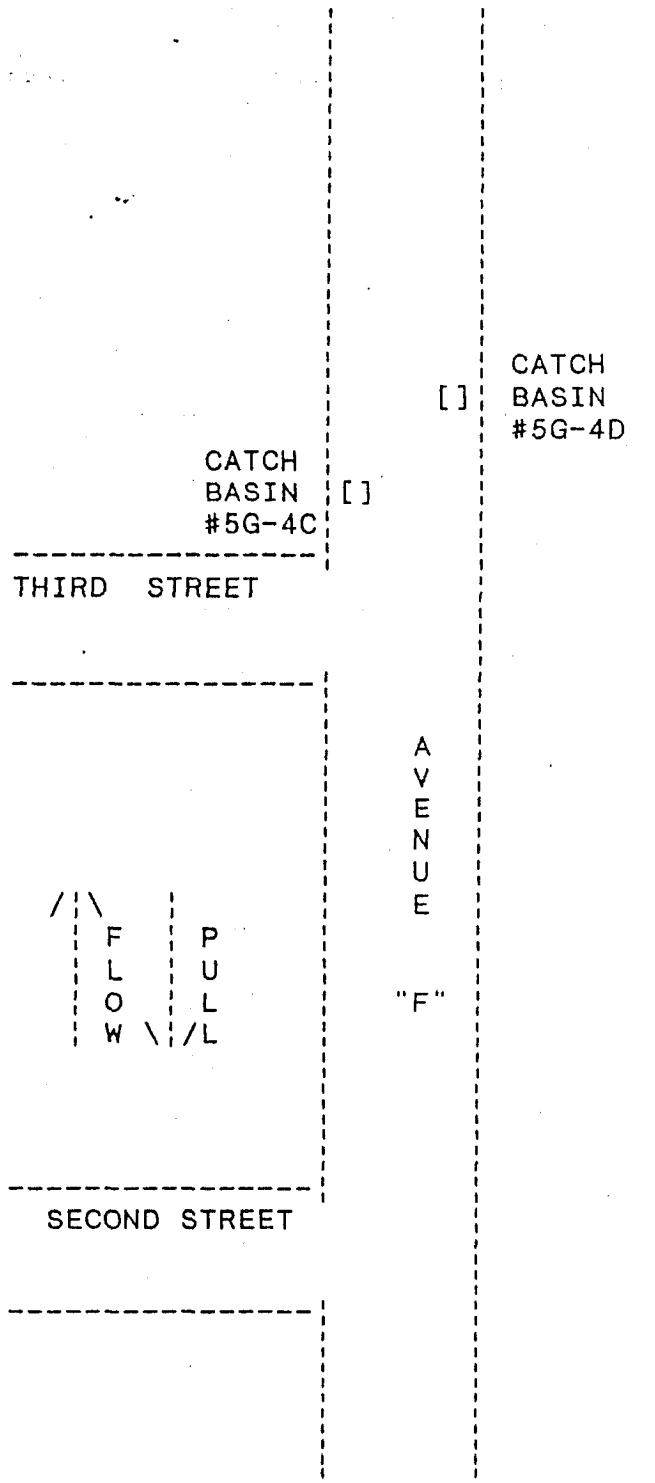
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: GOOD

GRADE: FAIR

REMARKS: DATA VIEW INCORRECTLY READS RUN #63 AND SHOULD READ RUN #64.



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN 5G-4C						54.0
CAMERA UNDERWATER IN CATCH BASIN						
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 64

PIPE SIZE: 15" PIPE TYPE: RCP

JOINT LENGTH: 6' APPROX MH DEPTH: 4'

STREET: SECOND STREET AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN 14GA TO MANHOLE #14G

OPERATOR: TIM McLEAN

TOTAL RUN: 98.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

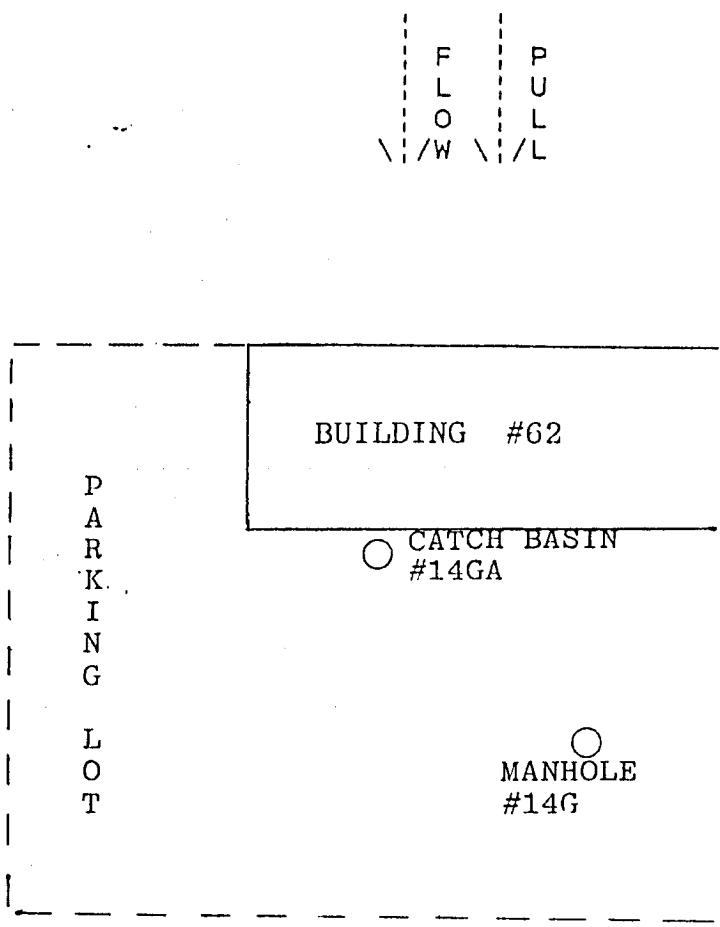
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: FAIR

GRADE: FAIR

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
ROOTS						98.0
MANHOLE #14G						98.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 65

PIPE SIZE: 8" PIPE TYPE: RCP

JOINT LENGTH: 6' APPROX MH DEPTH: 5'

STREET: AVENUE "D" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN 8G-C TO MANHOLE #8G

OPERATOR: TIM McLEAN

TOTAL RUN: 17.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

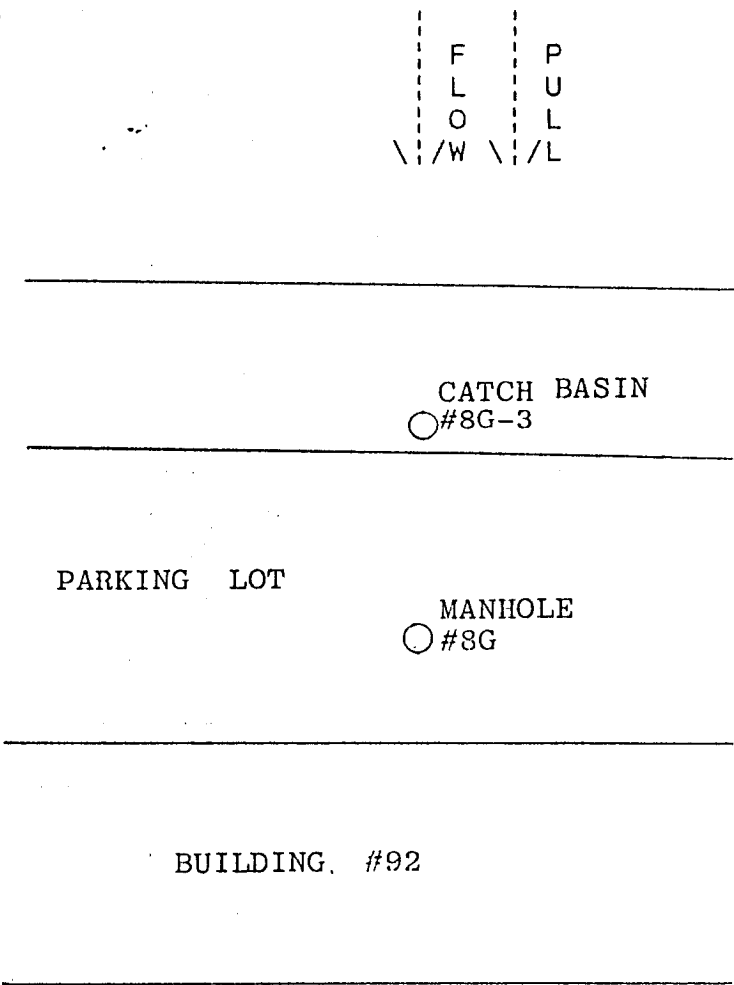
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: FAIR

GRADE: FAIR

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL						7.5
MATERIAL						12.0
CAMERA UNDERWATER						13.0
COULD NOT PASS						17.4
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 66

PIPE SIZE: 8" PIPE TYPE: RCP

JOINT LENGTH: 6' APPROX MH DEPTH: 5'

STREET: AVENUE "D" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN 8G-C TO MANHOLE #8G-B

OPERATOR: TIM McLEAN

OTAL RUN: 16.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

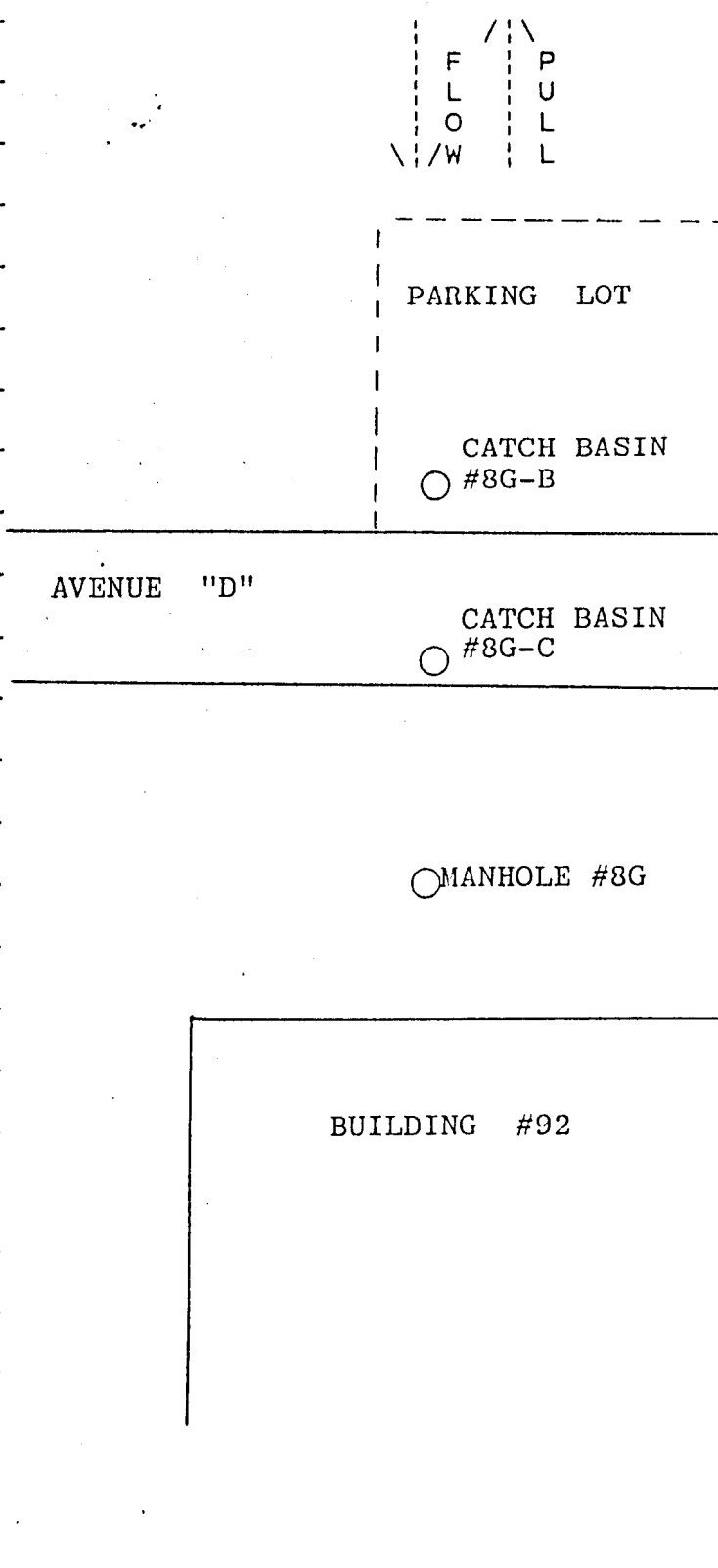
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: FAIR

GRADE: FAIR

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
SLIPLINE SECTION - UNABLE TO PASS						16.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 67

PIPE SIZE: 8" PIPE TYPE: VCP

JOINT LENGTH: 6' APPROX MH DEPTH: 5'

STREET: AVENUE "D" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN 8G-B TO MANHOLE #8G-C

OPERATOR: TIM McLEAN

OTAL RUN: 10.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

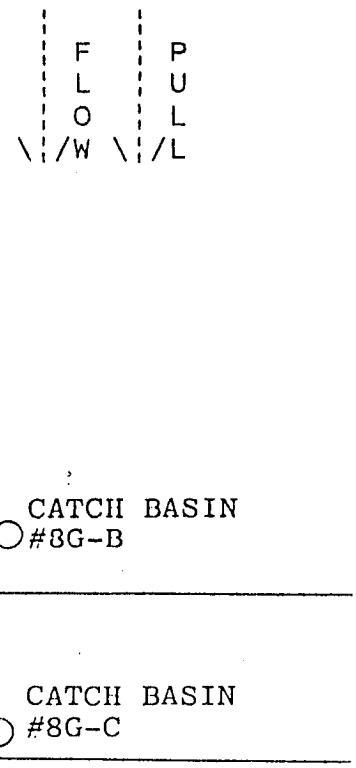
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
ROOTS						2.0
BOX						10.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 68

PIPE SIZE: 8" PIPE TYPE: RCP

JOINT LENGTH: 4' APPROX MH DEPTH: 3'

STREET: AVENUE "D" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN 8G-A TO MANHOLE #8G-C

OPERATOR: TIM McLEAN

TOTAL RUN: 7.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

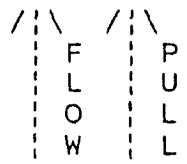
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: FAIR

GRADE: FAIR

REMARKS: _____



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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
45 DEGREE BEND - UNABLE TO PASS						7.0
END OF RUN						

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CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 69

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 6' APPROX MH DEPTH: 3'

STREET: AVENUE "D" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN 10G-C TO MANHOLE #10G-D

OPERATOR: TIM McLEAN

OTAL RUN: 16.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

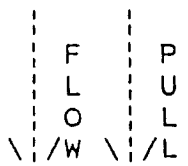
CHEMICALS USED: _____

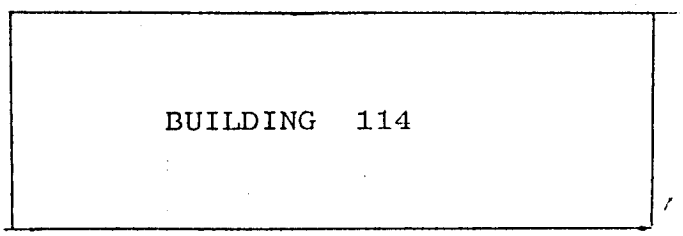
PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: FAIR

GRADE: FAIR

REMARKS: _____





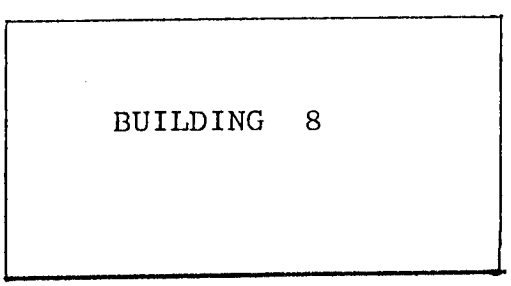
PARKING LOT

CATCH BASIN #10G-C

AVENUE "D"

CATCH BASIN #10G-D

PARKING LOT



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
PIPE CHANGES TO SMALLER PIPE						16.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 70

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 9'

STREET: AVENUE "C" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM MANHOLE 6E1

TO MANHOLE #6E

OPERATOR: ROB MAGOWAN

TOTAL RUN: 235.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

CHEMICALS USED: _____

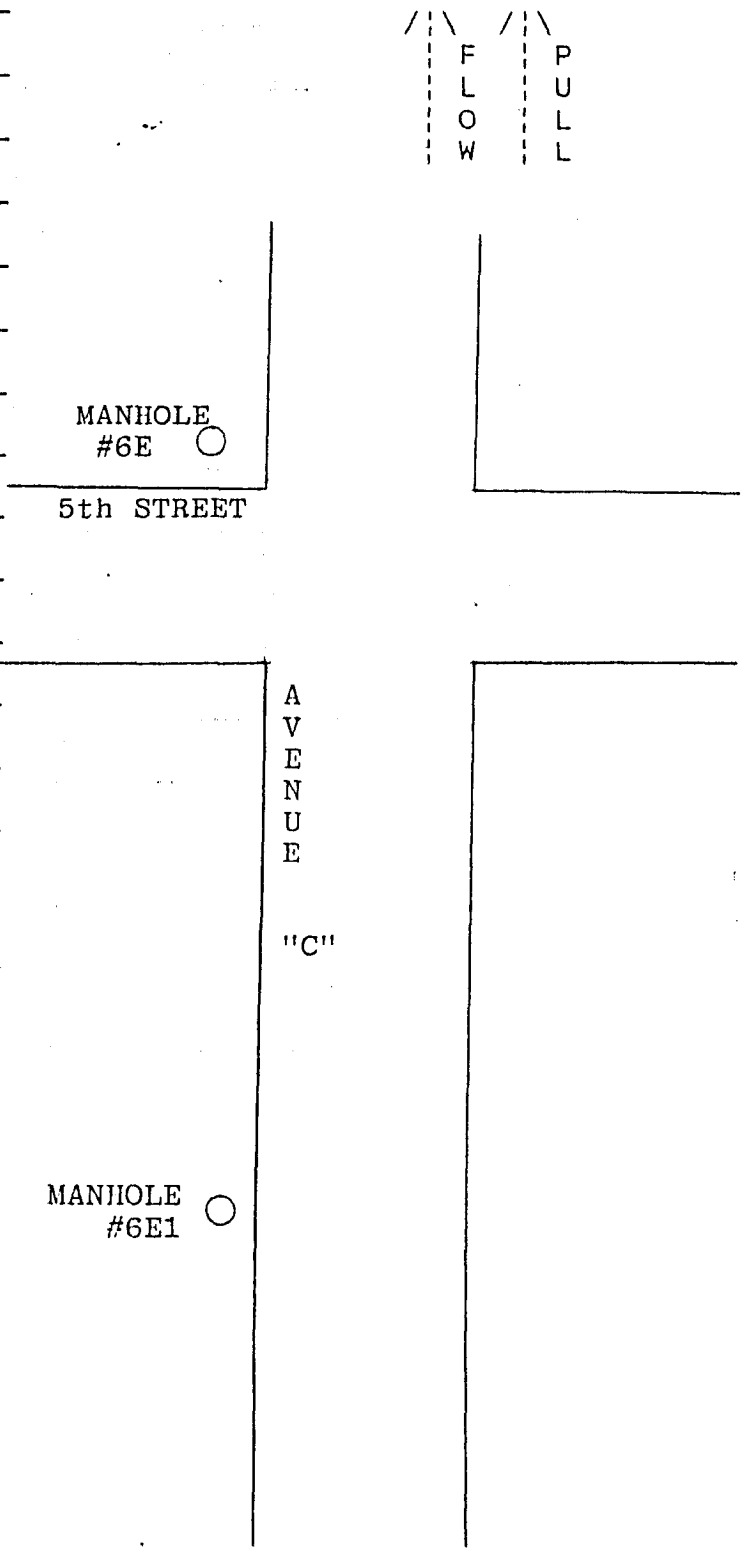
PHOTOS TAKEN: _____ VIDEO TAPES: 10

PIPE CONDITION: GOOD - WITH NOTED

EXCESSIVE MATERIAL IN LINE

GRADE: GOOD

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
MANHOLE #6E						235.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 71

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 9'

STREET: AVENUE "C" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM MANHOLE 6E1

TO CATHH BASIN 6E1-A

OPERATOR: ROB MAGOWAN

TOTAL RUN: 73.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

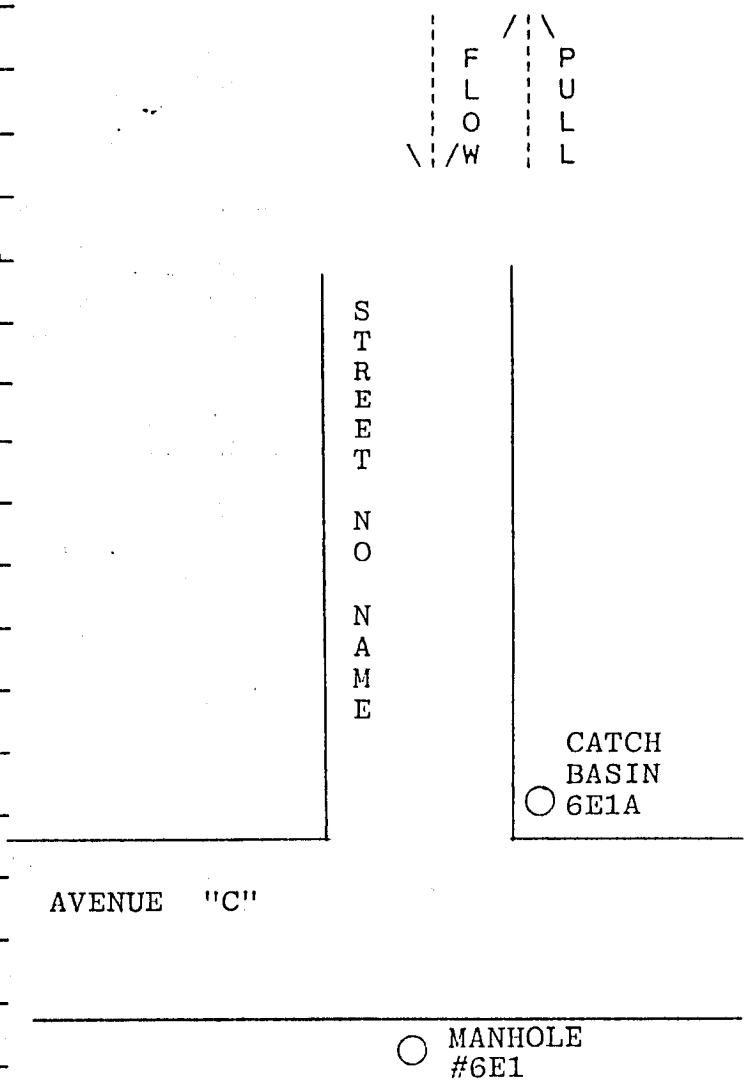
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 10

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN #6E1A						73.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 72

PIPE SIZE: 12" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 9'

STREET: AVENUE "C" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM MANHOLE 6E1
THRU CATCH BASIN 6E1-C TO CATCH
BASIN 6E1-B

OPERATOR: ROB MAGOWAN

TOTAL RUN: 63.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

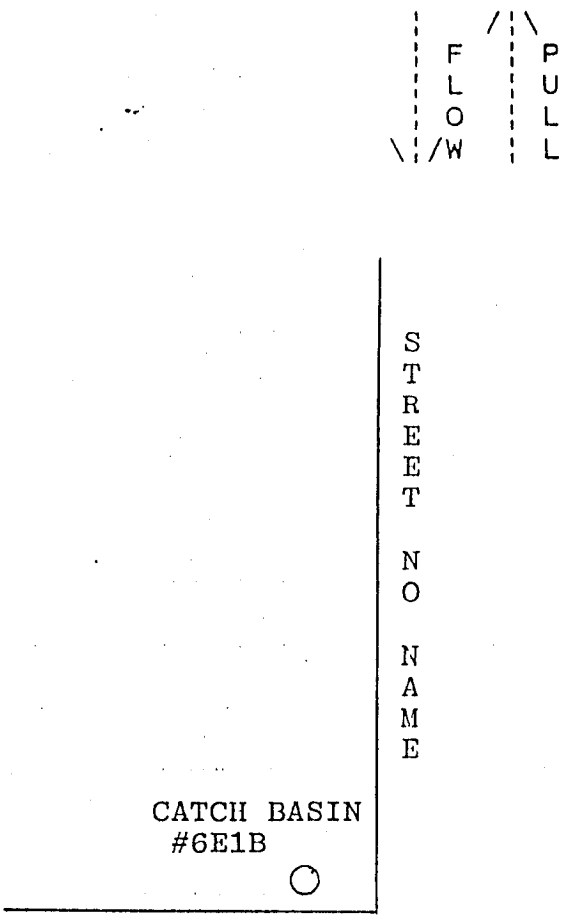
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 10

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN #6E1C						18.0
CATCH BASIN #6E1B						63.0
END OF RUN						

Pacific Pipeline Survey

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CLIENT: A N WEST

DATE: NOVEMBER 13, 1990 RUN NO: 73

PIPE SIZE: 5" PIPE TYPE: CEMENT

JOINT LENGTH: N/A APPROX MH DEPTH: 4'

STREET: AVENUE "A" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM MANHOLE 3D1-B

TOWARD CATCH BASIN 3D1-A

OPERATOR: ROB MAGOWAN

OTAL RUN: 2.0'

AIR TEST PRESSURE: AIR TEST DURATION:

JOINTS TESTED: JOINTS SEALED:

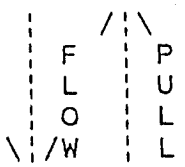
CHEMICALS USED:

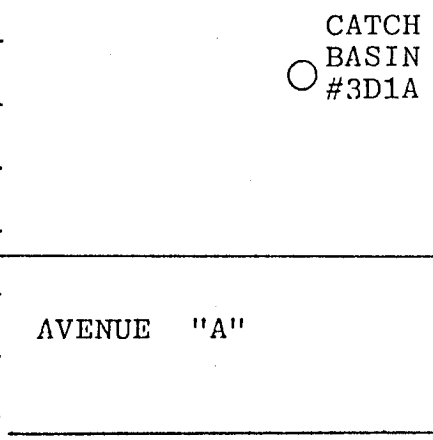
PHOTOS TAKEN: VIDEO TAPES: 10

PIPE CONDITION: GOOD - WHAT WAS OBSERVED

GRADE: FAIR - WHAT WAS OBSERVED

REMARKS: CAMERA WILL NOT FIT IN LINE





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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
COULD NOT GET CAMERA INTO LINE						2.0

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 13, 1990 RUN NO: 74

PIPE SIZE: 8" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 4'

STREET: AVENUE "A" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM MANHOLE 3D1-B
THRU CACCH BASIN 3D1-C TO CATCH
BASIN 3D1

OPERATOR: ROB MAGOWAN

TOTAL RUN: 95.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: ____

JOINTS TESTED: _____ JOINTS SEALED: _____

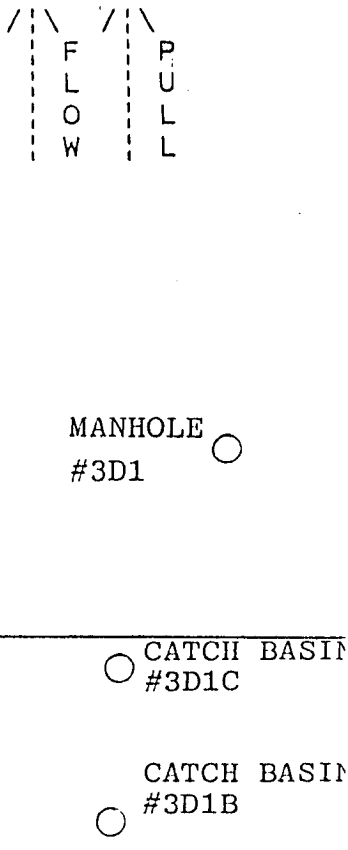
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 10

PIPE CONDITION: GOOD - WITH NOTED EXCEPTIONS

GRADE: GOOD

REMARKS: BEND AT 35.0' TO RIGHT



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN #3D1C						31.0
SHEAR BREAK						93.0
CATCH BASIN #3D1						95.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 13, 1990 RUN NO: 75

PIPE SIZE: 36" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH:

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TV INSIDE MANHOLE S TO SHOW EXCESSIVE MATERIAL ALSO LEAK AT OUTFALL

OPERATOR: ROB MAGOWAN

TOTAL RUN:

AIR TEST PRESSURE: AIR TEST DURATION:

JOINTS TESTED: JOINTS SEALED:

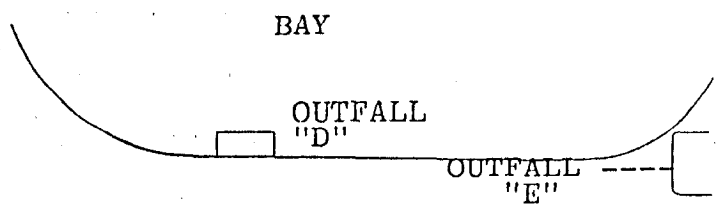
CHEMICALS USED:

PHOTOS TAKEN: VIDEO TAPES: 10

PIPE CONDITION: MANHOLE #1, MANHOLE #1D MANHOLE #2, MANHOLE #2D, MANHOLE #3 MANHOLE #1D-A ARE NOT ON PLANS. 36" TAKES A 90 DEGREE TURN TO RIGHT OUT OF AND TIES INTO OUTFALL "E"

GRADE: TVED AT LOW TIDE, MANHOLE #4 OUTFALL "D", #5 IS MANHOLE 8E-A

REMARKS: AND OUTFALL SHOTS ARE AUDIO.



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
#1 MANHOLE #1-D - TVED INSIDE						
#2 MANHOLE #2-D - TVED INSIDE						
#3 MANHOLE #1-D-A - TVED INSIDE						
#4 OUTFALL "D" UPSTREAM	--					
#5 MANHOLE #8 E-A (8 E-A NOT ON PLANS)						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 14, 1990 RUN NO: 76

PIPE SIZE: 12" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 3

STREET: MAIN STREET AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #1DA TO CATCH BASIN #1DB

OPERATOR: ROB MAGOWAN

TOTAL RUN: 357.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

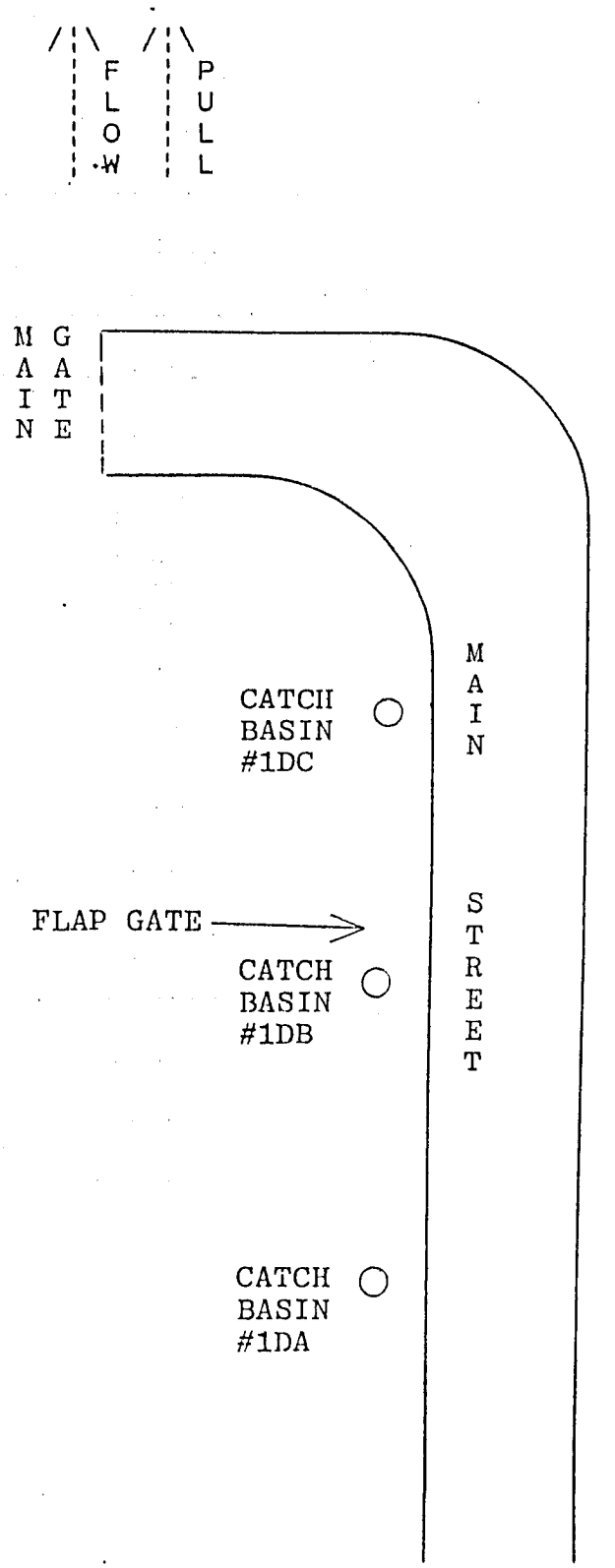
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 10 & 12

PIPE CONDITION: GOOD - EXCEPT AS NOTED

GRADE: GOOD

REMARKS: CAMERA UNDERWATER FROM 320' TO 357' FLAT GATE APPROX. 1' IN PIPE, COULD NOT GET BY WITH CLEANER OR CAMERA. AUDIO AT END OF RUN SHOWING FLAP GATE.



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
BREAK						53.0
ROOTS	2					77.0
ROOTS	1					80.5
ROOTS	2					87.0
BREAK						167.0
CATCH BASIN #1DB						357.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 14, 1990 RUN NO: 77

PIPE SIZE: 21" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 9

STREET: EASEMENT AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #6G-17
TO CATCH BASIN #6G-16

OPERATOR: ROB MAGOWAN

TOTAL RUN: 310.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

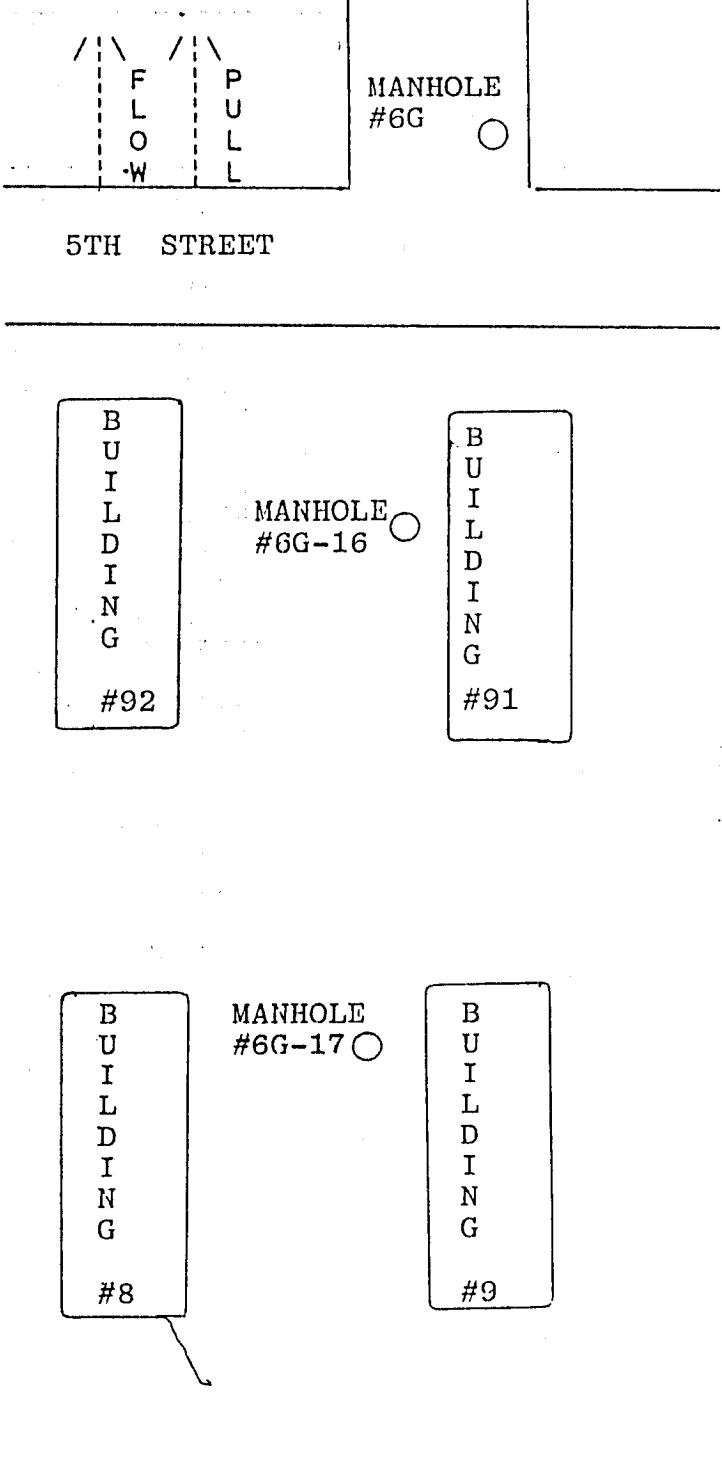
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 12

PIPE CONDITION: FAIR - WHAT WAS OBSERVED

GRADE: POOR - EXCESSIVE MATERIAL

REMARKS: AND WATER



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
POSSIBLE LATERAL		X				141.0
POSSIBLE LATERAL		X			X	187.0
LATERAL		X			X	247.0
MANHOLE #6G16 - CAMERA UNDERWATER	--					310.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 15, 1990 RUN NO: 78

PIPE SIZE: 12" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 3'

STREET: PARKING LOT AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #4G1B TOWARD MANHOLE 4G1

OPERATOR: ROB MAGOWAN

TOTAL RUN: 27.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

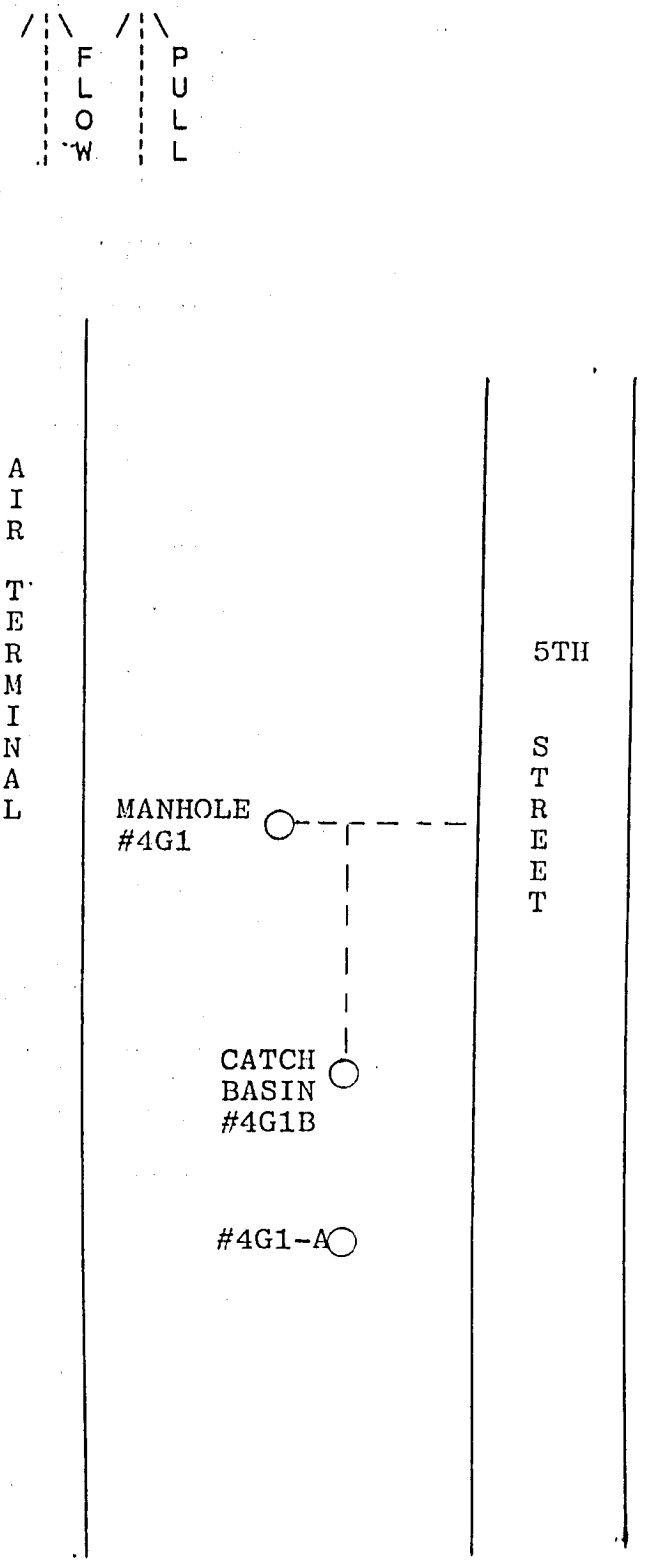
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 12

PIPE CONDITION: FAIR - WHAT WAS OBSERVED

GRADE: FAIR

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
TOO MUCH MUD IN LINE						27.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 15, 1990 RUN NO: 79

PIPE SIZE: 18" PIPE TYPE: CEMENT

JOINT LENGTH: 3' APPROX MH DEPTH: 9'

STREET: AVENUE "E" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #6G1

TO MANHOLE #6G

OPERATOR: ROB MAGOWAN

TOTAL RUN: 214.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

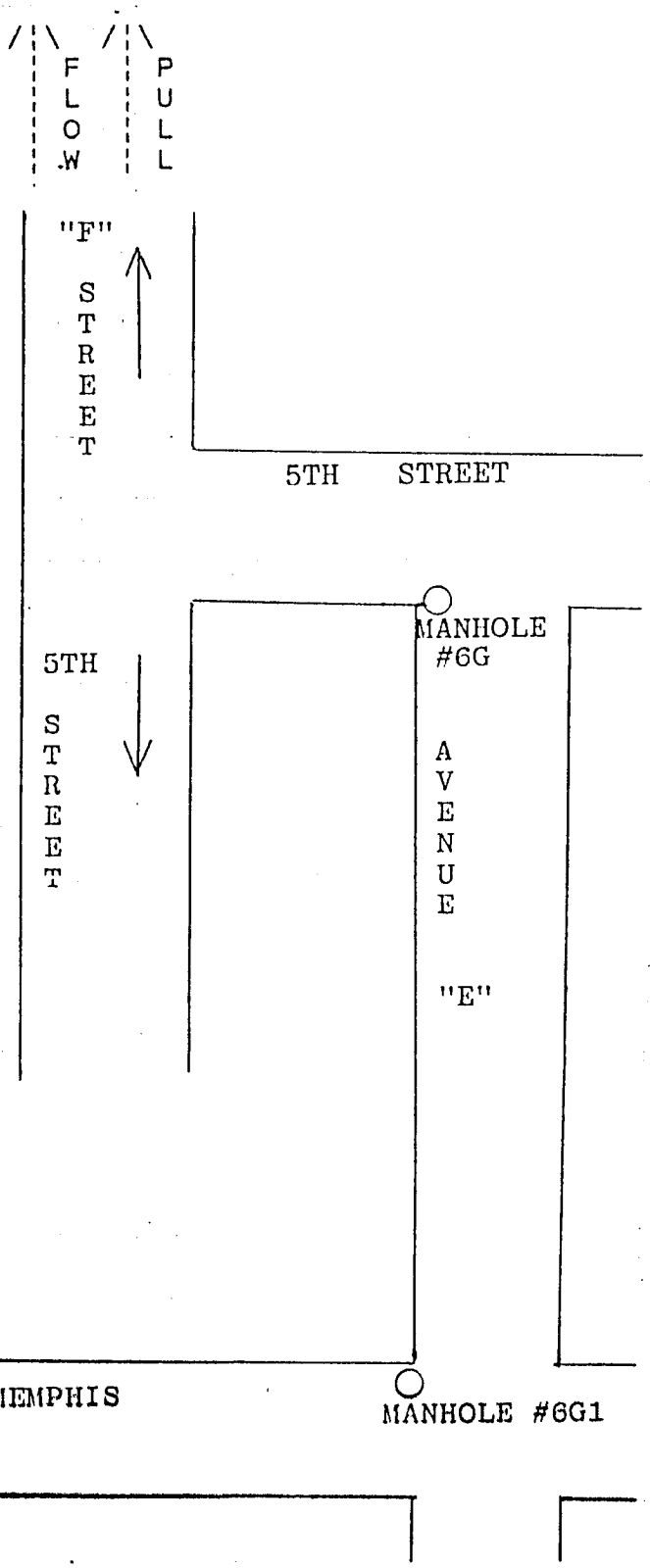
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 12

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LATERAL		X			X	69.0
LATERAL		X			X	129.0
MANHOLE #6G						214.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 80

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 6' APPROX MH DEPTH:

STREET: AVENUE "D" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #10G-D
TO CATCH BASIN #10G-C

OPERATOR: TIM McLEAN

TOTAL RUN: 13.0'

AIR TEST PRESSURE: AIR TEST DURATION:

JOINTS TESTED: JOINTS SEALED:

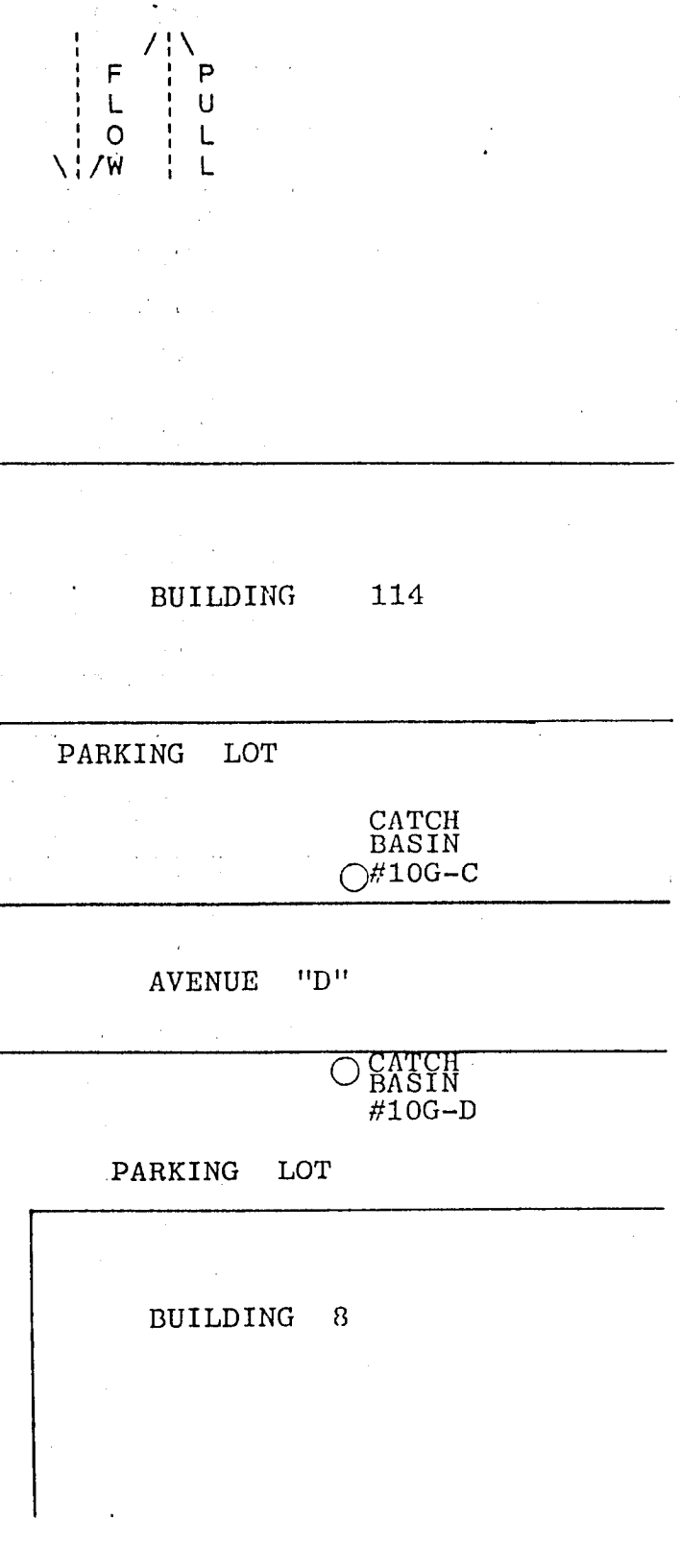
CHEMICALS USED:

PHOTOS TAKEN: VIDEO TAPES:

PIPE CONDITION: POOR - WITH NOTED BLOCKAGE

GRADE: GOOD - WHAT WAS OBSERVED.

REMARKS:



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Client A N WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
MATERIAL BLOCKING LINE						13.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 81

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 6' APPROX MH DEPTH: 3'

STREET: AVENUE "D" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #10G-D TO MAIN LINE

OPERATOR: TIM McLEAN

TOTAL RUN: 16.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

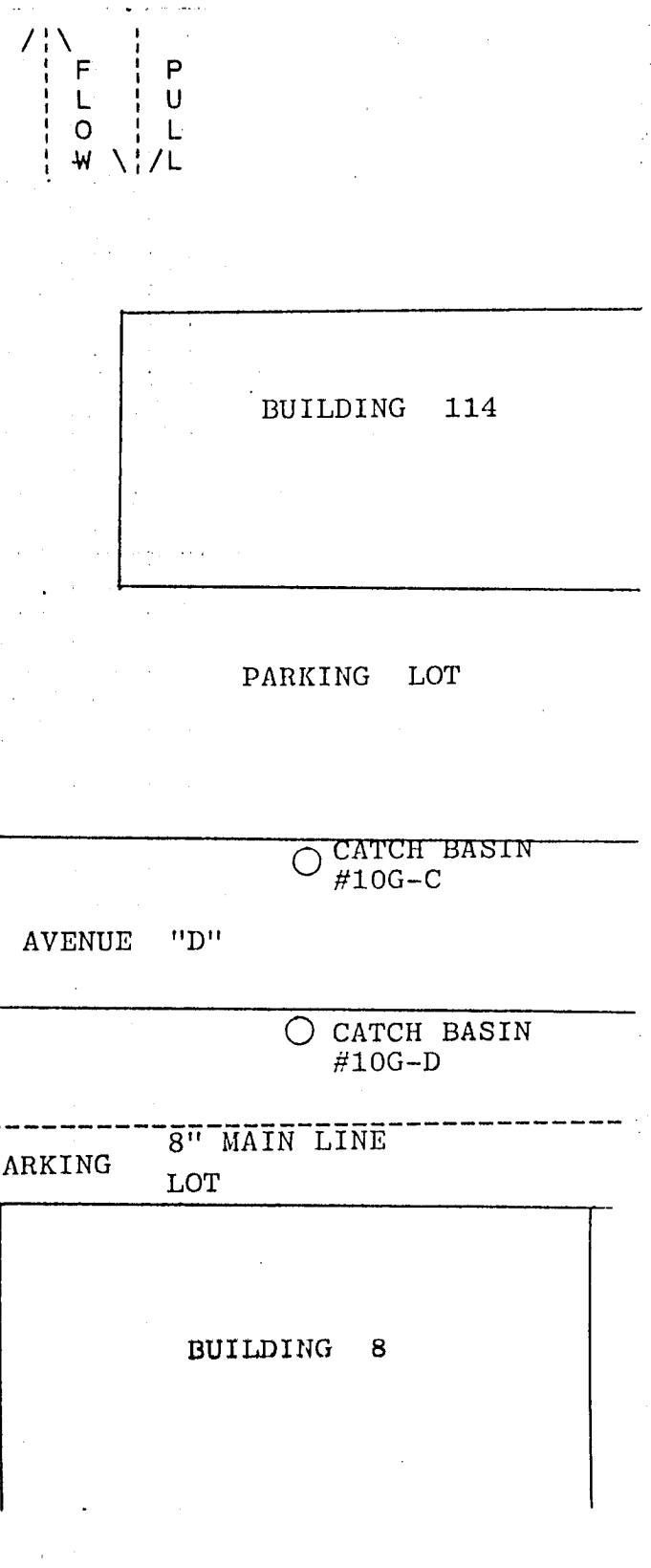
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: FAIR

GRADE: FAIR

REMARKS: _____



Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 12, 1990 RUN NO: 82

PIPE SIZE: 8" PIPE TYPE: CMP

JOINT LENGTH: UNKNOWN APPROX MH DEPTH: 3'

STREET: AVENUE "D" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #10G-C
TO CATCH BASIN #10G-B

OPERATOR: TIM McLEAN

TAL RUN: 17.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

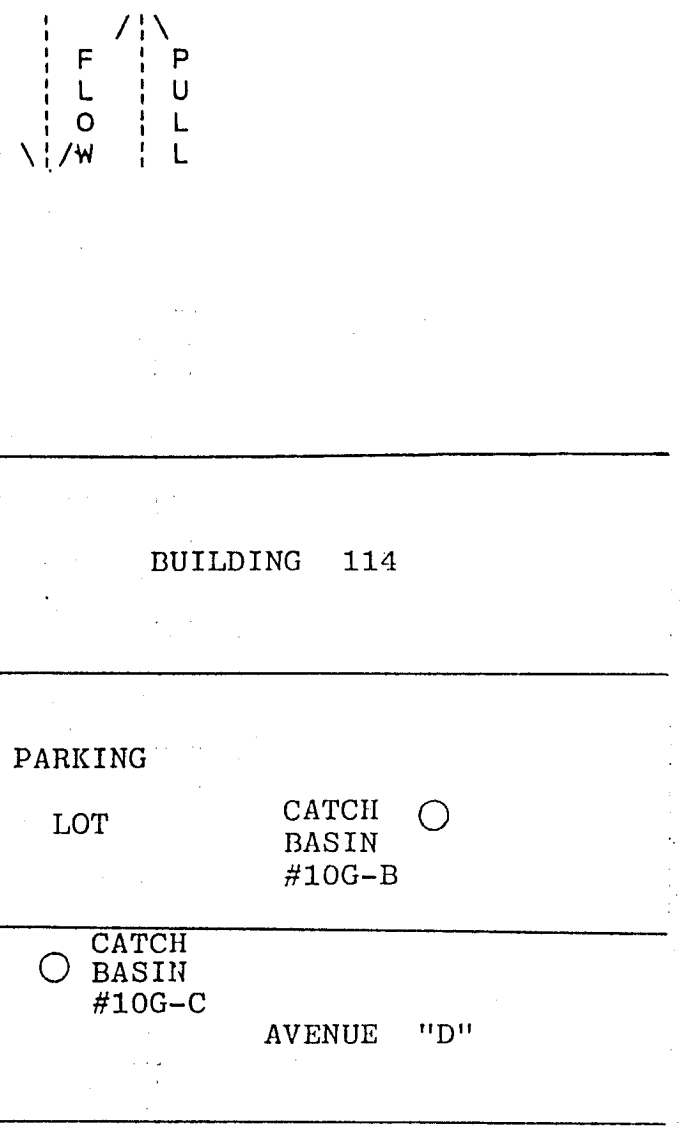
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: FAIR

GRADE: FAIR

REMARKS: _____



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Client A N WEST

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TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CAMERA IS HANGING UP ON COUPLINGS						17.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 13, 1990 RUN NO: 83

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 6' APPROX MH DEPTH: 4'

STREET: AVENUE "F" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #5G-2A TO CATCH BASIN #5G-2B

OPERATOR: TIM McLEAN

TOTAL RUN: 57.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

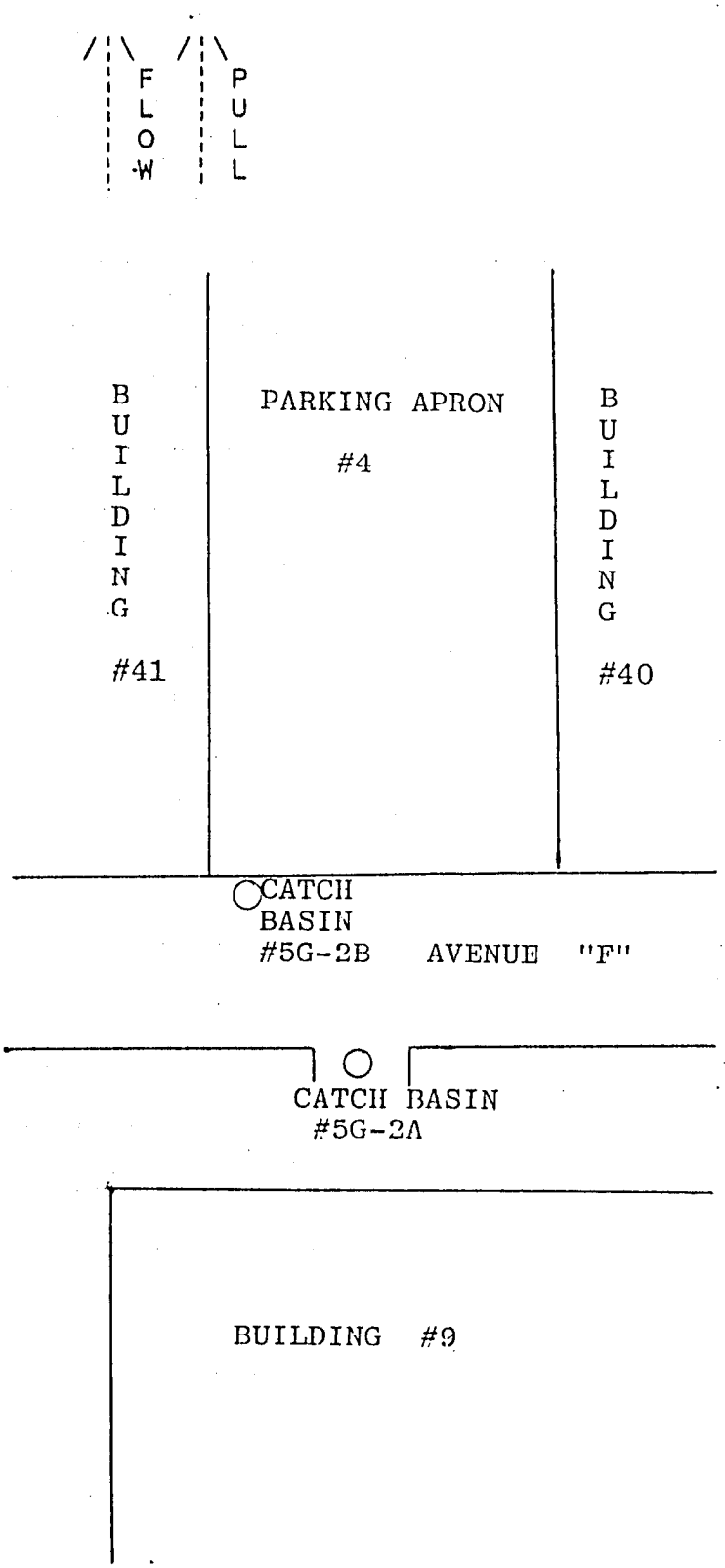
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: GOOD

GRADE: FAIR

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN #5G-2B						57.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 13, 1990 RUN NO: 84

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 6' APPROX MH DEPTH: 4'

STREET: AVENUE "F" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #5G-2B TO BEND IN LINE

OPERATOR: JOE LODEL

TOTAL RUN: 24.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

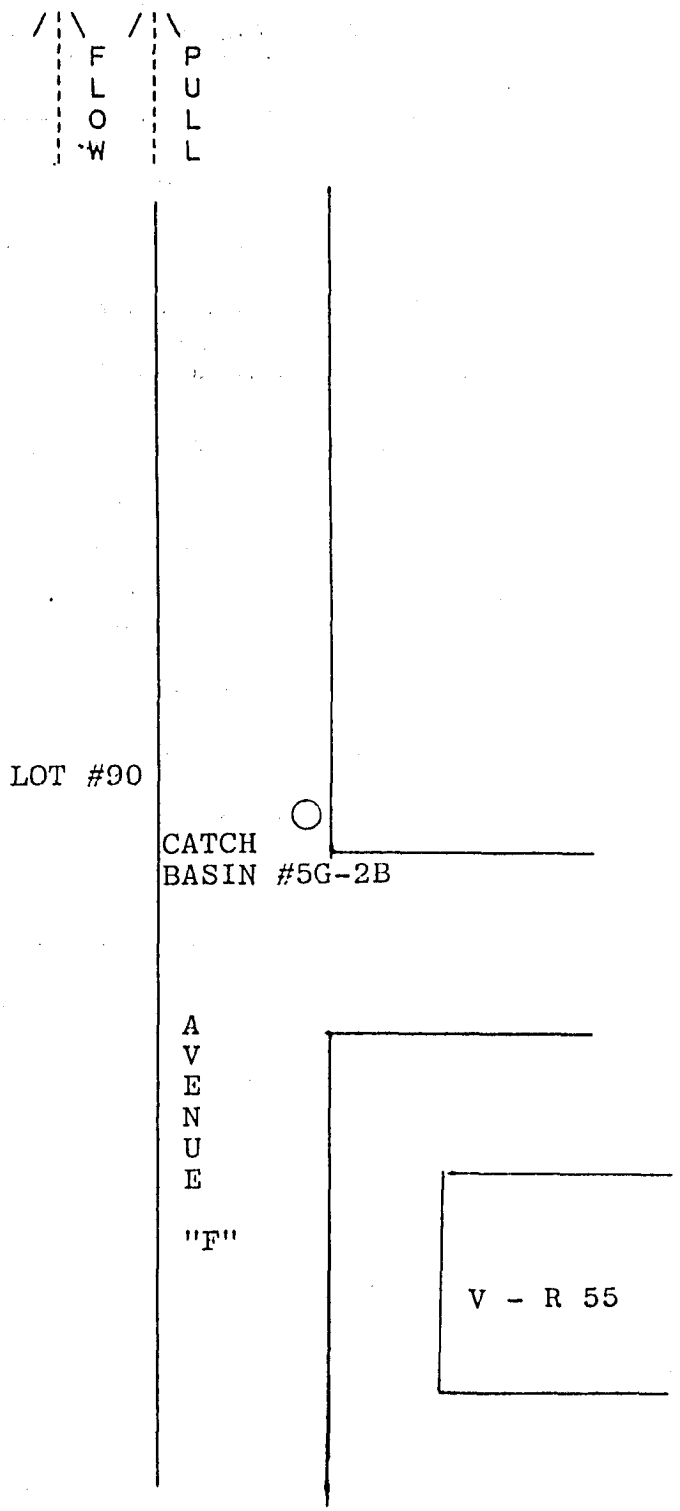
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: FAIR - LIGHT MATERIAL IN FIRST 15'.

GRADE: FAIR

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
LINE BENDS TO THE RIGHT						3.0
COULD NOT PUSH CAMERA ANY FURTHER						24.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 13, 1990 RUN NO: 85

PIPE SIZE: 8" PIPE TYPE: RCP

JOINT LENGTH: 4' APPROX MH DEPTH: 5'

STREET: FIFTH AVENUE & AVENUE "F" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #5G-G TO 45 DEGREE TURN

OPERATOR: JOE LODEL

TOTAL RUN: 15.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

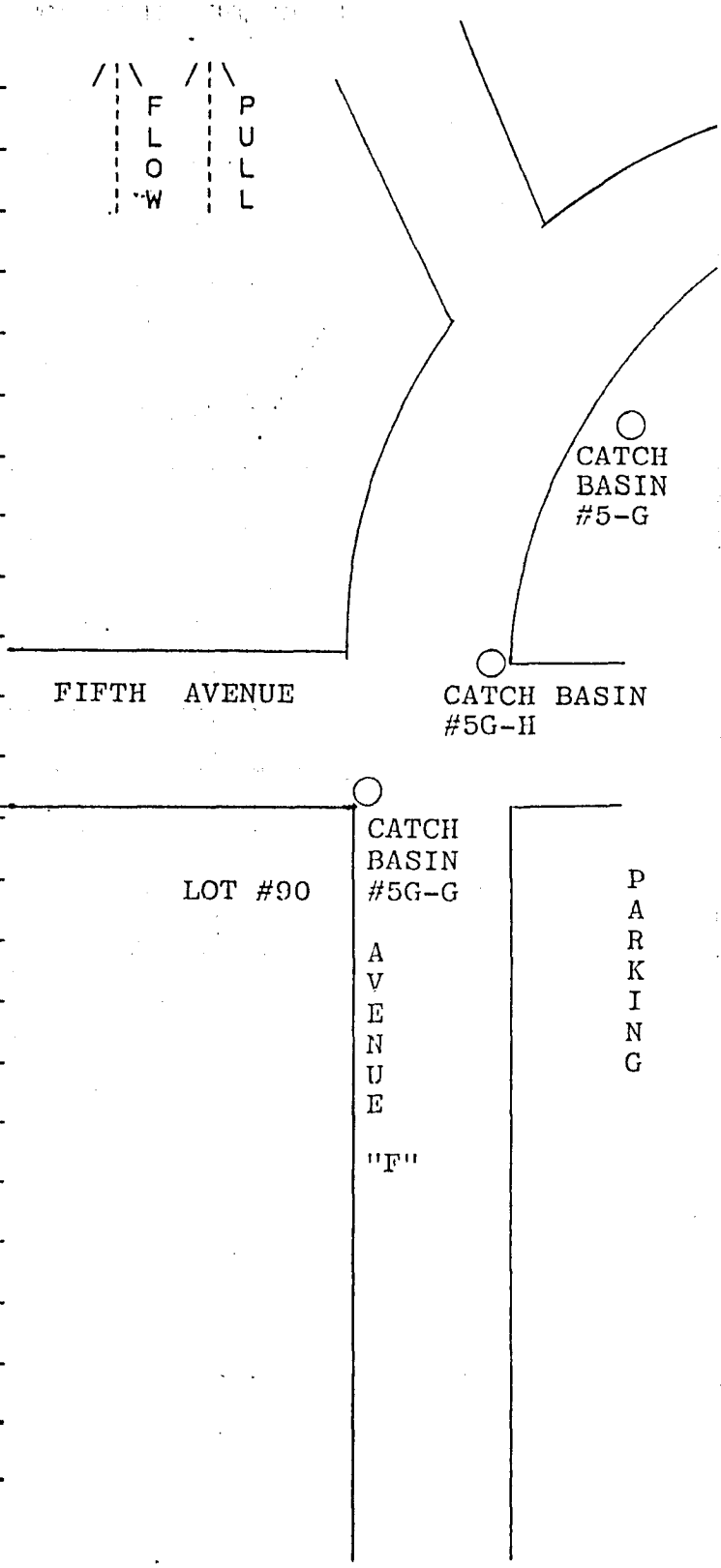
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: FAIR

GRADE: GOOD

REMARKS: PIPE SIZE IS 8" AT CATCH BASIN 5G-G AND 12" AT CATCH BASIN 5G-H. WILL PUSH CAMERA WITH ROD AS FAR AS POSSIBLE FROM BOTH CATCH BASINS



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
PIPE MAKES A 45 DEGREE TURN DOWN						15.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 13, 1990 RUN NO: 86

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 8' APPROX MH DEPTH: 4'

STREET: AVENUE "F" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #5G-H TO MAIN

OPERATOR: JOE LODEI

TOTAL RUN: 26.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

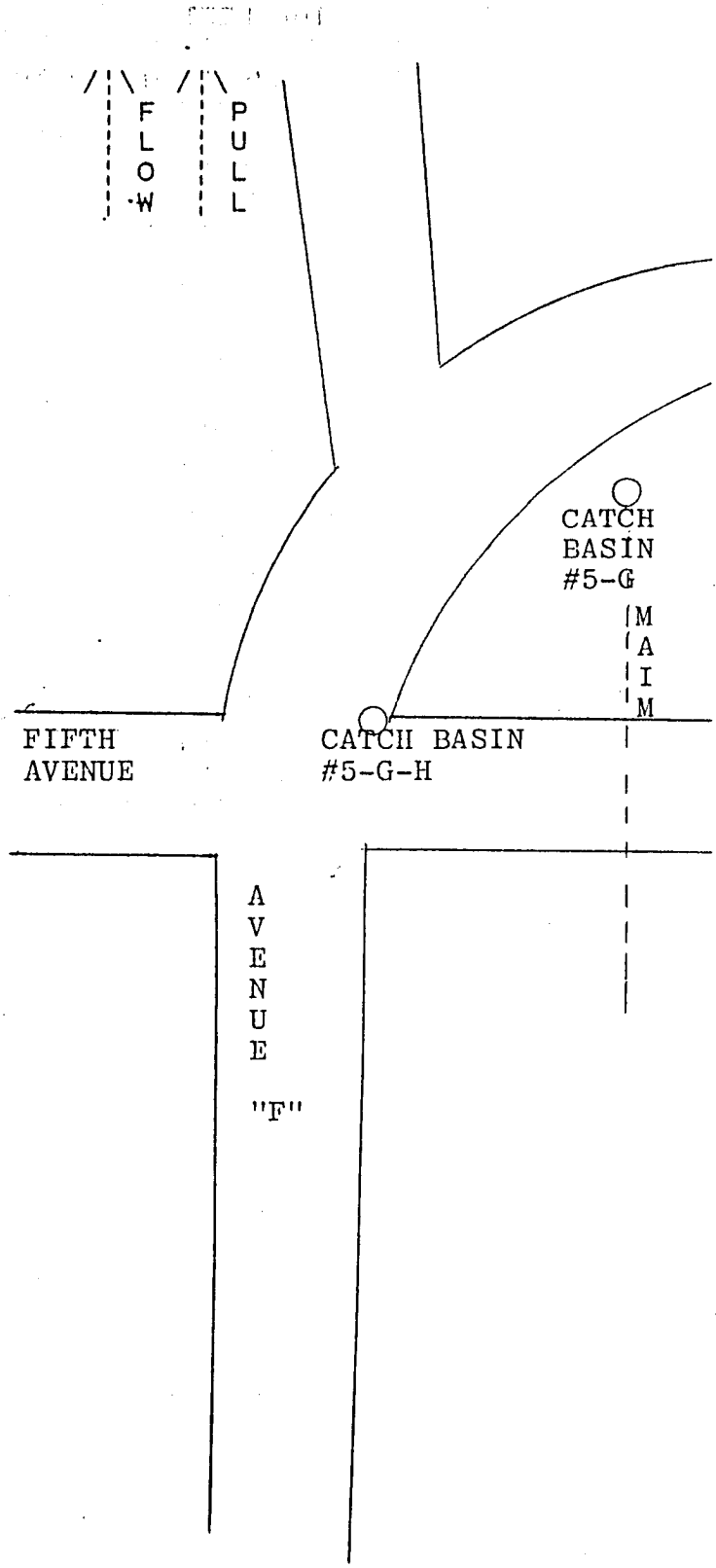
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: FAIR

GRADE: GOOD

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
PIPE BENDS TO THE LEFT						3.0
COULD NOT PUSH CAMERA ANY FURTHER						26.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 13, 1990 RUN NO: 86

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 8' APPROX MH DEPTH: 4'

STREET: AVENUE "F" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #5G-H
TO UPSTREAM 15.0'

OPERATOR: JOE LODEL

TOTAL RUN: 15.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

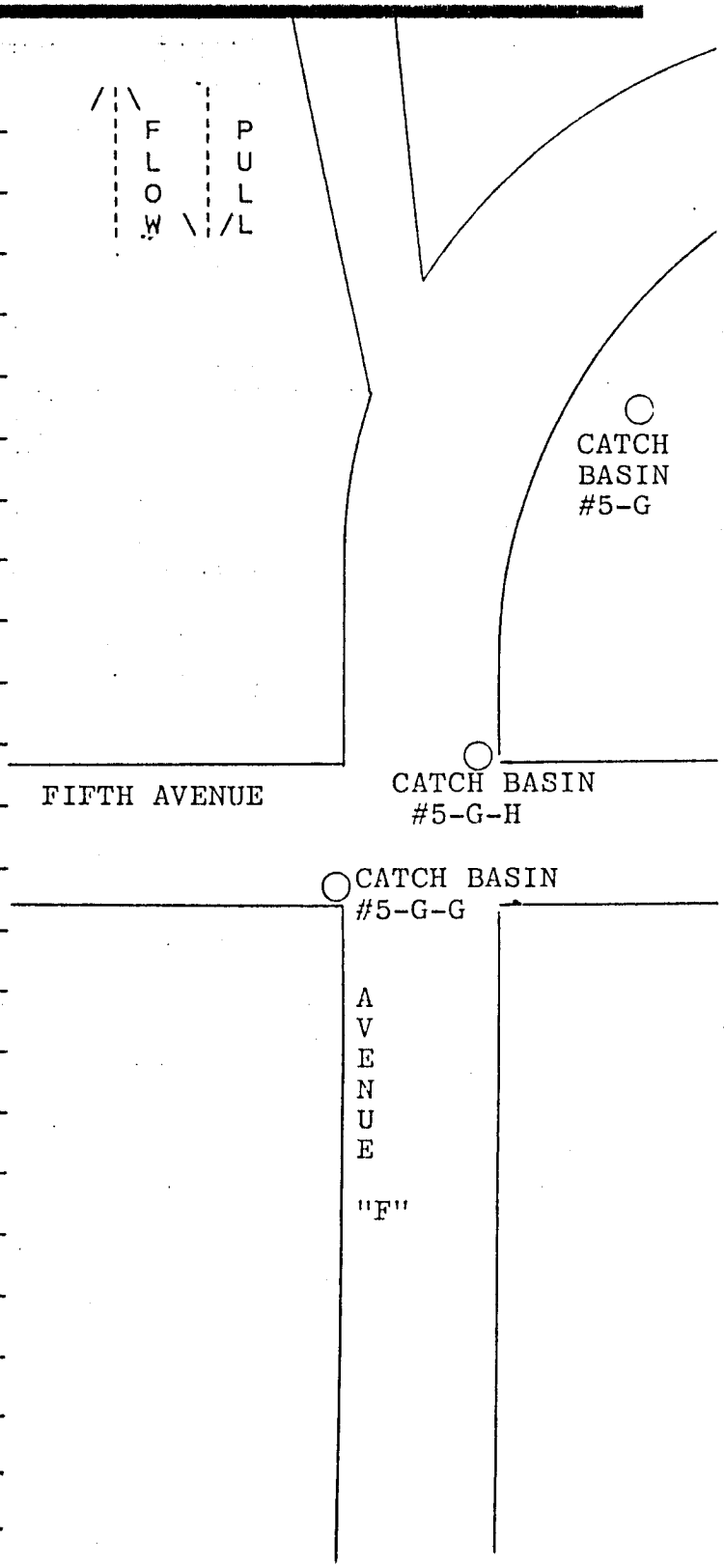
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: FAIR

GRADE: FAIR

REMARKS: PIPE SIZE ON TAPE READS 8"
SHOULD BE 12".



Pacific Pipeline Survey

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CLIENT: A N WEST

DATE: NOVEMBER 13, 1990 RUN NO: 87

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 4' APPROX MH DEPTH: 4'

STREET: FIFTH AVENUE AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #5G-D DOWNSTREAM 26.0'

OPERATOR: JOE LODEL

TOTAL RUN: 26.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

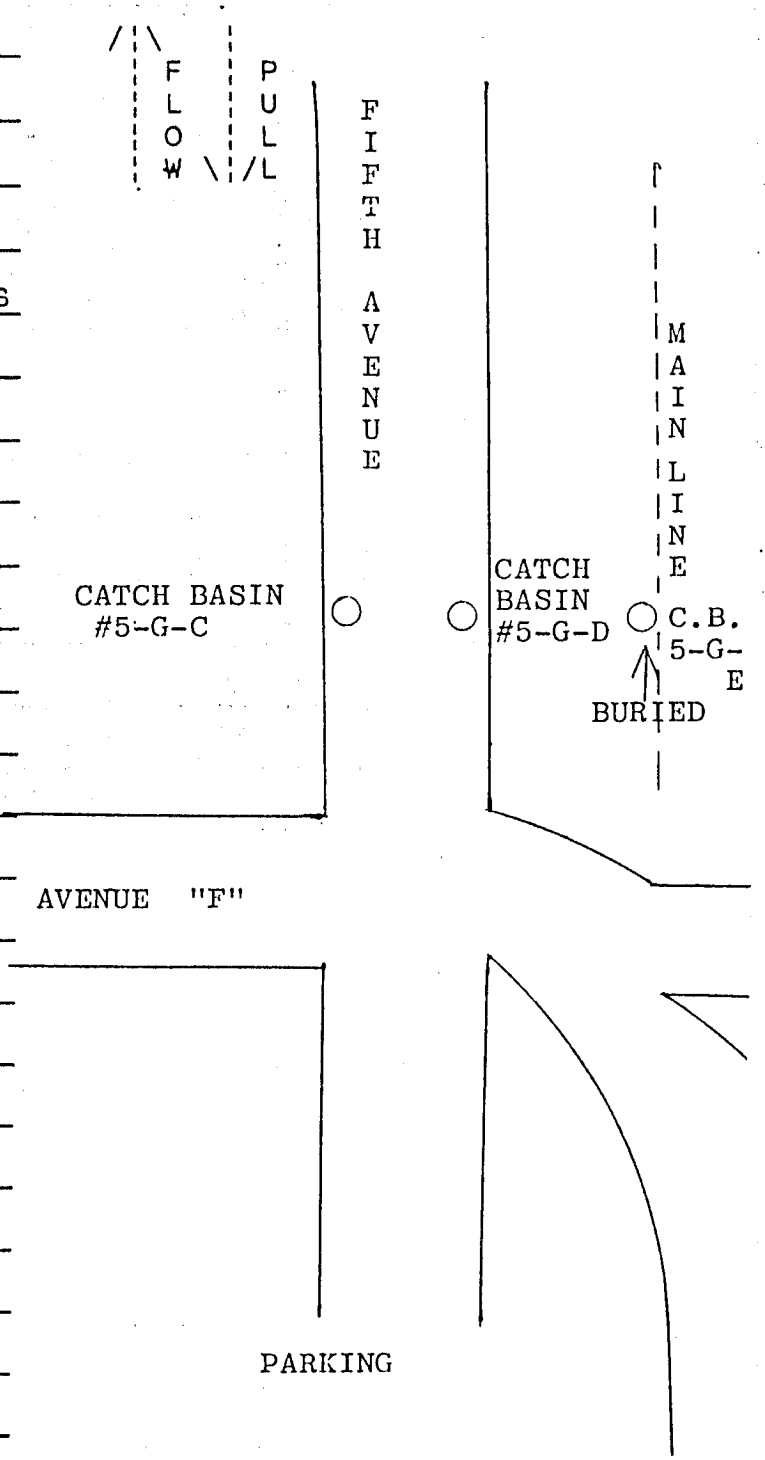
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: GOOD

GRADE: GOOD

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
COULD NOT PUSH CAMERA ANY FURTHER						26.0
END OF RUN						

Pacific Pipeline Survey

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CLIENT: A N WEST

DATE: NOVEMBER 13, 1990 RUN NO: 88

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 4' APPROX MH DEPTH: 4'

STREET: FIFTH AVENUE AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #5G-D
UPSTREAM 27.0'

OPERATOR: JOE LODEL

TAL RUN: 27.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

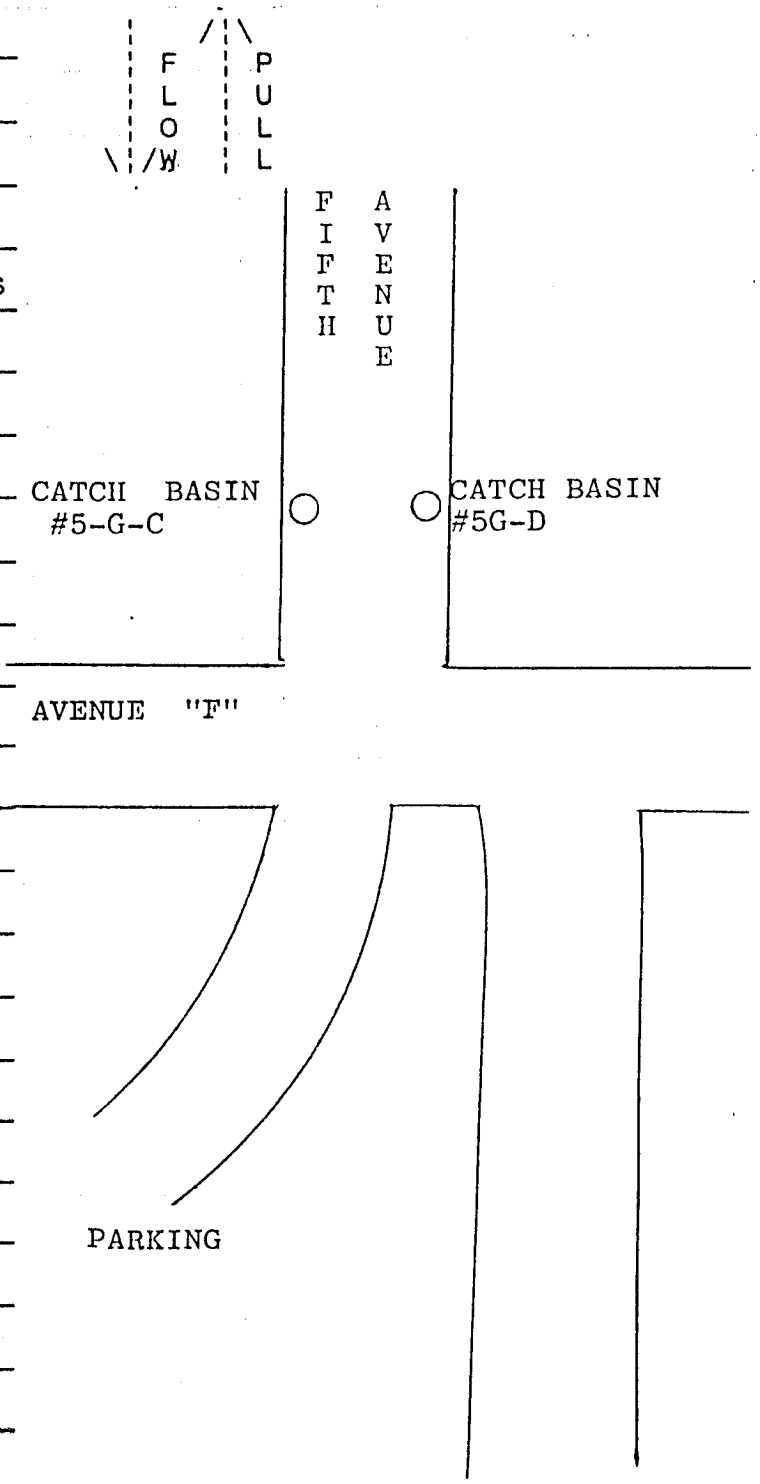
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: GOOD - WITH LIGHT
MATERIAL

GRADE: GOOD

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
END OF ROD						27.0
END OF RUN						

Pacific Pipeline Survey

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CLIENT: A N WEST

DATE: NOVEMBER 13, 1990 RUN NO: 89

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 4' APPROX MH DEPTH: 4'

STREET: AVENUE "F" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #5G-5
UPSTREAM 26.0'

OPERATOR: JOE LODEL

OTAL RUN: 26.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

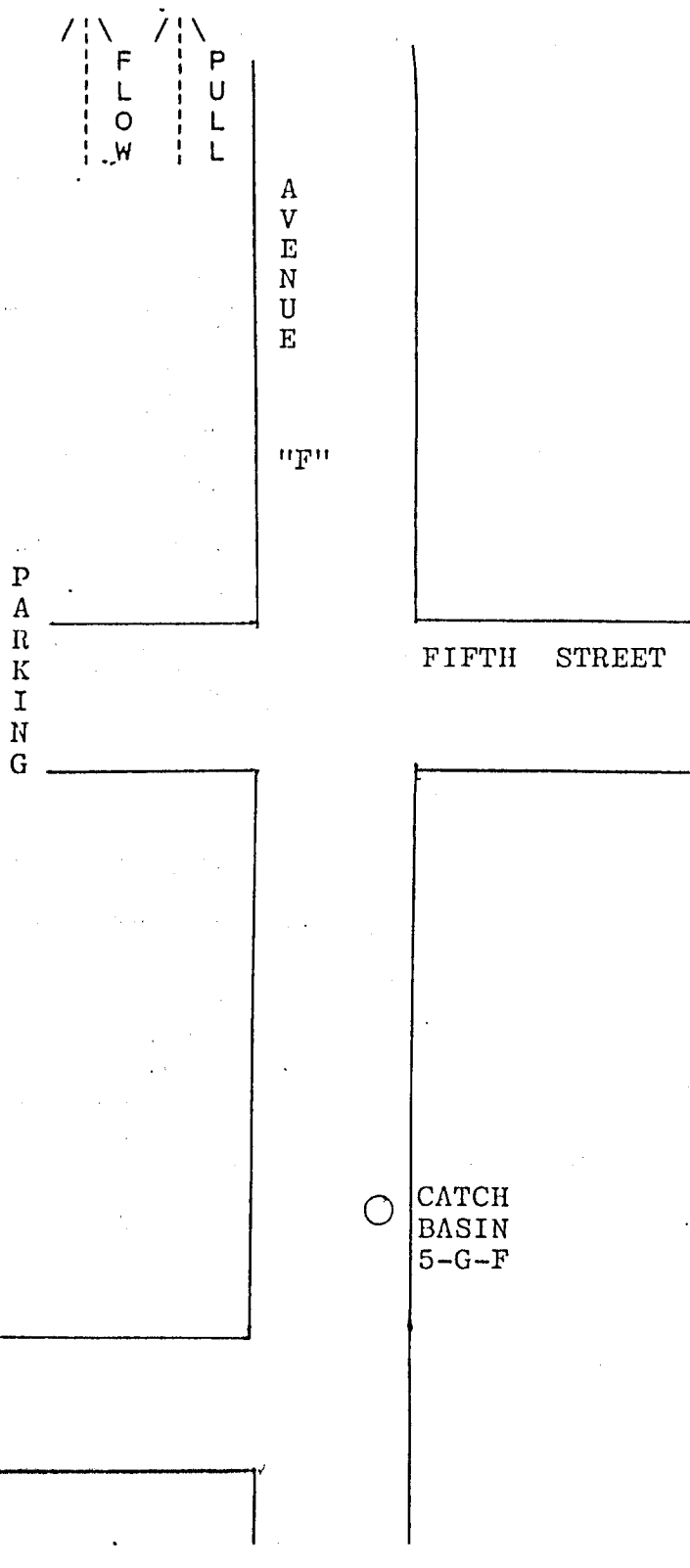
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: FAIR - MATERIAL IN LINE
IS MODERATE

GRADE: FAIR

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
END OF ROD						26.0
END OF RUN						

Pacific Pipeline Survey

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CLIENT: A N WEST

DATE: NOVEMBER 13, 1990 RUN NO: 90

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 4' APPROX MH DEPTH: 4.5'

STREET: FIFTH AVENUE AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #6G-B
UPSTREAM 32.0'

OPERATOR: JOE LODEL

TOTAL RUN: 32.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

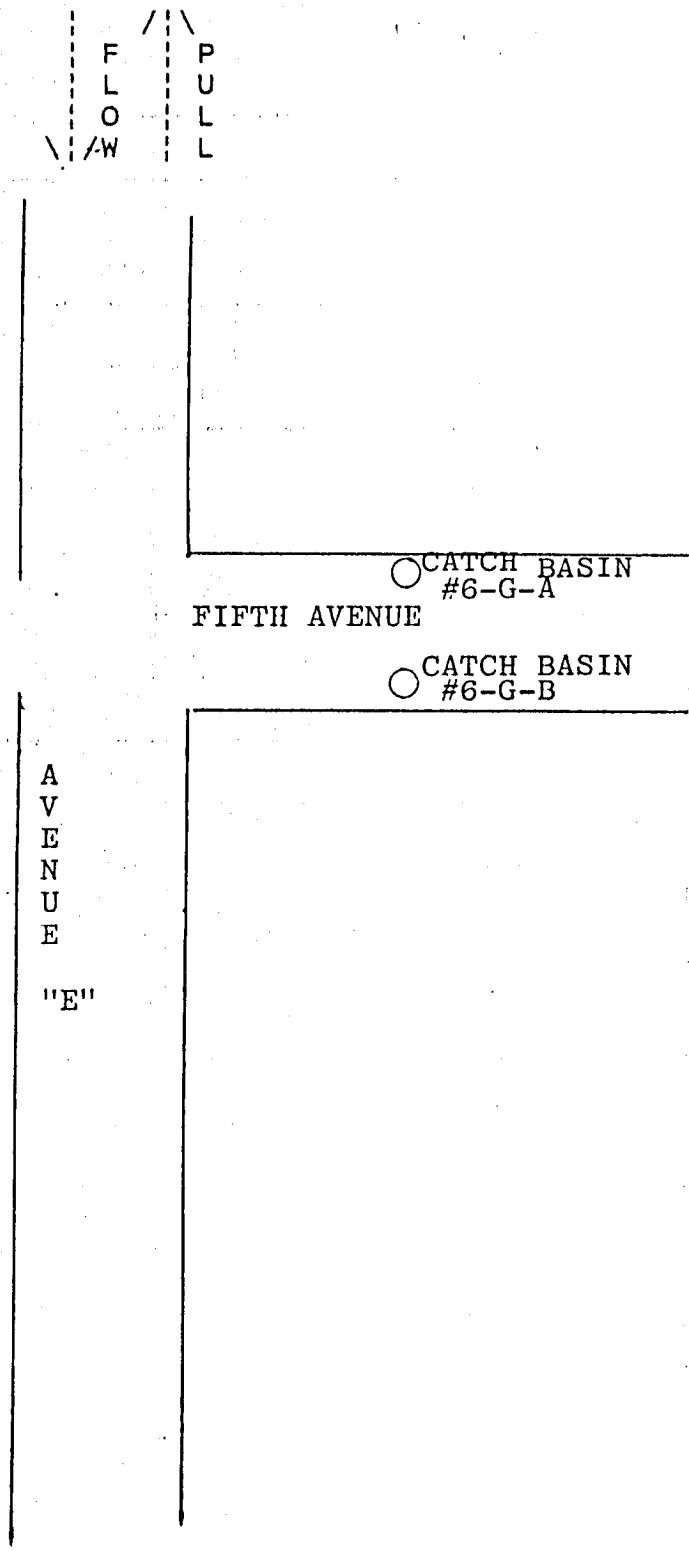
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: 8

PIPE CONDITION: POOR - PIPE IS TOO DIRTY

GRADE: UNKNOWN - DUE TO PIPE CONDITION

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
PIPE HALF FULL OF MATERIAL - COULD NOT PASS						32.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 14, 1990 RUN NO: 91

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 3' APPROX MH DEPTH: 6'

STREET: AVENUE "C" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #10D-2
TO MANHOLE #10D

OPERATOR: TIM McLEAN

TOTAL RUN: 44.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

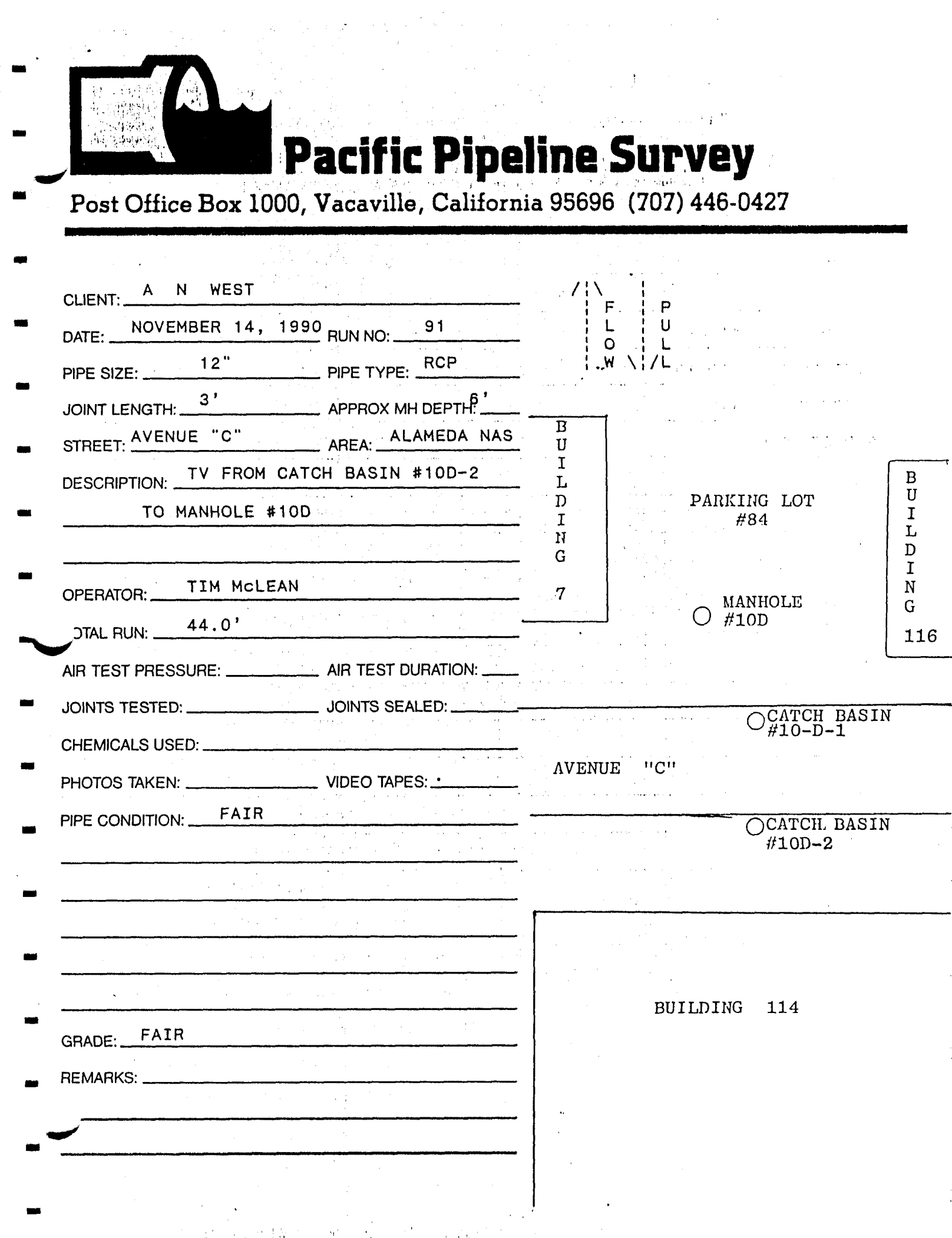
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: FAIR

GRADE: FAIR

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
BREAK						9.5
BREAK						11.0
CATCH BASIN #10D-1						14.5
PIPE CHANGES TO 10"						16.0
CATCH BASIN #10D-2						44.0
END OF RUN						

Pacific Pipeline Survey

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CLIENT: A N WEST

DATE: NOVEMBER 14, 1990 RUN NO: 93

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 3' APPROX MH DEPTH: 9'

STREET: AVENUE "F" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #6G-18
CATCH BASIN #6G-18A

OPERATOR: TIM McLEAN

TOTAL RUN: 47.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

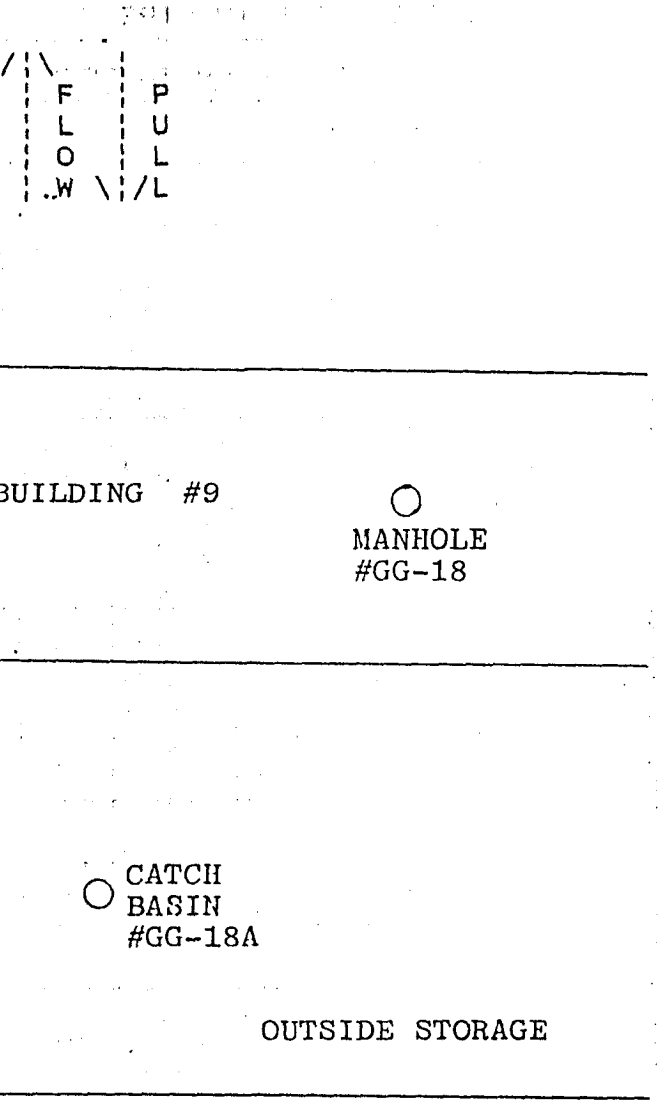
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: FAIR TO POOR - MATERIAL
BLOCKING LINE.

GRADE: FAIR

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
OFFSET						41.0
MANHOLE						51.0
END OF RUN						

Pacific Pipeline Survey

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CLIENT: A N WEST

DATE: NOVEMBER 14, 1990 RUN NO: 92

PIPE SIZE: 10" PIPE TYPE: RCP

JOINT LENGTH: 3' APPROX MH DEPTH: 4'

STREET: THIRD STREET & AVENUE "C" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #9D-1 TO MANHOLE #9D

OPERATOR: TIM McLEAN

TOTAL RUN: 51.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

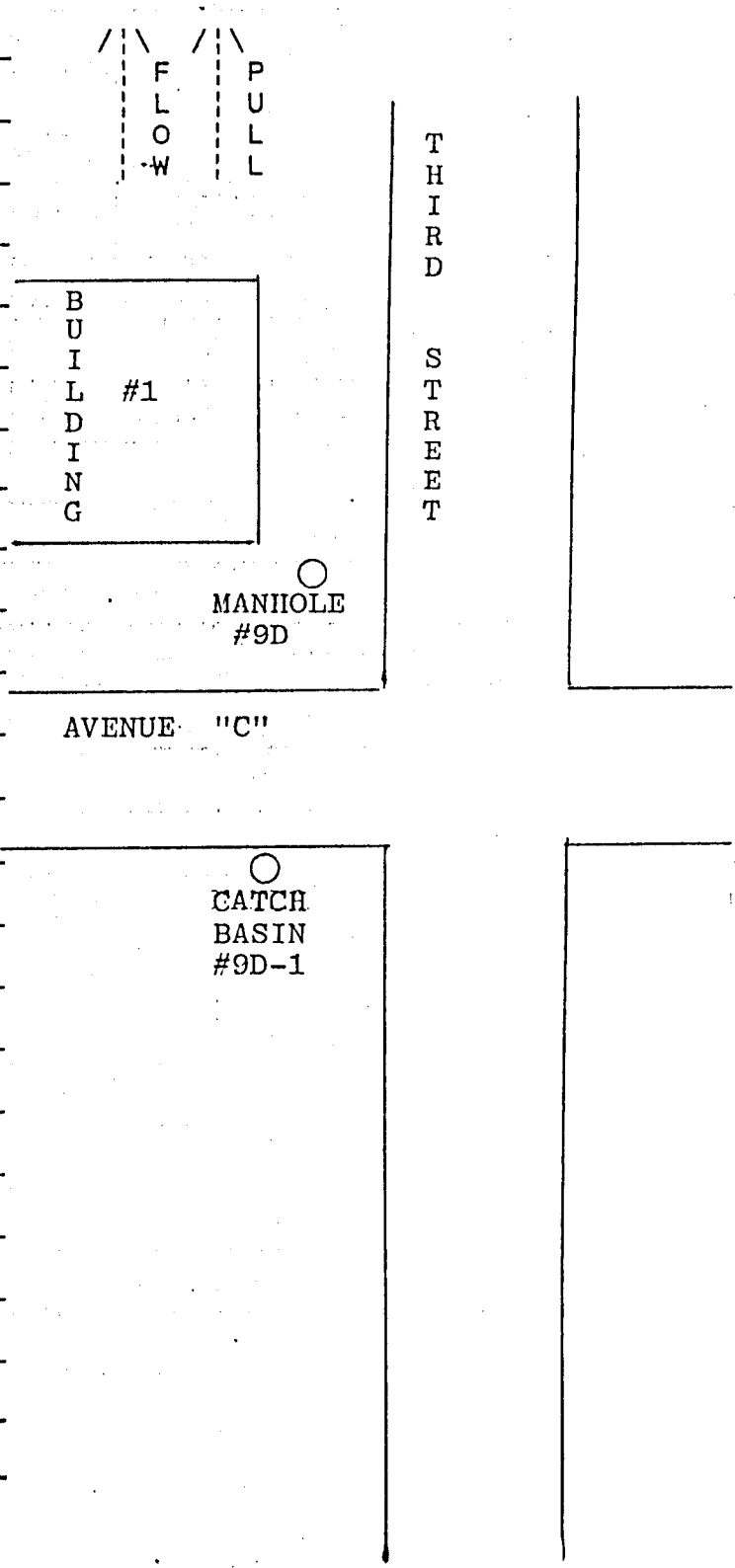
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: FAIR

GRADE: FAIR

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
POSSIBLE HOLE IN PIPE		X			X	35.0
MATERIAL PILED UP IN FRONT OF CAMERA						47.0
END OF RUN						

Pacific Pipeline Survey

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CLIENT: A N WEST

DATE: NOVEMBER 14, 1990 RUN NO: 94

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 3' APPROX MH DEPTH: 10'

STREET: AVENUE "C" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #6G-17
CATCH BASIN #6G-17A

OPERATOR: TIM McLEAN

TOTAL RUN: 30.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

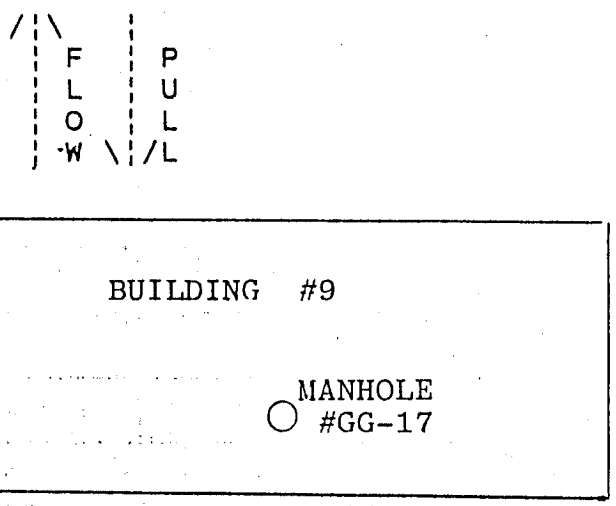
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: FAIR

GRADE: FAIR

REMARKS: LINE HAS MOTOR OIL AND GREASE BUILTUP.



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CATCH BASIN #6G-17A						30.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 14, 1990 RUN NO: 95

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 3' APPROX MH DEPTH: 2'

STREET: AVENUE "F" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #6G-17A
UPSTREAM

OPERATOR: TIM McLEAN

OTAL RUN: 0.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

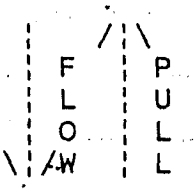
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: FAIR

GRADE: UNKNOWN

REMARKS: LINE HAS GOTASE AND
MATERIAL BUILTUP.



BUILDING #9

CATCH
BASIN
#GG-17A

OUTSIDE STORAGE

BUILDING #92

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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CLIENT WANTED TO JUST LOOK UP PIPE						.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 14, 1990 RUN NO: 96

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 3' APPROX MH DEPTH: 4'

STREET: AVENUE "F" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #6G-16A TO MANHOLE #6G-16

OPERATOR: TIM McLEAN

TOTAL RUN: 29.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

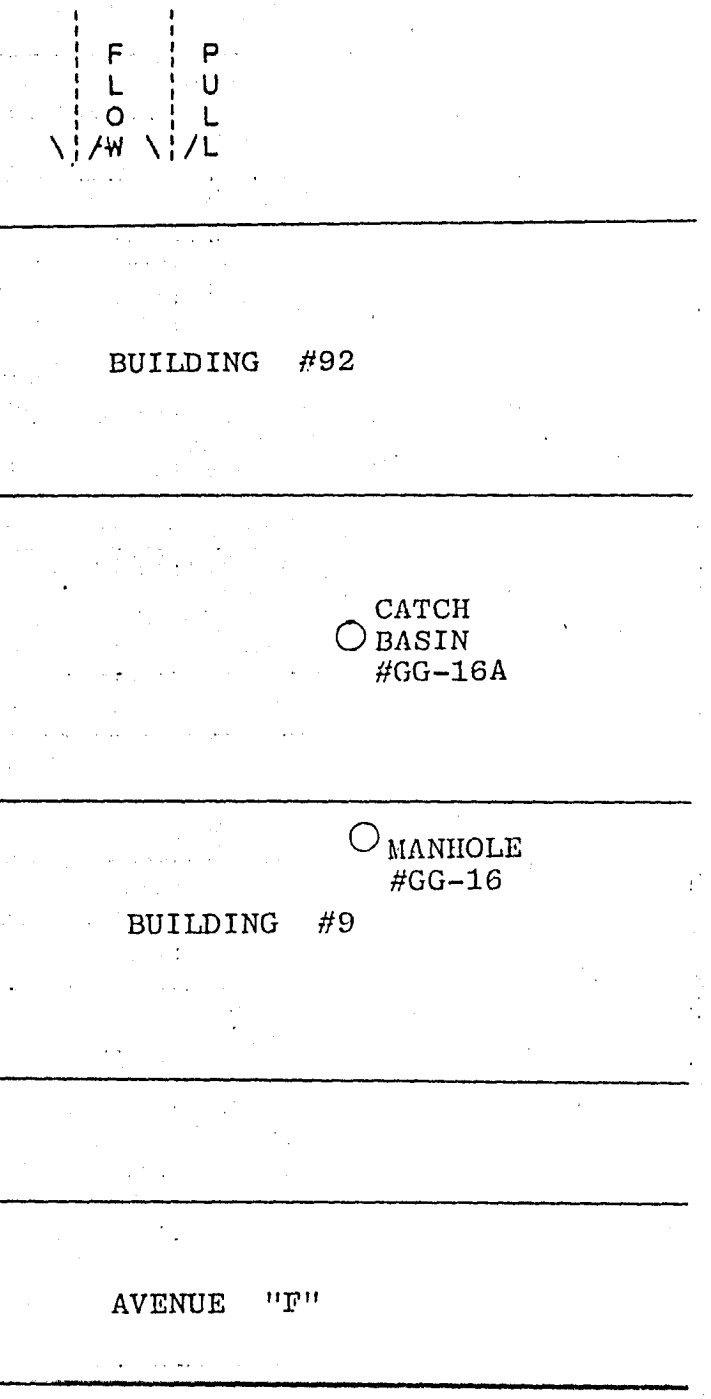
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: POOR - WITH BREAK AT 29'

GRADE: FAIR

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
BREAK - UNABLE TO PASS						29.0
END OF RUN						

Pacific Pipeline Survey

Post Office Box 1000, Vacaville, California 95696 (707) 446-0427

CLIENT: A N WEST

DATE: NOVEMBER 14, 1990 RUN NO: 97

PIPE SIZE: 12" PIPE TYPE: RCP

JOINT LENGTH: 3' APPROX MH DEPTH: 4'

STREET: AVENUE "F" AREA: ALAMEDA NAS

DESCRIPTION: TV FROM CATCH BASIN #6G-16A
UPSTREAM

OPERATOR: TIM McLEAN

TOTAL RUN: 4.0'

AIR TEST PRESSURE: _____ AIR TEST DURATION: _____

JOINTS TESTED: _____ JOINTS SEALED: _____

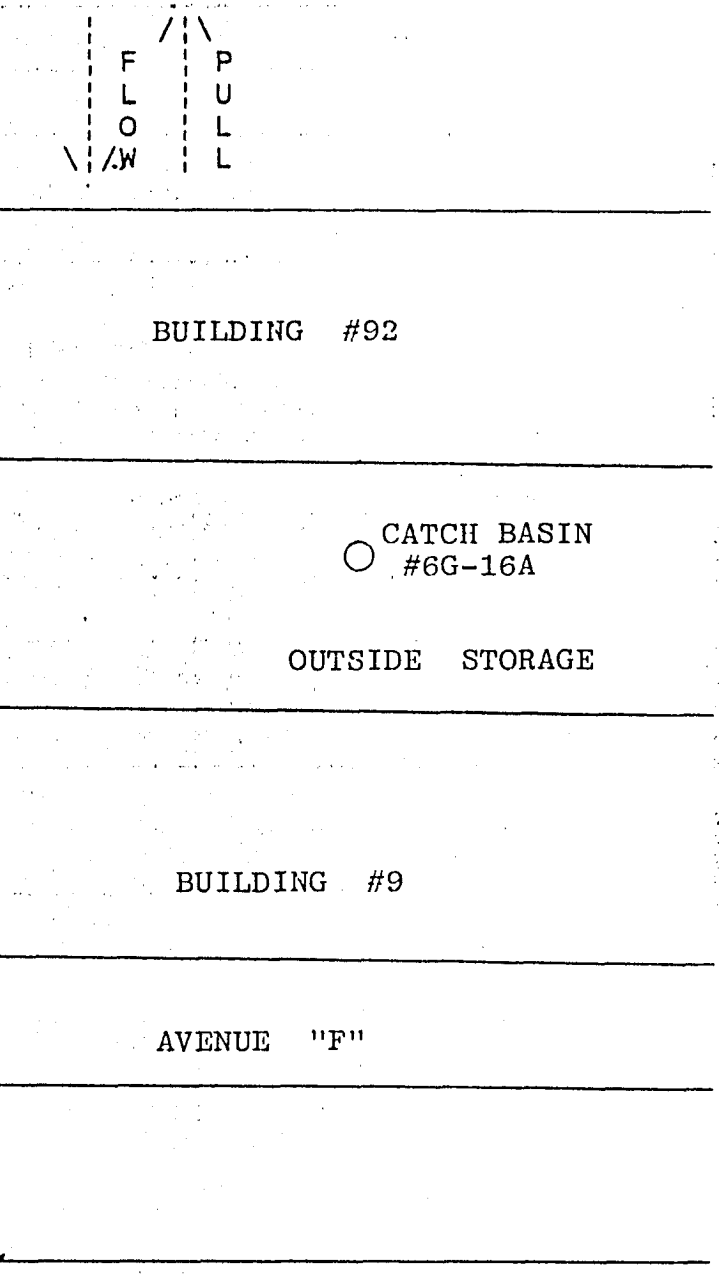
CHEMICALS USED: _____

PHOTOS TAKEN: _____ VIDEO TAPES: _____

PIPE CONDITION: GOOD - WHAT WAS OBSERVED

GRADE: UNKNOWN

REMARKS: _____



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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
CLIENT JUST WANTED TO LOOK UP PIPE						4.0
END OF RUN						

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Client A N WEST

pacific pipeline survey

TV INSPECTION REPORT

REMARKS	Roots Ref. #	QUADRANT 4	3	2	1	FOOTAGE
SEPARATED BREAK						16.0
MAIN LINE						16.0
END OF RUN						