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Passaic Valley Sewerage Commissioners

Interim

Sewer System Inventory and Assessment Report for the Towns of Harrison and Kearny, The Borough of East Newark, and the Cities of Newark and Paterson

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Passaic Valley Sewerage Commissioners

Interim

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February 1996

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for the Towns of Harrison and Kearny,
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I. Purpose and Objectives

The General Permit for combined sewer systems requires the development of a CSO Discharge Characterization Study consisting of a field calibrated and verified Combined Sewer Overflow Model designed to represent the combined sewer system's response to historical events of precipitation. The purpose of the Sewer System and Inventory Report, the requirements of which are outlined in Part V.B.4.c. of the General Permit for Combined Sewer Systems NJPDES No. 0105023, is to provide the system information required for the development of a Storm Water Management Model (SWMM) for each catchment area.

The objectives of this report area are to develop, on a drainage area and system wide basis, the following:

a) a comprehensive inventory of all elements of the combined sewer system including, but not limited to: all sewer lines, regulators, tide gates, diversion chambers, pumping stations, interceptors, trunk sewers, and outfall structures;

b) information upon the operational status, condition, and hydraulic capacity of all facilities; and

c) an overall understanding of the control and transport facilities used to transfer wastewater flows from the combined sewer system to the treatment plant.

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At a minimum the report requires detailed drawings of all regulators, tide gates, and flow diversion structures in plan and profile view and field verification of existing data.

The information provided herein has been developed from existing information and some field verification. Additional, more detailed, information will be developed during the monitoring and modeling studies which will be undertaken as part of the requirements of the general permit. As this information is obtained, the Sewer System Inventory shall be updated to include new data and/or system modifications which are discovered.

The assessment of the combined sewer overflow facilities, which is required under the General Permit, will be conducted, for CSO facilities owned and/or operated by PVSC, by Charles A. Manganaro Consulting Engineers and will be reported upon separately. The assessment of the combined sewer systems, including any control facilities owned and operated by the municipality, is the requirement of the municipality and will also be reported upon separately.

II. Introduction

The Passaic Valley Sewerage Commissioners (PVSC) provide wastewater treatment service to forty-seven (47) municipalities within their north-central New Jersey service district. The PVSC District covers approximately 150 square miles, mostly within the Passaic River drainage basin from Newark Bay to the Great Falls in Paterson. The main interceptor sewer of the PVSC, which begins at Prospect Street in Paterson, generally follows the alignment of the Passaic River to the PVSC Water Pollution Control Facility in the City of Newark. The extent of the PVSC Service District and the area combined sewer areas within the report area is illustrated in Figure 1.

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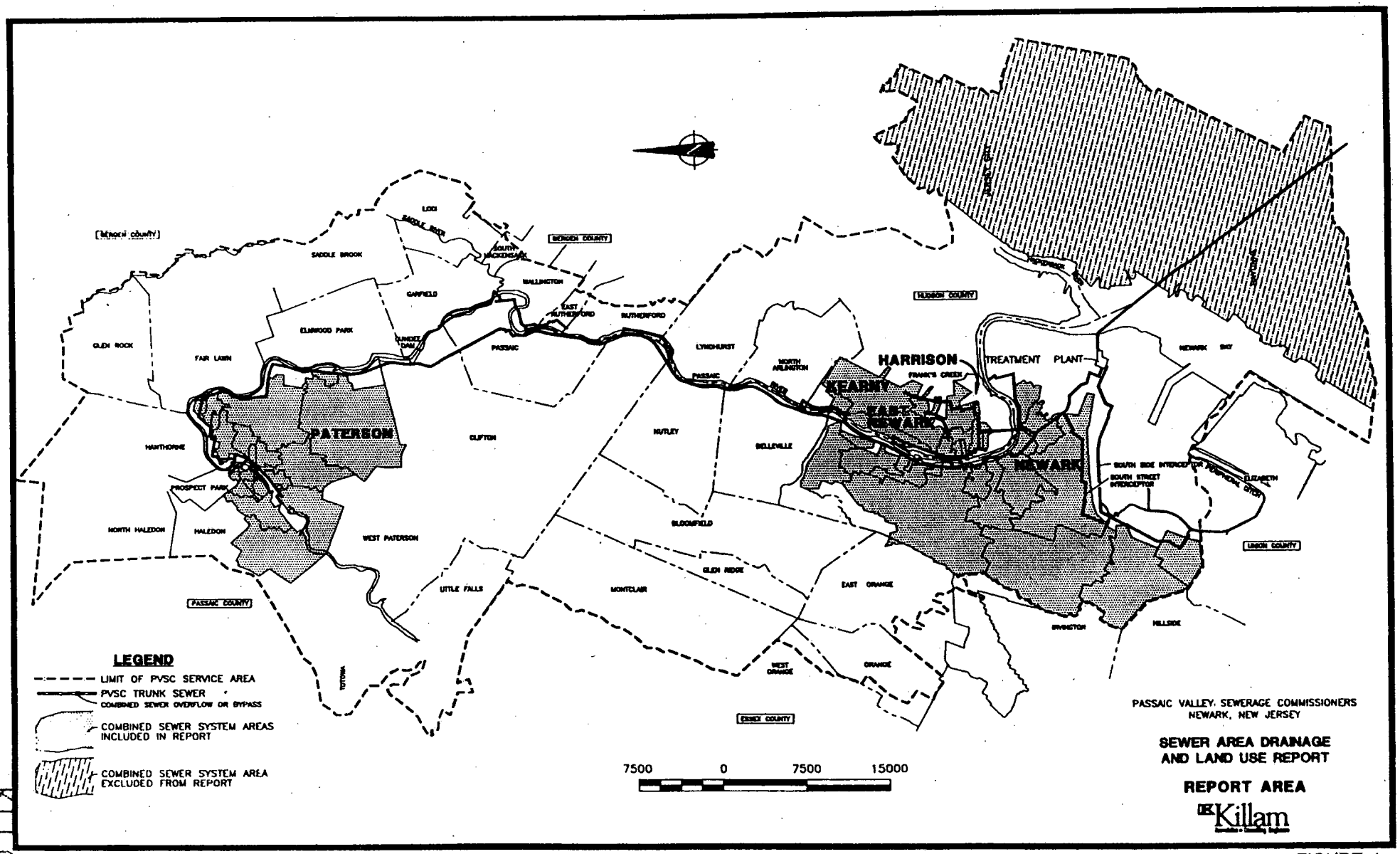

FIGURE 1

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Seven (7) of the municipalities within the PVSC District have combined sewer systems which have received Authorization to Discharge under the General NJPDES Permit for Combined Sewer Systems NJ0105023. Two of the combined sewer municipalities, the Cities of Bayonne and Jersey City, own and operate their own combined sewer systems, interceptors, CSO Control Facilities, and pumping stations, and jointly own the force main used to transport wastewater to the primary clarifiers at the PVSC treatment plant in Newark. The PVSC does not have any combined sewer overflow control or transportation facilities which service this section of the District. Consequently the Cities of Bayonne and Jersey City will be undertaking their own Discharge Characterization Studies.

The other municipalities with combined sewer systems include the Towns of Harrison and Kearny, the Borough of East Newark and the Cities of Newark and Paterson. All of these municipalities are tributary to PVSC interceptors and most of their combined sewer systems are tributary to CSO control facilities owned and/or operated by PVSC. Accordingly PVSC has offered to undertake the CSO Discharge Characterization Study, including the Sewer System Inventory, on behalf of the Towns of Harrison and Kearny, the Borough of East Newark, and the Cities of Newark and Paterson. The system analysis portion of this report shall be restricted to those portions of the combined sewer system which are owned and/or operated by PVSC. This includes the PVSC combined sewer control facilities and the PVSC Interceptor.

III. Service System Inventory

1. Previous Studies

The Passaic Valley Sewerage Commissioners conducted a Combined Sewer Overflow

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Analysis (Overflow Analysis) in the mid-1970's of all combined sewer control facilities and bypasses which discharge to the Passaic River. The work was undertaken as part of the District's Phase 1 Sewer System Evaluation Survey by Killam Associates and was reported upon in a Report to the Passaic Valley Sewerage Commissioners in 1976. The study developed detailed background information upon each of the PVSC combined sewer control facilities including the physical size and hydraulic characteristics of the regulator. In addition to the physical characteristics of the subcatchment and control facility, monitoring of each regulator was conducted to develop base information upon dry and wet weather flows and water quality. The Overflow Analysis was used as a principal source of information in the development of this report.

Since the time of the Overflow Analysis, the PVSC has entered into an agreement with the City of Newark to operate the South Side Interceptor which was not evaluated nor modeled under previous studies. The South Side of Newark includes three (3) major CSO drainage basins (Peddie, Queen and Waverly) covering over 3,000 acres which discharge to the Peripheral Ditch surrounding the airport. The information developed under the Overflow Analysis has been updated and modified to include those areas tributary to the South Side Interceptor.

2. Additional Information

The Sewer System Inventory and Assessment Report does herein incorporate by reference the **Passaic Valley Sewerage Commissioners Combined Sewer Systems for East Newark, Harrison, Kearny, Newark and Paterson, Facilities Inventory Sewer Service Area Maps**

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dated February 1996, and the **Passaic Valley Sewerage Commissioners Combined Sewer Overflow Facilities Plan, Profile of Major Interceptors**. Both of the above referenced documents provide significant information on the combined sewer systems tributary to CSO Control Facilities.

3. General Information

The combined sewer systems within the Passaic Valley Sewerage Commissioners District were originally designed to discharge untreated wastewater into the Passaic River and Newark Bay. The Passaic Valley Sewerage Commissioners constructed transport and treatment facilities between 1912 and 1924 to provide primary treatment of wastewater from municipalities along the Passaic River from Newark to Paterson. In addition to a system of interceptors to transfer the wastewater to the sewage treatment plant in Newark, flow control structures or regulators were constructed to divert the wastewater from the municipal combined sewer systems to the interceptor. The flow control structures also had the function of preventing surcharging of the interceptor by restricting or closing the regulator gate to the interceptor and diverting the flow to the original outfall to the Passaic River during periods of rainfall.

A typical PVSC combined sewer overflow control facility is illustrated in Figure 2. Under dry weather conditions wastewater enters the sandcatcher and is diverted by an overflow weir through an orifice to the regulator chamber and then to the interceptor. The sandcatcher is used to collect grit from the system and to prevent its entrance into the interceptor system. As flow height in the sandcatcher increases, it exceeds the height of the overflow weir and excess

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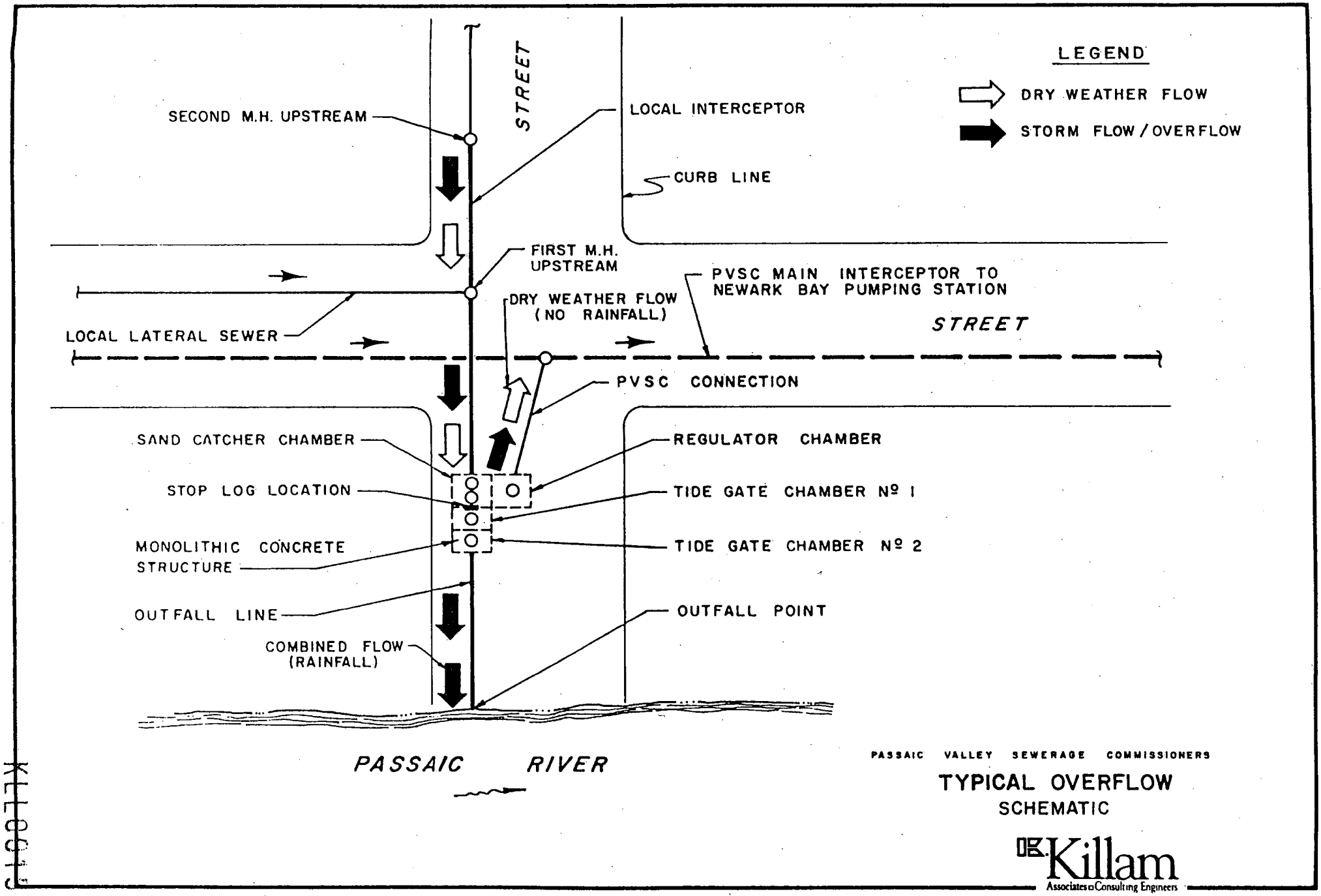

Figure 2

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flow is discharged as a combined sewer overflow. In most cases, a tide gate chamber is located between the receiving waters and the sandcatcher to prevent the entrance of extraneous waters into the interceptor system. In addition, manual flap valves are located in most sandcatcher chambers which allow for manual closure of the regulator valve if needed.

Most of the PVSC combined sewer control facilities in Newark have been modified to allow the Water Pollution Control Facility on Wilson Avenue in Newark to control flow to the interceptor during period of significant precipitation. The PVSC CSO Control Facilities along the Main Interceptor in Newark have been modified to use sluice gates to control flow into the interceptor. In this manner, stormwater flows from the City of Newark can be diverted away from the interceptor to allow adequate flow capacity to upstream combined and separate sewer areas under high storm flow conditions.

The PVSC CSO control facilities and interceptors included sixty-three (63) combined sewer overflow regulators and approximately 185,000 linear feet of interceptor sewer servicing both combined and separate sanitary sewer systems in forty-seven (47) municipalities. The extent of the PVSC District includes combined sewer systems on both ends of the Main Interceptor system, with the City of Paterson at the head end of the interceptor and the City of Newark at the bottom. In addition to the control and interceptor sewers originally owned and operated by the PVSC, the Commissioners have entered into an agreement with the City of Newark to operate the South Side Interceptor Sewer which has three (3) CSO overflow control facilities to regulate the flow from the South Side of Newark to the PVSC Water Pollution Control Facilities on Wilson Avenue.

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In addition to the PVSC CSO control facilities there are a number of CSO points which have control facilities owned and operated by the City of Paterson or the City of Newark. These will be evaluated by the individual City but are referenced since they are located within the drainage basins for PVSC control facilities and interceptors. The PVSC control facilities and interceptor system are illustrated on Figure 2 for those transport facilities servicing the City of Paterson. Also illustrated are the discharge points for the City of Paterson CSO control facilities. Similarly, the PVSC control facilities and interceptor system for the Kearny, East Newark, Harrison, and Newark Area, including City of Newark CSO discharge points are illustrated on Figure 3.

3.1 The PVSC Interceptor System

The intercepting system owned and operated by the PVSC services forty-five (45) municipalities within the District. The only two municipalities within the District which do not discharge to these facilities are the City of Bayonne and Jersey City. These municipalities joined the PVSC District recently and have their own force main to transfer flow to the PVSC Water Pollution Control Facility in Newark.

The **1973 Report on Proposed Sewerage Facilities Volume 1** completed for the Passaic Valley Sewerage Commissioners by Charles A. Manganaro Consulting Engineers., included a detailed review of existing records and an analysis of existing flows and the capacity of the PVSC Interceptor System. This analysis furnished information concerning the location, size, shape, length, and average slope of each interceptor branch as well as details about the

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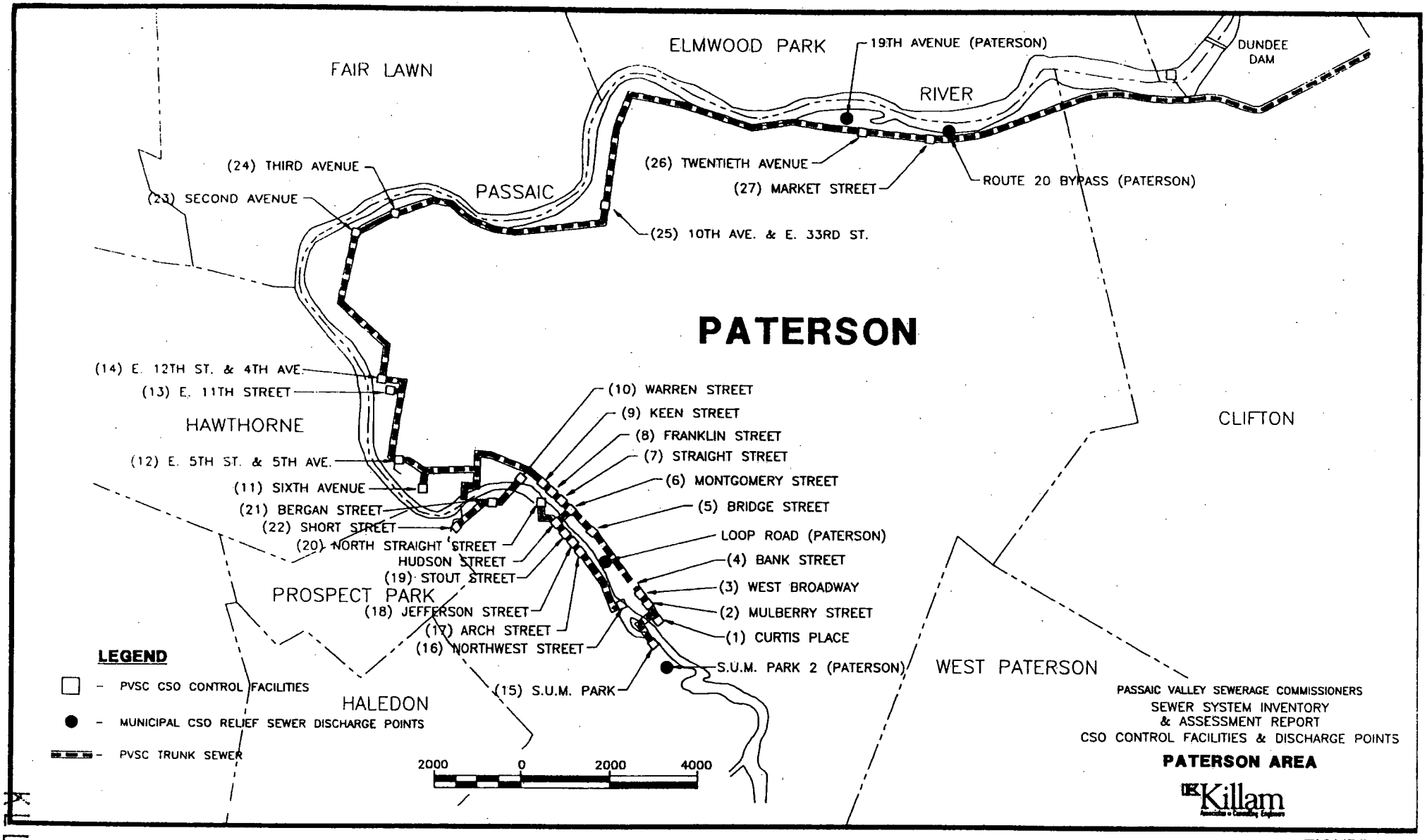

FIGURE 2

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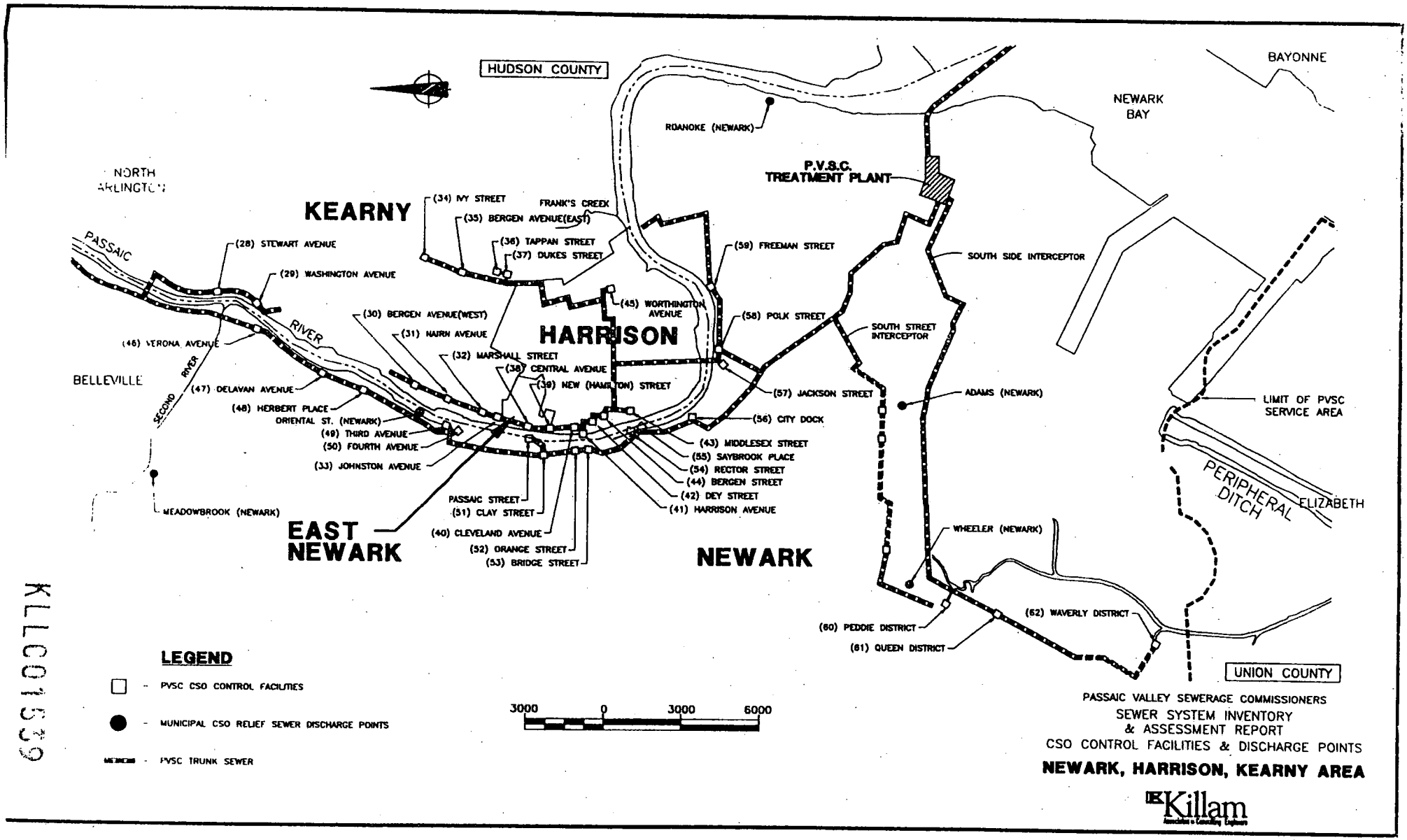

FIGURE 3

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municipalities and sewer systems tributary to various segments. The interceptor analysis also made projections upon the peak flow anticipated in the year 2040. A complete reproduction of the Charles A. Manganaro, Inc. report upon the existing interceptor system is included as Appendix A to this report.

The Passaic Valley Sewerage Commissioners are updating the existing analysis of the main and branch interceptor which is anticipated to be completed in the later part of 1996. Inspections are being conducted at approximately 300 manholes within the system to evaluate the structural condition of the sewer as well as to determine whether construction plans which were used in the 1974 analysis are accurate. The information developed under this project will be used to develop, calibrate, and verify a hydraulic model of the interceptor system which will provide PVSC with the ability to meet the requirement contained in the draft NJPDES permit to maximize flows from the combined sewer system to the Water Pollution Control Facility in Newark.

3.2 PVSC CSO Control Facilities

There are presently sixty-three (63) combined sewer overflow control facilities which are owned and/or operated by PVSC. The facilities are located in the Cities of Newark and Paterson, the Towns of Harrison and Kearny, and the Borough of East Newark. Three (3) of the combined sewer overflow facilities are owned by the City of Newark, but operated by PVSC. These include the Peddie, Queen, and Waverly regulators which are tributary to the South Side Interceptor and discharge to the Peripheral Ditch which surrounds Newark Airport.

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All of the combined sewer overflow control facilities, with the exception of the Peddie, Queen, and Waverly were investigated and evaluated in detail during the **Overflow Analysis** conducted by Killam Associates in 1976. Reproductions from the **Overflow Analysis** are included in Appendix B of this report for each of the sixty (60) combined sewer overflow points evaluated at that time. Broken down by municipality and drainage basin, the report provides a general background into combined sewer systems in each municipality as well as a narrative, graphical, and tabular data upon the system characteristics of each drainage basin and control facility.

The following list provides a general description of the information available in Appendix B and the order in which it can be located:

a. Plate A - **Plan and Profile** of the combined sewer control facility;

b. Plate B - **Contract Drawings** of the combined sewer control facility;

c. Plate C - A **Schematic** of the control facility operations;

d. Plate D - **Plan of Collection System** showing service area for the combined sewer overflow control facility.

Additional information on each CSO drainage basin is provided in the Drainage Area & Land Use Report for the CSO municipalities in the PVSC District.

It is anticipated that dry weather flows and water quality will be obtained from each of the drainage areas during the development of the Storm Water Management Model (SWMM). In

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addition, PVSC is currently undertaking an additional analysis of the operating, hydraulic, and structural condition of the PVSC control facilities and interceptor system. As this work is completed , the information contained herein will be modified as required. It is anticipated that the basic information provided on each drainage basin will not change since this information was developed and field verified at the time of the **Overflow Analysis.**

3.3 Theoretical Flow Capacity Analysis

The capacity relationship of the municipal collector sewers, CSO control facilities, and interceptors will determine the overall capacity of that section of the combined sewer system and the frequency of an overflow event. The EPA's Nine Minimum Control Standards for CSOs, which has been incorporated in the PVSC discharge permit, requires the maximization of flow to the treatment plant during wet weather events. While it is known that the municipal collector sewers have a much greater flow capacity than the regulator or interceptor, it is important to recognize locations wherein the regulator or interceptor capacity is not being fully utilized during wet weather events. Maximization of flow to the interceptor system will reduce the combined sewer overflow discharge volume to the receiving water and can thus reduce the overall pollutant impacts at minimal or no additional cost.

The Passaic Valley Sewerage Commissioners are currently undertaking a detailed investigation of the PVSC interceptor system to evaluate the overall carrying capacity of main and branch interceptors. A mathematical model will be developed to allow for the analysis of this complex system. The development of this model will allow the PVSC to better understand its transport system and to evaluate whether it is being fully utilized during wet weather events.

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This information can then be used to determine where and what types of system or operating modifications will be necessary to comply with this requirement.

Notwithstanding the above, a theoretical capacity analysis of the municipal collector sewers, regulators, and interceptors has been developed to provide some understanding of the hydraulics of the regulator and interceptor system. Three (3) tables have been developed using existing information from past reports and analyses. Each table provides information upon the drainage basin, control facility name, drainage basin, collector sewer size, shape and capacity, an estimate of the regulator capacity and information on the size and capacity of the interceptor.

The regulator capacity provided in these tables was developed in the **Overflow Analysis**. The flow rate given represents that flow rate which will produce an overflow. While the regulator capacity is actually slightly less than the flow rate provided, this flow rate provides a good estimate of the regulator capacity under actual storm flow conditions. The interceptor capacity is based upon theoretical flow determinations provided in the Charles Manganaro interceptor analysis included in Appendix A, while the collector sewer capacity adjacent to the control facility is based upon plan and profiles in the **Overflow Analysis** or the **Profile of Major Interceptors** previously referenced.

The theoretical flow capacity analysis has been broken down into three (3) tables. Information on the collectors, regulators and interceptors servicing the City of Paterson is

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provided on Table 1, for the Harrison, Kearny and East Newark Area on Table 2, and the City of Newark on Table 3. As previously indicated the capacities shown are based upon free flow conditions and may not truly represent the hydraulics of the system under actual conditions. The land side and interceptor models which will be developed should provide a much better understanding of the dynamics of the PVSC transport system and will be used to update and supersede this theoretical analysis.

4. Municipal CSO Control Facilities

In addition to the CSO control facilities which are owned and/or operated by the Passaic Valley Sewerage Commissioners, there are combined sewer overflow control facilities which are owned and operated by individual municipalities. Both the City of Newark and Paterson own and operate control facilities which are located upstream of the PVSC regulator and interceptor system. The municipal controls were constructed under various projects to provide hydraulic relief to areas which were prone to street flooding or backups due to surcharging of the combined sewer system.

The City of Newark is currently undertaking a study of the combined sewer facilities which are owned and operated by the City. Information on the location of these facilities is provided on the **Facilities Inventory Sewer System Map** prepared by PVSC, while profiles of several of the major combined sewer overflow control facilities tributary to the Adams Street discharge pipe are shown on **Combined Sewer Overflow Facility Plan, Major Interceptor Profiles** which was prepared during the CSO Facilities Plan in 1983. Additional information compiled by the City of Newark will be incorporated into this report when the information is made

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Table 1
Theoretical Flow Capacity Analysis
Collector Sewers, Control Facilities, and Interceptors
servicing the
City of Paterson

PVSC CSO Permit Number	Sub Area	Control Facility Name	Drainage Area (Acres)	Collector Sewer Pipe Size (inches)	Collector Sewer Pipe Shape	Collector Sewer Capacity (MGD)	PVSC Regulator Capacity (MGD)	PVSC Interceptor Pipe Size (inches)	PVSC Interceptor Shape	PVSC Interceptor Capacity (MGD)
1	A1 & AA	Curtis Pl.	1214	72	circular	300.0	18.8	30	round	*
15	A2	SUM Park	47	30	circular	11.3	1.5	16	round	3.8
2		Mulberry St.	2	24	circular	21.3	2.0	45	round	20.8
3		West Broadway	4	18	circular	3.9	4.5	45	round	20.8
4		Bank St.	1.5	18	circular	5.2		45	round	20.8
5		Bridge St	15	52 x 31 (42)	brick arch	47.2	10.9	45	round	20.8
Hudson Street Siphon										
16	B1	Northwest St.	242	72	circular	330.0	15.0	30	circular	7.8
17		Arch St.	32	18	circular	0.0	2.3	30	circular	7.8
18		Jefferson St.	38	20 x 30 (24)	brick egg	7.8		30	circular	7.8
19		Stout St.	15	18	circular	34.2		30	circular	7.8
20		No. Straight St.	82	30 x 45 (36)	brick egg	25.8		15	circular	2.7
siphon		Hudson St.	148						siphon	12.3
6	F	Montgomery St.	374	60	circular	122.0	25.0	57	circular	35.9
7	G1,G2	Straight St	112	48	circular	94.0	10.9	57	circular	39.9
8		Franklin Street	2	12	circular	4.0		57	circular	39.9
9	H	Keen Street	17	24	circular	10.0	8.1	57	circular	39.9
10	CC	Warren St.	104	20 x 30 (24)	brick egg	25.6	18.7	30	circular	10.1
21		Bergen St	11	18	circular	31.0	8.1	24	circular	4.9
22	C	Short St	32	30 x 45 (36)	brick egg	51.7	5.7	24	circular	4.9
11	J	6th Ave.	41	18	circular	5.2	8.3	15	circular	*
12	K	5th St. & 5th Ave.	8	24	circular	6.0	12.5	65	horseshoe	46.4
13		E. 11st Street	103	36	circular	44.1	6.1	18	circular	*
14		E.12th St. & 4th Ave	25	30	circular	38.1	12.2	65	horseshoe	46.6
23	Y	2nd Ave.	26	20 x 30 (24)	brick egg	17.6	10.1	65	horseshoe	49.8
24	N	3rd Ave.	66	24 x 36 (30)	brick egg	29.2	8.3	65	horseshoe	49.8
25	R&S	Tenth Ave. & 33rd St	694	40 x 60 (48)	brick egg	125.0	15.0	65	horseshoe	57.4
				72	circular	172.0				
26	U	20th Ave.	62	60	circular	11.9	5.4	72	horseshoe	59.4
27	V1&V2	Market St.	1461	84	circular	180.0	37.7	81	horseshoe	81.5

Note: For Non-circular Pipe ( ) represents the equivalent circular pipe diameter
* Not Available - See Appendix A

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Table 2
Theoretical Flow Capacity Analysis
Collector Sewers, Control Facilities, and Interceptors
servicing the
Harrison, Kearny and East Newark Area

Municipality	PVSC CSO Permit Number	Sub Area	Control Facility Name	Drainage Area (Acres)	Collector Sewer Pipe Size (inches)	Collector Sewer Pipe Shape	Collector Sewer Capacity (MGD)	Regulator Capacity (MGD)	PVSC Interceptor Pipe Size (inches)	PVSC Interceptor Shape	PVSC Interceptor Capacity (MGD)
Kearny	31	B	Nairn St.	157	18	circular	5.7	3.2	18	circular	*
Kearny	32		Marshall St	19	15	circular	2.9	2.5	18	circular	*
Kearny	33	B	Johnston St.	250	40 x 60 (48)	brick egg	91.2	7.3	33	circular	9.4
East Newark	38	A	Central Avenue	55	30 x 45 (36	brick - egg	59.5		36	circular	10.6
Harrison	40		Cleveland Ave.	16	20	circular	31.7	3.2	36	circular	*
Harrison	41	A	Harrison Ave.	84	30 x 45 (36)	brick - egg	26.2	5.8	36	circular	*
Harrison	42		Dey St.	2	12	circular	1.7	2.9	36	circular	*
Harrison	43	A	Middlesex St.	64	24	circular	8.3	3.6	15	circular	*
Kearny	34	C	Ivy St.	831	84x108	elliptical brick	400		36	circular	*
Kearny	35		Bergen Ave.	110	30	brick	22.6	1.6	36	circular	*
Kearny	36		Tappan St.	54	24	circular	7.8	2	12	circular	*
Kearny	37		Dukes St.	18	24	circular	12.2	2	42	circular	16.6
									48	circular	*
Harrison	45	A	Worthington Ave.	208	24	circular	6.4	5.9	12	circular	*
Harrison	44		Bergen St.	38	24	circular	10.8	4.4	48	circular	*
Kearny	28		Stewart St.	39	18	circular	19.5	3.1	12	circular	*
Kearny	29		Washington St.	10	18	circular	20	1.8	12	circular	*

Note: For Non-circular Pipe ( ) represents the equivalent pipe diameter
* Not Available - See Appendix A

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Table 3
Theoretical Flow Capacity Analysis
Collector Sewers, Control Facilities, and Interceptors servicing the City of Newark

PVSC CSO Permit Number	Sub Area	Control Facility Name	Drainage Area (Acres)	Collector Sewer Pipe Size (inches)	Collector Sewer Pipe Shape	Collector Sewer Capacity (MGD)	PVSC Regulator Capacity (MGD)	PVSC Interceptor Pipe Size (inches)	PVSC Interceptor Shape	PVSC Interceptor Capacity (MGD)
46	B	Verona Ave.	370	56	Circular	93.8	19	126	Horseshoe	214
47	D	Delevan St.	55	10	Circular	1.75	-	126	Horseshoe	214
				12	Circular	1.8	-	126	Horseshoe	214
48	E	Herbert Pl.	241	48	Circular	157	5.8	126	Horseshoe	266
49		Third St.	3	15	Circular	1.87	2.9	135	Semi-Ellip	266
50	F1	Fourth Ave.	200	42	Circular	134	3.6	135	Circular	266
51	J,J1,J2,K	Clay St.	1739	111"x81"	Semi-Ellip	North - 395	73	135	Circular	266
				111"x81"	Semi-Ellip	South - 395	73	135	Circular	266
-	F	Passaic St.	27	18	Circular	5.26	4.8	18(Branch)	Circular	*
52		Orange St.	8	18	Circular	6.4	4.8	135	Circular	267
				15	-	9.8	4.8	135	Circular	267
53		Bridge St.	10	15	Circular	6.26	-	135	Circular	267
54		Rector St.	128	54"x66"	Vert. Ellip	185	11	135	Circular	267
55		Saybrook Pl.	287	90"x80"	Horiz. Ellip	370	17	135	Circular	267
				48"	Circular	86	17	135		
56	B	City Dock	397	108"x90"	Rect.	432	22.7	141	Circular	272
57		Jackson St.	90	56"x64"	Ellip.	70	11.7	54(Branch)	Circular	*
58	B	Polk St.	201	84"x96"	Ellip.	190	10.5	48(Branch)	Circular	*
59	C	Freeman St.	116	30"x40"	Ellip.	18	17.3	48(Branch)	Circular	*
60	SS1	Peddie District	1745	84"x132"	Rect.	400	96	60(Branch)	Circular	38
				84"x162"	Rect.	321	96	60(Branch)	Circular	38
61	SS2	Queen District	1066	60"x102"	Rect.	73.4	72	66	Circular	49
62	SS3	Waverly District	316	36"	Circular	11.2	74	54	Circular	28

* Not Available - See Appendix A

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available.

The City of Paterson will shortly be undertaking additional investigations of its combined sewer system to develop a Solids and Floatable Control Plan for CSO discharges within the City. As part of the Plan of Study, which has been submitted and approved by NJDEP, the City will undertake and develop detailed information, including plan and profiles and hydraulic capacity determinations, of the combined sewer overflow control facilities and discharge pipes. The City has recently obtained its grant under the Sewage Infrastructure Improvement Act and should be undertaking this work within the near future. Information developed under this project will supplement the sewer system inventory presented under this report.

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Appendix A

Existing Interceptor System

as reported upon in the

1973 Report On

Proposed Sewerage Facilities

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CHAPTER V

EXISTING INTERCEPTING SYSTEM

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General

The intercepting system presently owned and operated by the Passaic Valley Sewerage Commissioners accepts flow from thirty municipalities in four counties. The population served is presently approaching 1,200,000, and there are over 3,000 commerical and industrial establishments served.

For the purposes of this report, the intercepting system is defined as including the main intercepting sewer with twelve branch intercepting sewers and with river crossings, regulators and metering installations, manholes and other appurtenances. There are two major upstream pumping stations, located at Clifton (Yantacaw) and at Wallington (now in Passaic) in addition to the main pumping station at Newark. The treatment plant (including the Newark Bay Pumping Station) and the outfall system are analyzed separately in Chapters VI and XIV.

As indicated in Chapter IV, flow from the municipal collection systems, including domestic sewage, industrial waste, and storm flow from combined sewers, is discharged into the branch interceptors for conveyance to the treatment plant at Newark via the main interceptor or is discharged directly into the main intercepting sewer. Indirect connections are made to certain municipalities, namely East Orange, Haledon, Little Falls, Saddle Brook, and South Hackensack, since their flows are connected through collection facilities owned by others. There are, in addition, direct connections from a number of industries whose flow is of such magnitude or whose location is so situated that direct connection to the PVSC intercepting system was necessary and desirable.

Combined storm and sanitary collection sewers exist in Newark, Paterson, Orange, Harrison and Kearny. Tributary flows from these systems therefore pass through regulating chambers, where excessive peak storm flows may be bypassed to the river in order to avoid surcharging the system capacity.

The remaining municipal collection systems consist of separate sanitary and storm sewers. In these cases, storm water regulation is unnecessary. However, since infiltration rates and discharge from illicit connections can result in increased flows during wet weather periods, it should be recognized that even separate municipal systems may discharge flows at a higher rate during wet periods.

For basic population data and for a basic analysis of tributary flows, reference is made to Chapters III and IV, respectively.

The original intercepting system was constructed during the period between 1912 and 1924. Accordingly, the system, now approaching 60 years of age, lacks capacity for present flows and is showing some signs of deterioration. Since the original design year for ultimate flows was projected as 1940, it is understandable that

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the present system usage far exceeds the concepts developed by the original design engineers.

System deficiencies include the following (in decreasing order of importance):

--Inadequate capacity, particularly in the more northerly (upstream) reaches.
--Debris accumulation, particularly in the Paterson area, where failures have occurred in the Paterson collecting system and materials have been washed into the collecting sewer.
--Possible structural failure in the main interceptor, such as that which recently occurred along McCarter Highway in Newark.
--Deterioration of appurtenances, particularly in the regulating chambers.
--Minor leakage, particularly at joints in the conduits.

In order to adequately review the intercepting system conditions, the following procedures were followed (as detailed in subsequent sections):

(a) Records of the system were examined with particular attention to the original design concepts and record drawings.
(b) PVSC were consulted as to their experience with the system and observations made during recent years.
(c) Field investigations were made to observe typical conditions.
(d) A complete hydraulic analysis was made of the intercepting system, noting capacity deficiencies, ground water conditions, and points of intercepted storm flow.
(e) Present operating procedures were reviewed and considered in connection with future improvements.
(f) System deficiencies were outlined preparatory to an analysis of recommended improvements.

Main Intercepting Sewer

The existing main intercepting sewer is approximately 112,000 feet (over 21 miles) in length and extends from the Newark Bay Pumping Station in Newark to Prospect Street in Paterson, generally following along the west bank of the Passaic River.

The intercepting sewer was constructed of monolithic concrete (poured in place, rather than precast). The hydraulic shape varies from horseshoe to circular, depending on its size and location, and whether it was installed by tunnel or open-cut construction methods (see Plate V-P-6).

As may be noted from the maps on Plates V-P-1 through 4, flow enters the interceptor from a number of branch intercepting and local sewers. Meters (described in Chapter XVII) are of several types, including weirs, flumes, and Venturi tubes.

The regulators (also separately described) are located on combined sewers and are intended to served the function of bypassing storm water during wet weather periods.

At its lower end in Newark, the main intercepting sewer is of horseshoe shape, with a height of 12.50 feet. Through Newark, the interceptor has a depth of cover from 15 feet to over 40 feet (see profiles on Plate V-P-5 and typical cross-sections on Plate V-P-6). Through this reach, the sewer varies in cross-section, reducing in size to a 10.5-foot high horseshoe shape at the northerly Newark boundary; its slopes vary from 0.209 to 0.403 feet per 1000 feet.

The crossing under Second River at the Newark/Belleville boundary consists of two 7-foot diameter siphons. Downstream of the siphon there is a meter chamber enclosing three 36-inch throat diameter Venturi tubes and a meter bypass conduit. Upstream of the siphon, the system includes a sand catching basin.

Through Belleville and Nutley, the intercepting sewer consists of a uniform 10.0-foot high horseshoe shaped cross-section. The slope varies from 0.254 to 0.299 feet per 1000 feet.

At the northerly boundary of Nutley, the sewer crosses under the Third River in two 6.5-foot diameter circular siphons, upstream of which is located a sand catcher and facilities for bypassing into the Third River at the mouth of the Passaic River.

Through the southerly portion of Clifton, the sewer has a 9.0-foot high horseshoe shape, and a constant slope of 0.350 feet per 1000 feet. Immediately upstream of the southerly Passaic boundary, flow passes through the Passaic Venturi meter chamber, which consists of two 36-inch throat diameter Venturi tubes and a meter bypass conduit.

In Passaic, the sewer decreases in size from a 9.0-foot horseshoe section to a 7.5-foot horseshoe section. Slopes vary from 0.299 to 0.432 feet per 1000 feet.

Through the northerly portion of Clifton, the sewer consists of a 6.75-foot circular section and a 6.75-foot high horseshoe section, with slopes of 0.486 and 0.424 feet per 1000 feet. Just above the Paterson boundary, flow passes through the Paterson meter chamber, which includes a single 36-inch throat diameter Venturi tube and a meter bypass pipe.

Through Paterson, the sewer, on the westerly and southerly banks of the river, reduces in dimension from a 6.75-foot horseshoe shape to a 3.75-foot circular shape. Slopes through the Paterson reach vary from 0.419 to 0.738 feet per 1000 feet.

Stationing along the main intercepting sewer (as shown in Table V-T-2 and on Plates V-P-1 through 10) is shown in feet, starting at the Newark Bay Pumping Station and extending to Prospect Street, Paterson. This is a continuous stationing pattern derived from the as-built drawings for each of the 25 original construction contracts. (See Table V-T-3 for stationing references to the original contract drawings.)

Branch Intercepting Sewers (Owned by PVSC)

There are twelve major branch intercepting sewers connecting to the main intercepting sewer, aggregating 74,119 feet in length. All sewers 24 inches in diameter and larger were constructed of monolithic concrete. For sewers below 24 inches in diameter, vitrified clay pipe was used with a concrete encasement.

Following is a brief description of each branch interceptor (see Plates V-P-1 though 4):

Newark (Jabez Street) Branch Sewer. This sewer consists of 3,340 feet of 4-foot 9-inch diameter circular pipe extending in a single line from Station 56 + 59 on the main intercepting sewer.

Kearny/Harrison/Newark Branch Intercepting Sewer. The main portion of this sewer is 5 feet 4 inches in diameter and connects to the main intercepting sewer at Station 89 + 09. It extends north for 15,800 feet, from Newark into Harrison and Kearny, gradually reducing in diameter to a 36-inch pipe. There are nine regulating chambers (three of which are not automatic), one siphon, and two meter chambers on this sewer.

Kearny/East Newark/Harrison Branch Intercepting Sewer. This sewer connects to the Kearny/Harrison/Newark branch intercepting sewer at South Fourth Street in Harrison. The sewer ranges from 36 inches to 15 inches diameter, and the line is approximately 9,000 feet in length. Along the east bank of the Passaic River, there are ten automatic regulating chambers and two meter chambers.

Brown Street Branch Intercepting Sewer. This sewer connects to the Kearny/Harrison/Newark branch sewer on the south side of the Passaic River in Newark. Pipe diameters range from 48 inches to 15 inches, and the line is approximately 7,500 feet in length. There are two automatic regulating chambers along the south bank of the river.

Kearny/North Arlington Branch Intercepting Sewer. This sewer connects to the main intercepting sewer at Station 335 + 99, after a siphon crossing of the Passaic River. The sewer ranges from 24-inch to 12-inch diameter, and is approximately 5,400 feet long. Along the east bank of the Passaic River, there are two automatic regulating chambers. Other appurtenances include two siphon chambers and two meter chambers.

Rutherford/Lyndhurst Branch Intercepting Sewer. This sewer connects to the main intercepting sewer through the Yantacaw Pumping Station at Station 479 + 28. The sewer ranges from 24-inch to 18-inch diameter and is approximately 5,000 feet in length. Appurtenances include the Rutherford Avenue meter chamber, one Passaic River crossing, and three non-automatic regulating chambers. The total flow from this sewer is metered at the Yantacaw Pumping Station.

Garfield/Wallington/Passaic Branch Intercepting Sewer. This sewer connects to the main intercepting sewer through the Wallington Pumping Station at Sta-

tion 621 + 97. The sewer ranges from 54-inch to 12-inch diameter and extends for approximately 13,800 feet. Appurtenances include three siphon crossings of the Passaic River and two meter chambers. The total flow from this sewer and the Rutherford/East Rutherford branch intercepting sewer is metered at the Wallington Pumping Station.

Rutherford/East Rutherford Branch Intercepting Sewer. This sewer connects to the Garfield/Wallington/Passaic branch sewer on the east side of the Passaic River. Diameters range from 36 inches to 24 inches, and the line extends for approximately 5,000 feet along the east side of the river. Appurtenances include two meter chambers.

Lowe Street Branch Intercepting Sewer and Wood Street Lateral. These are small branches, consisting of about 1,100 feet of 12-inch sewer. Appurtenances include one automatic and two non-automatic regulating chambers. Connection to the main intercepting sewer is at Station 1055 + 29 in Paterson.

Warren Street Branch Sewer. This sewer connects to the main intercepting sewer at Station 1073 + 51 in Paterson and consists of about 400 feet of 30-inch diameter pipe, 1,300 feet of 24-inch diameter pipe, and an 18-inch diameter siphon crossing of the Passaic River. Appurtenances include one automatic and two non-automatic regulators.

Lawrence Street Branch Sewer. This sewer connects to the main intercepting sewer at Station 1090 + 75 in Paterson and includes about 3,800 feet of sewer, the major portion of which is 30-inch diameter. Appurtenances include one automatic and six non-automatic regulators, plus a siphon crossing of the Passaic River.

Prospect Street Branch Sewer. This sewer is the most northerly connection to the main intercepting sewer at Station 1119 + 76 in Paterson. It includes about 1,400 feet of 16-inch sewer and an automatic regulator. Two sections of pressure sewer pass under the Passaic River.

For each branch sewer, flows have been estimated or drawn from the meter records and compared with the interceptor capacities at selected locations (see Table V-T-4). As will be noted, capacities seem to be generally adequate for the present, assuming normal line conditions. However, the following branch sewers appear to be inadequate for the ultimate design wet weather peak flows:

(1) Kearny/East Newark/Harrison branch sewer
(2) Kearny/Harrison/Newark branch sewer - downstream of the Kearny - Hamilton Street meter.
(3) Garfield/Wallington/Passaic branch sewer - upstream of the Garfield meter.
(4) Newark (Jabez Street) branch sewer - downstream of the Avenue I connection.
(5) Brown Street branch sewer - upstream of the Freeman Street Regulator.
(6) Warren Street branch sewer - siphon.
(7) Lawrence Street branch sewer -downstream of Lawrence Street Regulator.

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Yantacaw Pumping Station

The existing pumping station was placed in service in 1924. It serves an area west of Route 17 including portions of Lyndhurst and Rutherford.

The normal average flow at this station is 3 million gallons per day (mgd), but recently flows have increased to 5 mgd or greater in wet seasons. The present range of flows is from 2.5 to 5.5 mgd, with the latter condition occurring during periods of rainfall. Present peak flow is approximately 9 mgd and is metered at the station outlet by a Venturi meter.

Incoming flow passes through two sets of bar racks. The first set is manually cleaned and includes a sliding section to facilitate removal of screenings. There is a back-up set of vertical bars (with wider spacing) to prevent passage of debris. Cleanings are manually removed by a motorized hoist set at ground level over the bar racks.

There are three centrifugal pumps in the dry well, each capable of discharging 4,520 gpm (6.5 mgd) against a 28-foot head. Motors are located on the ground floor, each operating at 860 rpm and rated at 50 HP. The motors and pumps are connected by shafts, which are approximately 45 feet long with several intermediate bearings.

Equipment on the ground floor includes a standby diesel generator rated at 125 KV, switch gear, a suction sewer level indicator, and a hand-operated monorail and chain hoist. Spare parts are maintained in the station, including spare impellers for the pumps.

The station is operated by two men per shift on a five-shift basis, plus a station supervisor, for a total of eleven men, so that continuous supervision is provided.

Adjacent to the superstructure there is a tall chimney which was originally intended as the waste outlet from a steam operated unit. At present, it operates as a vent from the dry well.

The capacity of the station appears adequate.

Wallington Pumping Station and Connection (Now in the City of Passaic)

The existing pumping station was completed and put into service in 1924. Recent construction of Route 21 has significantly affected the surrounding pipelines and topography, but has left the basic pumping station untouched, except that the river siphon is now on the suction side of the station instead of the discharge side.

This station serves the municipalities of Wallington, Garfield, East Rutherford, and portions of Passaic, Rutherford and Saddle Brook, and the total flow is metered at the station outlet by a Venturi meter.

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The locally owned Lodi force main connects to the Wallington Pumping Station effluent force main at the station and serves the municipalities of Lodi, Saddle Brook (portion), South Hackensack (portion), and the Wright Aeronautical Corporation in Wood-Ridge. The station discharge connects to the main intercepting sewer at Station 621 + 97.

The overall plan dimensions of the masonry structure are approximately 60 feet in each direction. The station includes a substructure extending about 20 feet below grade, and a superstructure extending about 27 feet above existing grade. Since the installation was originally intended to partially house a steam operated power plant, there is a 70-foot high pile supported chimney adjacent to the structure, and there are large subsurface chambers originally intended for coal storage.

Below grade, there are space allocations for the engine room, storage room and machine shop, heating facilities, a screening area, and an electrical section. In addition, there are above grade level facilities which include an office, a toilet, etc.

Incoming sewage flow passes through manually cleaned bar racks to the horizontal centrifugal pumps operating under a negative suction head, and then is discharged through a header passing through the west wall. The three horizontal pumps are direct coupled to motors. On starting, the pumps are primed with a vacuum pump situated in the northeast corner of the structure. Two of the main pumps have capacities of 10,400 gallons per minute (15 mgd) at a 20-foot head, while the third pump has a capacity of 17,850 gallons per minute (25.5 mgd) at a 19.5-foot head. Motor ratings are 75 HP for the first two pumps and 125 HP for the third. Present flow rates at the pumping station are approximately 9 mgd average and 25 mgd peak, with higher storm peaks presently being experienced.

Incoming service is 4,160-volt, which is transformed in the station to the 220-volt operating service. Motor speeds are controlled electrically in a step pattern, using a multi-step rheostat. A standby generator with automatic transfer switch is available during power outage and for auxiliary power purposes. Motor speeds are manually adjusted to suit incoming flow levels as recorded in the station. The incoming bar racks are cleaned daily, and cleanings are hoisted to the surface for conveyance by truck and disposal to the Newark Bay Treatment Plant.

Other auxiliary facilities include a crane in the engine room for lifting major equipment, a monorail and hoist in the screen room, a flow meter, head and stage recorders, a steam boiler for heating purposes, lockers, and sanitary facilities.

The station is operated by two men per shift on a five-shift basis plus a supervisor, for a total of eleven men, so that supervision is continuously available.

The pumping station is located on a large parcel with riparian rights along the Passaic River. A bulkhead along the river front (newly constructed along the relocated river) permits mooring of vessels used in periodic inspections of the river.

Several alterations and renovations to the original pumping station have been made over the years, including the new diesel engine standby generator and the new electric crane hoist.

No significant growth is expected in the areas presently tributary to the Wallington Pumping Station, and there has been no recent major change in the flows to the pumping station. Therefore, presently installed pumping capacities at the Wallington Pumping Station should be adequate for some time to come, even for short-term peaks which exceed the nominal pumping capacity.

Appurtenances

Meters and Regulators. Descriptions of these appurtenances are included in other chapters and therefore are not elaborated on here. However, data on the condition of the existing regulators and on the need for their repair or replacement is given in sections of this chapter.

Tide Gates. Discharge from regulating chambers or overflows from chambers and weirs are generally passed through an overflow pipe protected by tide gates. Generally, these tide gates are used when river levels rise above the regulators or weir settings. These timber gates are continuously being repaired because of their aging condition. Consequently, and also because they are occasionally blocked by debris, they sometimes permit river inflow at high river levels. In addition, under extremely high river levels, river water enters the system above the tide gates at certain locations. For modification required, see Chapter IX.

Level Recorders. At present interceptor sewage levels are automatically recorded at the Newark Bay Pumping Station, at the Second River yard, and at the Paterson meter. In addition, temporary sewage level gauges were installed in the main interceptor during June and July of 1970 at the following locations in Paterson: East 39th Street (Station 891 + 54), Eighth Avenue (Station 929 + 00), Second Avenue (Station 988 + 10), and Fifth Avenue (Station 1022 + 24). The results of these water level readings were used in checking gradients plotted for this study. Since valuable data was obtained, additional permanent automatic water level recorders are planned at various locations in the system. (See Chapter IX.)

Manholes. At intervals along the intercepting system, brick and concrete manholes have been installed for ventilation and access (see typical detail on Plate VII-P-6). To minimize head losses, the manholes were placed over the sewer, and the sewer cross-section was maintained through the manhole. Following are some of the observations made regarding manhole deficiencies:

(a) There are manholes that have been paved or filled over which require excavation and the raising of their frames and covers to grade.

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(b) Mannole covers have been bolted shut to prevent flooding or their dislocation from the compressed sewer gas atmosphere during surcharging of the interceptor. Covers thus bolted inhibit access, and thus alternatives should be sought. (Ventilating towers may be used to discharge the gases and thus relieve compression surges.)

(c) Additional manholes are desirable at bends in the line, particularly at 90° changes in direction, to facilitate visual observations and cleaning of the line.

Sand Catchers. Concrete pits have been installed as sand catchers in the intercepting system as a protection for downstream devices or to preclude the deposition of debris in the PVSC sewers. These sand catchers are located upstream of meter chambers, river crossings, and regulators, and are cleaned regularly by PVSC personnel.

Present Operating Procedures

Total inflow to the main intercepting sewer is equal to the pumping rate at the Newark Bay Pumping Station plus or minus line storage. The pumping rate can be varied by pumping speeds, and thus the only relative indication of the true amount of flow being received is the changing water level in the sewer. For example, a rising water level indicates that inflow is larger than pumping rates and that sewage is being stored in the line. On the other hand, a falling water level indicates storage depletion.

Normal dry weather operation consists of maintaining the water level in the suction sewer at the Newark Bay Pumping Station between Elevations 85 and 88 by varying the pumping rate as required.

As indicated in Chapters IV and VI, pumping capacity is inadequate during large storms. When a storm is anticipated, the pumping rate is increased in order to lower the water level in the main intercepting sewer and thus provide additional storage capacity. As flow increases (during the storm), the pumping speed is further increased.

If the rise in water level cannot be halted with the pumps operating at maximum capacity to prevent flooding in Newark, it then becomes necessary to manually limit the rate of interception, since the automatic regulators no longer throttle the flow automatically. Operating crews, previously alerted at the beginning of the storm, are dispatched to manually control predesignated regulating chambers in Newark, closing successively as many gates as required and bypassing all local combined flow at these points to the Passaic River.

Regulating gates are usually closed as required at the following locations:

Union Outlet	Herbert Place	Freeman Street
Fourth Avenue	Rector Street	Polk Street
Clay Street	Verona Avenue	Jackson Street.

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Sometimes, in addition, flow from the Newark South Side interceptor is throttled or shut off at its connection to the main intercepting sewer. As the storm abates and the water level starts receding, the previous emergency steps are reversed until normal operation is resumed.

The flow and water level data for the storms of February 3 and April 2, 1970 was recorded and used in the hydraulic studies of the intercepting system. No bypassing to the river (from the intercepting system) was required on April 2, when all four pumps were operating at Newark Bay Pumping Station. At the prevailing high tides, however, it is necessary to direct approximately one-half the flow into Newark Bay, since the inadequate hydraulic capacity of the outfall would result in basin overflows. Normal operating procedure would require three pumps operating and one in reserve, with flow bypassed to the river from the interceptor through the Newark reach, as was the case on February 3, 1970.

Flooding occurs in many communities in low areas during storms. Additionally, if the Passaic River levels are high enough to preclude natural drainage of the low areas, little can be done to relieve these areas of flooding, short of pumping or the installation of flood control works.

Flooding of these areas can occur, moreover, during low river levels if overflows or bypasses to the river are inadequately sized or malfunctioning. It is essential, therefore, that the street catch basins and the sewers leading to the overflows have large enough capacity to carry the water to the river without a large head loss. Without sufficient overflow capacity, the levels in the intercepting sewer and thence in the local sewer would rise high enough to cause local problems.

Almost all of the overflows in the upper end of the intercepting sewer are automatic in the sense that overflow to the river occurs when the gradient of the interceptor reaches a designated level. However, unless there is sufficient capacity in the interceptor, it is impossible to set the overflows at a proper level to protect the river from pollution.

The only point of bypass directly from the main intercepting sewer is at Yantacaw (Third River), 47,491 feet upstream of the Newark Bay Pumping Station. Here it is possible to bypass (if necessary) all incoming intercepted flows from Clifton, Passaic and Paterson, as well as the flow from several other smaller upland communities. Bypassing at Yantacaw Pumping Station, with high river stage, can cause surcharge of the interceptor above Yantacaw. Bypassing is therefore done only as a last resort, as an emergency measure to protect the main pumping station during an exceptionally large storm and/or a breakdown at this station.

As indicated in Chapters VI and XIV, inadequate pumping and outfall capacities are responsible for extremely difficult conditions during wet weather flows. Even with all four pumps in operation (no standby), the pumping capacity of approximately 550 mgd is inadequate, gauged against the required present peak of 633 mgd, when regulated. For example, in 1969, the two diesel-driven pumps were simultaneously down for repairs for a period of several months, reducing the Newark Bay Pumping Station capacity to less than 300 mgd and requiring the excess storm flows

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to be diverted to the river during the emergency period.

It may be seen that timely control of the water levels, although difficult, is necessary to minimize bypassing. Delays in increasing the pumping rate and/or delays in bypassing to the Passaic River may result in localized surcharge of the sewer in Newark, causing backup and premature overflow to the river in Paterson. Water level in the suction sewer has on occasion risen to Elevation 96.50 (almost 8 feet of surcharge on the lowest section of the main interceptor), and the rate of rise may be as high as 8 feet per hour.

As indicated hereinafter, the lower reach of the main interceptor has adequate capacity for dry weather flows for several decades to come, but capacity in the Paterson reach is barely adequate for present dry weather flows, even after cleaning. The interceptor, however, does not have adequate capacity for present wet weather flows (even if regulated).

Since the main interceptor in Newark is much deeper than the Newark sewers, an excessive storm interception can result at this point, unless the flow is manually or otherwise bypassed.

The present maximum hydraulic gradient, shown on Plate V-P-5, is based upon all four pumps operating at Newark Bay Pumping Station and no manual bypassing, for the present wet weather flows indicated in Table V-T-2 and shown on Plates V-P-7 through 10.

Main Intercepting Sewer - Hydraulic Analysis

A complete hydraulic analysis was made of the main interceptor in order to establish its theoretical capacity and deficiencies. For this purpose, data was collected as to conduit size, slope, layout and obstructions, connection details and elevations. In addition, flow and water level records were examined and overflow elevations noted, and in a number of cases the tributary areas of connection where flow is not directly metered were estimated.

Data was also drawn from the studies in Chapter IV in order to establish dry and wet weather flows from all connections and in the interceptor proper. Municipal flows into the main intercepting sewer are presented in Chapter IV, together with a schematic of the existing metering system. The flow through the intercepting sewer is metered by Venturi meters located at Paterson, Passaic, Second River, and the Newark Bay Pumping Station. By differentiation of appropriate meter records, it is then possible (in the majority of cases) to estimate the total municipal flow at each connection. For example, the metered flow from all upstream communities can be subtracted from the flow of one of these line meters, to obtain the unmetered tributary municipal flow. Specifically, flows originating from Paterson can be obtained by subtraction of the upstream metered flows from the Paterson Venturi meter. Flows from Passaic and Newark may be obtained in a similar manner.

Although the total flows of Paterson, Passaic and Newark may thus be obtained, flows at some of the connections are not known and must therefore be estimated. In these cases, tributary areas were therefore determined for each connection (shown on Plates V-P-1, 3 and 4). Based on these tributary areas and on municipal land use, an assessment of the flow from each connection was then made.

Using the data on actual physical installations, in conjunction with actual flows, it was possible to establish a theoretical hydraulic gradient which could then be compared with measured water levels along the actual hydraulic gradient. Any discrepancies between computed and actual conditions disclosed the need for additional data or led to verification that debris is present in the interceptor.

A summary of the findings of the hydraulic analysis is shown in Table V-T-2. The following highlights of the tabulation may aid in its examination:

(a) The first three columns establish the connection location by giving the municipality, street name, and station. (Reference may also be made to the pictorial representation shown on Plate V-P-5.)

(b) The fourth column indicates the horizontal and vertical dimensions of the main interceptor and its configuration. For example, "6.75C" indicates a sewer of circular shape having a 6.75-foot diameter, whereas "6.75H" would indicate a horseshoe-shaped sewer with a width and height of 6.75 feet. (See Plate V-P-6 for typical sections.)

(c) In the fifth column, the physical slope of the interceptor is given in feet per 1000 feet. The slope is averaged over a number of reaches in some cases, and the breaks in slope are indicated by horizontal lines. (It should be noted that the hydraulic gradient does not necessarily match the physical pipe slope as indicated on the profile.)

(d) In the sixth column, information is provided on the assumed roughness factor "n", as used in the Manning formula. In the downstream reaches of the interceptor, the "n" value was assumed at .012 for steady uniform flow in straight sections of pipe. Adjustments were made in the "n" value to allow for losses through section changes, bends, and other minor losses where allowance must be made for momentum changes. Upstream of the Paterson Venturi meter, the overall "n" value was assumed at not less than .013 because the line is smaller and because an extra allowance is required for debris originating from the old Paterson sewers. (See further discussion in Appendix V-A-1 for the basis of "n" values.)

(e) The seventh and eighth columns provide the hydraulic capacity by individual reaches and the averaged capacity over longer sections of the interceptor. The computation of capacity is based on solution of the Chezy-Manning formula, $Q = \frac{1.486}{n} R^{2/3} S^{1/2}$

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wherein "Q" is the flow in cubic feet per second, "n" is a dimensionless roughness coefficient, "R" is the hydraulic radius in feet (cross-sectional area divided by wetted perimeter), and "S" is the slope of the energy gradient. (See further discussion in Appendix V-A-1.)

(f) The ninth, tenth and eleventh columns provide information on present flows as derived from metered data. Information is given for each branch connection as to the average daily flow, peak dry weather flow, and peak wet weather flow. (For further information, see Chapter IV.)

(g) The twelfth, thirteenth and fourteenth columns provide information on estimated future flows at each connection. Again, these are shown as average daily flow, peak dry weather flow, and peak wet weather flow.

(h) The fifteenth and last column indicates the estimated deficiency of the main intercepting sewer, which is the difference between the sewer capacity and the future peak wet weather flow.

As indicated in Table V-T-2, the main intercepting sewer is inadequate for present wet weather flows. Based on design parameters, provisionally approved by NJSDEP, the present wet weather peak rate should be 633 mgd, but since this quantity cannot be handled by Newark Bay Pumping Station because of the present pumping limitations, bypassing is required.

The conclusions drawn from the hydraulic analysis of the main intercepting sewer are as follows:

--Above Clifton Avenue in Clifton, the existing interceptor is barely adequate for present dry weather peak flows.

--With debris in the line, the existing interceptor above Clifton Avenue is inadequate even for present dry weather peak flows, and daily overflows have been noted.

--Below Clifton Avenue in Clifton, the existing interceptor has sufficient capacity to handle dry weather peak flows for the next several decades.

--No portion of the existing interceptor has sufficient capacity for wet weather peak flows, even if uniformly regulated.

Deficiencies and Problems in the Intercepting System

Flows and Capacity. The principal and most obvious difficulty with the existing intercepting system is its inadequacy to handle current rates of flow. Observations during the spring of 1972 indicate that PVSC sewers are surcharged under normal weekday conditions during the wet season--even after three to five days without rain. Actually, this condition was aggravated by an exceptionally wet spring, but even in prior years levels have been excessive in the system (ref. Plate V-P-11). Inspection of the main intercepting sewer is possible only during the first two weeks in July (if there is no precipitation), when there is a shutdown period for much of the area's industry.

An indication of the magnitude of this problem may be obtained by reference to the hydraulic gradients along the main intercepting sewer (see Plate V-P-5). Using 1970 flow data and actual experience as reflected at seven water level gauging stations, the evidence of surcharging is clear (see Plate V-P-11). During 1970 dry weather conditions, the maximum flows occupied about 80 percent of the sewer height through Newark, Belleville, Nutley, Clifton, and Passaic. Above Passaic, the dry weather maximum gradient was at the crown of the sewer through Clifton and the lower portion of Paterson. Through the upper portions of Paterson, particularly where debris has been reported, the gradient is considerably above the top of pipe, surcharging to about 8 feet over the pipe crown in some locations.

The hydraulic gradient for maximum wet weather flow shows a more severe condition. The sewer is surcharged for its entire length with maximum surcharges in the order of 10 feet. The surcharge is not as critical in Newark, where the interceptor is deep and the local sewers are above the surcharging levels; however, through large sections of Belleville, Nutley, Clifton, Passaic, and Paterson, the surcharging is sometimes above ground level (resulting in overflows to the river).

Regulator Failures. Under the original concept, the system's regulators were intended to bypass storm flows to the river automatically. As described elsewhere, these regulators operated through a system of stilling wells and floats which would close the gates controlling inflow to the intercepting sewer as levels rose during storm periods.

It has proven impractical, however, to maintain the regulating system in view of the following factors:

(a) Deterioration from approximately fifty years of usage, which has resulted in clogging and corrosion of moving parts under the influence of waste atmospheres.

(b) The difficulty of removing sludge and other deposits from stilling wells.

(c) Clogging of telltale openings.

(d) Debris in gate openings prevents proper closing.

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(e) The burdensome task of maintaining facilities in subsurface atmospheres which are irritating under the best conditions and toxic under the worst conditions.

Thus, regulators have become inoperative throughout the system despite a considerable effort by operating personnel. As an example, new fittings and working arms were installed at a major connection point in the Clay Street regulating chamber in Newark. Working parts were refurbished where possible at a considerable expense in time and materials. Yet the system could not be made operable because of its aged condition. At present, this regulator is operated manually by a chain-hoist attached to the gate, requiring a burdensome operation during storm conditions.

As a result of the regulator failures in the Newark area, a considerable amount of storm water is admitted to the system, causing major surcharging, which necessitated an operating procedure of manually operated bypassing at predetermined points (see description of operating procedures).

River Inflow. There are times when the system has been surcharged by the inflow of river water under high tide conditions in the lower areas or high river levels above Dundee Dam. As evidence of this problem, there have been recorded instances where flows increased in relation to the tides, where fish have been caught on the screens at the Newark Bay Pumping Station, and where chloride concentrations have increased during extreme tides.

On these occasions, operating personnel have found broken tide gates, gates held open by debris, and broken overflow weirs, making necessary a constant surveillance over the double tide gates at each point of overflow. However, observations of necessity are intermittent, and tide gates have been known to remain open for a period of time when debris was caught in the frames. Further, there are openings above the tide gates which could admit river water under extremely high tides.

Observations have been hindered by a lack of tidal information; thus the installation of recording tide gauges at intervals along the river is necessary.

Depositions and Obstructions. The system has been plagued by the accumulation of debris, silt and other material in the invert of major intercepting sewers. In addition, obstructions (such as pipelines) have been found within the hydraulic waterway of the main sewers. As a result, the system's hydraulic capacity has been significantly impaired.

This problem is most acute in the Paterson area, where inspections have revealed a considerable accumulation of material in the main intercepting sewer. It is presumed that these depositions are caused by the following factors:

(a) Failure of aged local sewers in the Paterson system, resulting in the discharge of brick, rubble and other materials.

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(b) Deposits of sand and silt during low velocities under dry weather conditions. (See Appendix V-A-2.)

(c) Discharges from industrial or commercial sources.

In Passaic, a 36-inch drain and four pipes of 6, 8, 12 and 14-inch diameter were recently found crossing through the upper portion of the 9-foot main intercepting sewer. These obstructions create a small hydraulic loss, and the two smaller pipes were removed by PVSC forces. The removal of the remaining pipes is desirable but would require a major undertaking.

In two places in a branch sewer, weir chambers were originally installed as metering devices without providing an appropriate invert drop. As a result, material accumulated behind the weir, requiring periodic cleaning. For example, during May 1972, a considerable expenditure of time was required for cleaning of the Kearny/East Newark/Harrison branch because of accumulations in the line. If there is insufficient drop available for the proper installation of a weir chamber, consideration should be given to a replacement of the chambers with Venturi installations.

In anticipation of a major cleaning program in the Paterson area, the Commissioners have enlarged manhole openings from 24 inches to 30 inches in diameter at the street level. In addition, a 48-inch access manhole has been made part of the recent Route 21 construction. However, difficulties are anticipated in cleaning the main intercepting sewer through 90° bends, where access is limited. Additional access manholes or shafts may therefore be necessary for a proper cleaning operation.

At present, PVSC has two sand catcher cleaners and one bucket type sewer cleaning rig. In view of the importance of more frequent cleaning, it may be desirable to augment this equipment and to add the necessary crews for a more frequent removal operation.

Consideration should also be given to the use of sand catchers at points of entrance from the Paterson and East Rutherford systems, where experience has indicated that debris may be discharged upon the failure of local sewers.

Metering Problems. The PVSC metering system is carefully maintained, and the recording charts are painstakingly planimetered, in an effort to obtain accurate tributary flows which are the basis of charges. However, the following difficulties have been noted:

(a) Central metering is desirable, so that the cause of a sudden inflow from local sewers may be determined promptly; otherwise, such difficulties are not evaluated until the seven-day charts are collected.

(b) Integration of the flow records by computer would give greater accuracy, and would be less labor-consuming than the present operations, which require planimetering of each chart.

(c) Where meter pedestals are exposed to traffic hazards, concrete bumper posts would be desirable.

(d) Because of equipment limitation and/or weir submergence due to surcharging, recorded peak flows during wet weather conditions are inaccurate at several locations.

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Industrial Waste Problems. Numerous difficulties have been reported as a result of discharge from industries having deleterious wastes. The results are as follows:

(1) Deterioration of downstream facilities including sewers, manholes, meter chambers, etc. Usually this has occurred in the local municipally-owned chambers and meters.

(2) Release of fumes into the intercepting system with resultant irritating and possibly toxic effects on personnel; also, the release of corrosive fumes which have deteriorated upper manhole rungs and appurtenances

(3) The period discharge of materials, such as oils, heavy metals, etc., which affect the normal treatment methods.

Structural Problems. Period inspections have indicated that there are structural failures at several locations along the main intercepting sewer and branch intercepting sewers. Although such inspections have been limited by the high flows in the system, certain specific instances have been reported:

(a) A crown crack in the main intercepting sewer north of Route 3 is reported to be 3/8-inch to 1/2-inch wide and extending for 500 feet. (This portion of the sewer was subsequently protected during the construction of the Route 21 Freeway.)

(b) A longitudinal crack in the invert of the main intercepting sewer in Nutley, extending for about 100 feet.

(c) A crown crack in the 48-inch Harrison/Kearny branch intercepting sewer.

(d) Major cracks in the tunnel portion of the main intercepting sewer in McCarter Highway, which were recently repaired by use of an internal concrete lining.

These reported problems, which are based on partial and intermittent inspections, indicate the need for a comprehensive survey of the system. It is expected that an overall survey would be feasible only during off-peak dry weather periods (in view of the recent heavy flows and surcharge conditions) and may possibly have to wait until hydraulic relief is obtained from a relief interceptor. In the branch intercepting sewers, internal television inspection would be advantageous for the small diameter sewers, and flows may have to be blocked, during the survey, through the use of air bags or similar line plugs.

Storm Water Overflows. Difficulties have been encountered with locally owned overflow pipelines between the regulator chambers and the river outlets. Many of these overflows have been filled, some have been lost, and others are supected of being broken or clogged. As a result of these conditions, it is believed that excessive storm flows are entering the PVSC system.

Examples of these problems have been noted in the Paterson area, where fill has been placed over the overflow lines and their location is presently unknown. Similarly, along the Rutherford/Lyndhurst branch sewers, overflows to the river along Riverside Avenue have been covered by house construction and filled land.

It would therefore appear necessary for a survey to be made of all known overflows and for PVSC to acquire and maintain these facilities where necessary.

Illicit Connections. Major problems have been reported in areas of Harrison and Kearny, where streets are flooded during storm periods. It is believed that this problem is aggravated by connections from storm water sewers into the PVSC system, without overflows. Since the system is not designed for full acceptance of storm flows, the inevitable result is a surcharging of the sewer and a flooding of streets.

Administrative authority must be obtained by the Commissioners so that an order may be issued, requiring that storm water connections be removed unless properly protected by overflows. In addition, a survey of such conditions is essential.

Summary

Following are the principal conclusions reached in the analysis of the existing intercepting system:

(1) Supplementary capacity is required in the main intercepting sewer, since the existing interceptor is barely adequate for present dry weather peak flows in its upper reach, and is inadequate for wet weather peak flows in its entire length, even if uniformly regulated. Additional capacity is required.

(2) Capacities are inadequate along several of the branch intercepting sewers, when considered against ultimate wet weather peak flows. Additional capacity must be provided.

(3) Minor improvements are desirable at the Yantacaw and Wallington Pumping Stations and should be carried out.

(4) A more efficient system of regulating the sewer level and overflows to the river should be developed to limit interception of flows to the values established in Chapter IV, and for automatic or computer control at the Newark Bay Treatment Plant facilities.

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(5) Since intercepting system levels are controlled by pumping capacity at the Newark Bay Pumping Station, additional pumping capacity is clearly necessary to permit control of the sewer levels.

(6) In view of the failure of the regulator system, alternative solutions must be sought for bypassing storm flows, as for example, water-level-controlled, motorized sluice gates.

(7) Additional surveys are required for possible sources of river inflow during high river flows, in view of accumulating evidence that this condition exists. Tide gates should be replaced with new metal gates and a tide gate chamber should be modified to prevent river inflow to the interceptor.

(8) Debris and obstructions must be cleared from the intercepting system and should be preceded by a survey. PVSC has authorized investigation, study and report, and the preparation of contract documents for the clearing of debris and the removal of obstructions in the interceptor through the Paterson reach.

(9) Additional manholes should be installed to facilitate inspections and cleaning.

(10) Although structural failures are minimal, a survey of the system is necessary in view of reported pipe damages. Portions of the main interceptor have already been surveyed.

(11) Additional metering stations and additional level meters should be installed.

(12) Consideration should be given to acquisition of overflow facilities, after a survey of their location and the problems involved is made.

(13) Detailed examination should be made of the problems in Harrison and Kearny, where storm sewers have been connected without overflows.

APPENDIX V-A-1

HYDRAULIC THEORY FOR INTERCEPTING SEWER ANALYSIS

Two modes of flow convey water and sewage: the open channel mode and the pressure mode. The open channel mode is characterized by a free water surface subjected to atmospheric pressure in a conduit, in contrast to the pressure mode, which always flows full and under hydraulic pressure (in addition to atmospheric pressure) in a conduit.

Most sewers are designed for the open flow mode, although they may occasionally flow full. Discharge conduits from pumping ststions (or force mains) and inverted siphons are the exceptions. The capacity of storm or combined sewers is sometimes exceeded in heavy storms, in which case water rises in the manholes and inlets may be full and overflowing. The sewer is then under pressure and said to be surcharged. Surcharge conditions may also occur in sanitary sewers because of a submerged outlet condition, line obstruction, and excessive wet weather infiltration or when its design capacity is exceeded.

Steady uniform flow defines two conditions of flow. Steady flow is said to occur at a point when the velocity at that point does not change with time. Uniform flow refers to the condition where velocity does not change with distance. Constant velocity also implies constant depth, slope and cross-section. In steady uniform flow, the energy gradient is parallel to the hydraulic gradient (or liquid surface in open channel flow) and a velocity head, or $V^2/2g$, above it; the velocity head is a measure of the kinetic energy of the moving fluid. (This is not true for steady non-uniform flow.) If water enters a conduit at a constant rate and discharges freely at the downstream end, steady uniform flow will soon be established. In sewer design, steady flow can usually be assumed. Uniform flow may be expected in a straight sewer line, but velocity changes, which must all be taken into account, will occur at points of connections or changes in section size, at obstructions and at bends.

Principles of mechanics govern the flow of fluids. Thus, water moves downstream because of the force of gravity. The acceleration which should be expected because of the force of gravity does not materialize (instead, the water acquires a constant velocity), since friction of the water against the conduit walls is the equilibrant opposing gravity. A small part of the available head is used to impart the original velocity to the fluid: that is, to attain kinetic energy or velocity head.

The amount of frictional resistance that must be overcome will vary directly with the roughness of the conduit surface and the area of conduit (liquid contact surface), approximately as the square of the velocity, and directly with the density of the liquid. These relationships can be mathematically expressed by formulae.

The most commonly used formula for determining the velocity of flow of water in open and pressure conduits under steady uniform flow conditions is the Chezy formula:

$$V = C R^{\frac{1}{2}} S^{\frac{1}{2}}, \text{ wherein}$$

C = coefficient
V = velocity in feet per second (fps)

R = hydraulic radius (feet) = $\frac{\text{stream area, A (square feet)}}{\text{wetted perimeter, P (feet)}}$

S = slope of the energy gradient = $\frac{\text{frictional head loss, hf (feet)}}{\text{length, L (feet)}}$

Where steady non-uniform flow exists in an open channel, the Chezy formula can be used for small stretches, assuming "V" to be the mean velocity within each stretch. Actual conditions can thus be approximated very closely.

Although essentially empirical in form, the Chezy formula is universally known to engineers, and all subsequent experiments have been applied or related to it. The coefficient "C" can be obtained by using one of the following expressions:

1. $C = \left(\frac{8g}{f}\right)^{\frac{1}{2}}$ (Darcy-Weisbach)

2. $C = \dfrac{41.65 + \frac{.00281}{S} + \frac{1.811}{n}}{1 + \frac{n}{R^{\frac{1}{2}}}\left(41.65 + \frac{.00281}{S}\right)}$ (Kutter)

3. $C = \frac{1.486}{n} R^{1/6}$ (Manning)

4. $C = \dfrac{157.6}{1 + \frac{m}{R^{\frac{1}{2}}}}$ (Bazin)

In these expressions, "f, n and m" indicate roughness factors for water in specific conduits, and "g" is the gravitational acceleration equal to 32.2 fps^2.

Kutter's formula was devised to compute the "c" coefficient in the Chezy formula. This coefficient is a constant approximation (not a true constant) and varies with the hydraulic slope "S", the hydraulic radius "R", and the assumed or experimental roughness factor "n". "C" increases with "R" and "S" even for a constant "n". This is true only because the exponents used for these terms in the formula are below their true values. Exponents can be selected, however, based on average conditions of low, size, surface and slope, so that the value of "C" is practically constant for a given approximate condition.

Manning's "n" is substantially equal to Kutter's "n" for most commonly used sewers. The Chezy-Manning formula, because of its greater simplicity, is generally preferred for open channel flow and is used herein. All of these formulae are equally applicable to pressure conduits, just as the Hazen-Williams* formula (preferred for pressure conduits) is applicable to open channel flow. The latter formula is one of the subsequently developed, so-called exponential formulae.

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* Hazen Williams formula: $V = 1.318\ C\ R^{0.63}\ S^{0.54}$. C = Chezy coefficient at S = .001.

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The PVSC main interceptor is a large conduit varying in size from 3.75 feet to 12.50 feet. It should be noted that the larger the conduit, the smaller the friction coefficient, all other things being equal. Additionally, changes in direction in small sewers are made through sharp bends or, more commonly, through manholes which have larger cross-sections than the conduits, thereby causing both expansion and contraction losses. Although the bottom of the manholes is often troughed and curved to reduce the loss, this is most effective when the sewer is flowing only partly full. In contrast, however, bends in the main interceptor are smooth curves of long radii, and manholes have a cross-section equal to the adjacent conduit. The several inspections have also revealed that the main interceptor is generally in good condition and is relatively clean, with a greasy coating (except for certain areas where obstructions were discovered, which is discussed elsewhere). Based on the above, the main interceptor's coefficient of friction should be relatively low, expecially since there are in effect few joints.

The percentage error resulting from an assumed roughness factor "n" in the Kutter formula can be approximated. If, for example, "n" is assumed to be .013 when its actual value is .015, the actual capacity would be about 86.6 percent of the estimated capacity, an error of approximately 15.4 percent.

Erroneous assumptions as to the roughness factor can result in appreciable error in estimating capacities, and errors of 5 to 10 percent are highly probable due to the difficulties in estimating this factor because of the numerous parameters involved, especially in conduits where bottom debris is possibly due to obstructions in a line and low velocities.

Tests have never been conducted to determine the roughness factor(s) of the main interceptor because of the difficulties involved. This factor must then be estimated on the basis of other comparable test data, and on design practice, and the results therefrom compared to available data on the main interceptor.

Theodore Horton (1901), in a comprehensive article entitled "Flow in the Sewers of the North Metropolitan Sewerage System of Massachusetts" (Trans. ASCE, December 1901, page 78), conducted three series of tests in the period from July 1896 to April 1900 on two large sewers to determine the respective roughness factor "n" and its variation with age. Of interest is the fact that the greatest change in the roughness factor occurred soon after the channels were put into operation, with little change after three to five years. The investigated trunk sewers were the 9-foot circular conduit in the East Boston channel and the 6-foot by 6.67-foot basket-handle shaped conduit in the Charleston channel, both of cement-washed brick construction, flowing partly full.

Although most hydraulic-element graphs have been prepared on the assumption that the roughness coefficient "n" does not change with the depth of flow, it has long been known that this assumption is erroneous, as shown by the experiments of Yarnell and Woodward and of C. F. Johnson. The "n" values experimentally determined by Horton and the estimated corresponding values for the flowing full condition are shown below for comparison:

Mean Kutter's Roughness Factor "n"

Test Series Data	Charleston Channel (6.00' x 6.67' Basket Handle Section)		East Boston Channel (9' Circular Section)	
Flowing Condition:	Partly Full* (Horton Tests)	Full (Estimated)	Partly Full* (Horton Tests)	Full (Estimated)
1895 (Initial Operation)	.011	-	.010+	-
1896	.0132	.0103	.0116	.0092
1897	.0148	.0119	.0127	.0100
1900	.0152	.0122±	.0133	.0105±

*Note: Approximately 20 to 50 percent full.

Test data for the fairly clean and smooth 9.0-foot wide by 7.7-foot deep brick Sudbury aqueduct were reported by Fteley and Stearns (Trans. ASCE, 1883, page 114). The conduit has a horseshoe section of 4.5-foot radius with an 8.3-foot wide by 0.7-foot deep invert, and is lined with hard brick having cement joints $\frac{1}{4}$-inch thick. With depth of flows ranging from 1.8 to 5.0 feet, Manning's roughness factor "n" varied between .0114 to .0124 for the 48 tests conducted. The conduit was then carefully cleaned, and during the following 13 tests, the "n" factor never exceeded .0118 with water depths of 0.72 to 1.42 feet. During all those tests, flowing velocities were between 0.49 and 4.4 feet per second.

The following data is extracted from the digest of experimental data presented by Metcalf and Eddy in "American Sewerage Practice," Vol. I, "Design of Sewers," First Edition, pp. 83 to 90.):

"Freeman C. Coffin (1906) reported the coefficient of roughness which he found in the Cambridge, Mass., conduit--built under his direction in 1906, of Portland cement concrete, the surface of which had been subsequently brushed with neat cement--as being approximately n = 0.011 under the observed conditions of flow. These were, depth 1.75 ft. in circular conduit 63. in. in internal diameter, laid upon a slope of 3 in. per thousand feet.

"J. B. Lippincott (Eng. News, June 6, 1907) summed up the results of his experiments in canals in South California thus:

'It would appear from these experiments that a coefficient of 0.012, for n in Kutter's formula, would be safe in tunnels or covered concrete conduits with plastered surfaces.'

"The Bureau of Surveys of Philadelphia, Pa. (1909) had a series of observations made, of the values of the coefficient of roughness, n, of certain of the large sewers in that city, with the following results:

	n
Old sewers, brick bottom not clean	0.017
Old sewers, stone block bottom clean	0.017
New sewers, stone block bottom clean	0.016
New sewers, brick bottom clean	0.015
Concrete or brick sewer, vitrified shale brick invert, clean	0.012 to 0.013
Concrete sewers, granolithic finished bottom . . .	0.011
Open channel box, planed planks.	0.011
Old sewers, bad or dirty bottoms	0.017 to 0.020

"James A. Cushman (1911) in an interesting article upon "Coefficients of Flow in the Wachusett Aqueduct," of the Metropolitan Water Works of Boston, Mass. (Eng. News, Aug. 29, 1912) gives a summary of the gagings made there. The conduit is 10.5 ft. high x 11.5 ft. wide, horseshoe in shape, lined with brick upon its invert with and for a distance of 5.4 ft. above it, the remainder of the section and roof being built of Portland cement concrete. The investigation shows that Kutter's n decreased as the water level rose above the top of the brick lining:

For the brick-lined surface n = .0123
For both surfaces together n = .01135.

"It is estimated that n would be .0112 or lower at the point of maximum flow, had the conduit been built entirely of concrete of the same workmanship as the top portion.

"H. D. Newell (Eng. News, May 1, 1913, p. 904) reports experiments upon 16-, 30- and 46-in. reinforced concrete pipes built by the United States Reclamation Service. These results may be summarized as shown in the table below:

Frictional Loss in 16-, 30-, and 46-In. Concrete Pipes
(H. D. Newell)

Diameter (in.)	Length (feet)	Flow (cfs)	Velocity (fps)	Total Friction Head (feet)	S per 1000	Chezy Formula (c)	Kutter's Formula (n)	Hazen & Williams Formula(c)
46	9,800	46.15	4.00	8.53	0.87	138	0.011	140
-	-	45.90	3.08	7.68	0.78	145	0.0106	148
-	-	48.16	4.17	10.61	1.08	130	0.0117	130
-	-	48.59	4.21	10.03	1.02	135	0.0113	135
30	5,130	17.70	3.61	5.48	1.07	140	0.0103	148
-	-	(16.62-17.04)	3.43	5.40	1.05	132-135	0.0108 0.0106	142
-	3,658	13.38	2.73	3.13	0.86	118	0.0119	126
16	700	3.74	2.68	2.67	3.8	75	0.0154	82
-	-	4.87	3.40	3.16	4.5	90	0.0134	98
16	909	3.42	2.45	1.71	1.88	98	0.0125	100

After carefully reviewing the above test results and evaluating all the parameters involved for the main intercepting sewer, the following conclusions were drawn:

(1) The hydraulic gradient computations should be based on frictional losses at $n = 0.012$ for steady uniform flow in straight conduit sections, plus an allowance for additional losses due to bends, section changes and inflows. The roughness factors shown in Table VII-T-2 are "overall" equivalent factors for the indicated sections which include all of the above losses.

(2) Computed losses for the present maximum wet weather hydraulic gradient (see Plate VII-P-5) for the 30,280 feet of sewer between Second River and Newark Bay compare very well with the actual losses during the storm of April 2, 1970 after adjustment for flow differentials. Losses between Second River and Paterson could not be checked because the Paterson water level gauge cannot record the high wet weather water levels. However, evaluation of the system conditions such as elevation of top float wells at metering stations and of tops of bulkheads at meter bypasses and the Third River bypass permitted an indirect and approximate check. No checking was possible above the Paterson meter; however, based on physical inspections and the available present dry weather peak gradient, the mean roughness factor was estimated at approximately 0.020.

(3) The excessive amount of debris in the Paterson stretch of the main intercepting sewer must be removed to restore the conduit's capacity. Nevertheless, allowance must be made for future debris accumulations in that stretch because of the conditions and characteristics of the old local collecting sewers in Paterson. Thus it was decided to use an "overall" roughness factor of not less than 0.013 for the capacity and gradient computations upstream of the Paterson meter, a value further justified by the fact that the sewer is smaller (down to 45" ø diameter) in that area.

TABLE V-T-1

PASSAIC VALLEY SEWERAGE COMMISSIONERS
PRESENT TOTAL CONTRACTED CAPACITY

		Present Allocated Contracted Capacity (in million gallons per day - mgd)	Leased
Bergen County			
East Paterson Borough			1.50
Fair Lawn Borough			2.50
Glen Rock Borough			1.50
Lodi Borough		2.00	2.50
Saddle Brook Township			2.00
Fair Lawn Industries			0.60
Marcal Paper Mills, Inc.			1.00
East Rutherford Borough		2.33	
Garfield City		6.11	10.00
Lyndhurst Township		3.51	
North Arlington Borough		1.59	
Rutherford Borough		2.76	
Wallington Borough		2.75	
	Subtotal	21.05	21.60
Essex County			
Belleville Town		10.03	
Bloomfield Town		11.60	
Glen Ridge Town		3.15	
Montclair City		10.01	
Newark City*		132.17	
Nutley Town		9.02	
Orange City		9.89	
	Subtotal	185.87	
Hudson County			
East Newark Borough		1.03	
Harrison Town		7.07	
Kearny Town		10.92	
	Subtotal	19.02	
Passaic County			
Clifton City		14.71	
Haledon Borough		1.66	
Hawthorne Borough			3.00
Little Falls Township			0.04
Passaic City		24.73	
Paterson City		56.17	
Prospect Park Borough		1.52	
	Subtotal	98.79	3.04
TOTAL		324.73	24.64

* Newark City subleases 6.59 mgd of its allocated capacity to East Orange City.

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APPENDIX V-A-2

CONDITION OF MAIN INTERCEPTING SEWER THROUGH CITY OF PATERSON REACH 1970 INSPECTION

REPORT ON PATERSON SEWER SURVEY MADE JULY 18, 1970.

The following is a record of observations made within selected manholes along the length of the Commissioners' Paterson Interceptor. The survey was conducted at low flow hours during the annual July industrial plant vacation period. It constituted an effort to take advantage of this period to gain access to the interior of our main interceptor through its entire length.

As meager as the information obtainable was, when standing at the bottom of a manhole, it was to the knowledge of the writer, the first time in at least twenty years that any observations had been made on some sections of the sewer's interior. With this in mind, the survey was concentrated on the smaller sized sewer sections.

A long section of the 6'-0" sewer was observed at the time of the Marcalus connection in 1960 and the majority of the 6'-9" sewer was studied and photographed in 1963 as part of the Route 80, construction.

The survey was conducted by the Paterson crew, with J. Kearney, Assistant Superintendent of Line, entering the sewer.

Section 16, 6'-9" Sewer - (Below Garden State Parkway, In Clifton)

Manhole Station 31 + 57, (5:30 A.M.)
Depth of flow about 50" ± with about 8" of muck present underfoot. Sewage flowing bright green. Condition of line was good with nothing unusual noted. Heavy fumes present.

Section 17 So., 5'-9" Sewer- (Below Broadway Overpass).

Manhole Station 54 + 50, (6:00 A.M.).
Found invert clear of muck but some stones or rubble present, (this manhole had been rebuilt in 1954, as part of a highway bridge construction project). Man could not stay down due to intense fumes and observations were limited.

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Section 17 Cent., 5'-9" Sewer. (Below 10th Avenue Circle)
Manhole Station 22 + 29, (6:20 A.M.).

Started use of forced ventilation for the remainder of observations. Depth of flow about 46" ± with about 6" of muck present under foot. Condition of line good with nothing unusual noted.

Section 18 So., 5' - 8" Sewer. (Below Hawthorne Connection)
Manhole Station 16 + 17, (6:45 A.M.).

Sewer is circular in this section, (confirming record drawings). Manhole is of special shaft type construction with a shelf or bench present. Depth of flow about 50"± with heavy muck present measuring 15" to 18" deep. Sewage still flowing bright green.

Section 18 Cent., 5' - 5" Sewer. (At 6th Avenue Connection)
Manhole Station 23 + 0, (7:15 A.M.)

Depth of flow about 44" ± with a measured depth of muck of 14" underfoot with no stones noted. Interior of sewer is coated with grease and no concrete deterioration observed. Checked 12" connecting pipe from 6th Avenue, branch which was just about half visible above the flow. Green color gone from sewage.

Section 18 Cent., 5' - 5" Sewer. (At Lowe Street Connection)
Manhole Station 33 + 0, (7:40 A.M.)

Depth of flow about 42" ± with a measured depth of muck of 14" underfoot and no stones present. Noted an off-set curve present upstream (very close) with what appeared to be about a 6" protrusion on the near side-wall (side with M.H. steps). No concrete deterioration observed. 12" Lowe Street connection underwater.

Section 18, No., 5'- 5" to 4'-9" Sewer. (At Warren Street Connection).
Manhole Station 1 + 60, (8:00 A.M.)

Depth of flow about 36"± with about 12" of muck and stones present underfoot. Picked up and removed a granite paving block at the manhole location. Walked about 10 foot downstream and examined the 30" connection and no deterioration.

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Section 18 No., 4'-9" Sewer. (At Straight Street Connection).
Manhole Station 10 + 25, (8:20 A.M.).

Manhole is of special construction as shown on Drawing L2226. The long platform was loaded with organic deposits and floating materials (bottles, cans, etc.) with the walls thick with grease deposits up to a high water line approximately 4 ft. above platform. Depth of flow was about 33" with 15" of stones, sand and grit along walls decreasing to about 12" deep in middle. Condition of pipe was good, with a fine grease coating. Noted the 24" connection opening as completely visible.

Section 18 No., 4'-9" Sewer. (At Montgomery Street Connection).
Manhole Station 15 + 07, (8:45 A.M.)

Depth of flow noted as dropping through manhole due to change in amount of deposits present with about 12" of sand and stones below manhole increasing to about 15" above. The increase in depth of deposits through manhole very obvious. Condition of concrete was good. The level of flow was about 6" below the 36" connection invent. (This is not in agreement with record drawing elevations).

Section 18 No., 3'-9" Sewer. (At Bridge Street)
Manhole Station 26 + 30, (9:20 A.M.)

Depth of flow about 28" ±, with 8" to 10" of grit underfoot, few stones present. Noted brick masonry sewer construction upstream, with possibility of missing bricks observed about 20 ft. above. The sewer appeared out of round and the sidewalls appeared to have an offset about 40' to 50' upstream, with offset observed on south side wall. Condition prevented observing north sidewall. Little grease present on sewer walls or at the manhole.

General conclusions which can be drawn from the survey are;

1. The sewer appears to be in better structural condition than was anticipated, considering the corrosive nature of Paterson industrial wastes. This statement is based on our innumerable observations of deterioration to the local Paterson sewers, our branch sewers at the points of connection and also within our connection chambers.

2. Hydraulically the line appears to be in reasonably good condition in the larger diameters (except for the Market Street area), with silting increasing as the diameter decreases. The increases are probably due to the increased surcharging which occurs in the upper sections, resulting in periods of reduced flow velocities. This is especially evident at the Montgomery Street connection where a large volume of flow entering the line at this point has caused an increase in the amount of deposited grit, etc., above the connection.

3. The condition observed at Bridge Street warrants closer investigation.

Respectfully submitted:

E. J. Moller,
Deputy Engineer

8/4/70

EM:mr

TABLE V-T-4

BRANCH INTERCEPTING SEWERS - CAPACITY vs. FLOW

(Selected Locations)

Branch Intercepting Sewer	Sewer Size and Slope	Sewer Capacity (1) (mgd)	Wet Weather Peak Flows: Present (2) (mgd)	Wet Weather Peak Flows: Future (3) (mgd)	Annual Average Flows: Present (2) (mgd)	Annual Average Flows: Future (3) (mgd)
			> = Over			
Newark (Jabez Street)						
Downstream of South St. Connection	57"@0.00273	76.4	(33.2)	38.5	13.55	15.92
Downstream of Avenue I Connection	57"@0.0010	46.4	>55 (43.0)	54.9	18.37	22.07
Kearny/Harrison/Newark						
Kearny -Hamilton St. Meter - Influent Sewer	42"@0.00065	16.6	> 6.8 (10.7)	14.2	3.29	4.55
South 4th St. Meter - Infl. S.	56"@0.00039	27.8	23.0 (40.5)	52.5	12.12	16.17
48-inch Siphon	-	25.2	23.0 (40.5)	52.5	12.12	16.17
Downstream of Jackson Street Regulator	64"@0.00038	38.8	>25.6 (44.3)	57.1	13.43	17.71
Downstream of Brown St. Branch Influent Sewer	64"@0.00038	38.8	>50 (59)	76	18.25	23.66
Kearny/East Newark/Harrison						
Kearny - Johnston Ave. Meter - Influent Sewer	33"@0.00075	9.4	>5.6 (8.5)	11.3	2.59	3.59
East Newark Meter Infl. S.	36"@0.00060	10.6	>7.0 (11.0)	14.3	3.15	4.30
Brown Street						
Downstream of Brown St. Connection	24"@0.0014	4.8	>6.3 (6.9)	9.3	2.03	2.79
Downstream of Freeman Street Regulator	48"@0.0010	29.5	>15.9 (11.3)	14.2	3.51	4.41
Downstream of Polk Street Regulator	48"@0.0010	29.5	>21.4 (15.1)	18.8	4.82	5.95
Kearny/North Arlington						
Kearny-Belleville Pike Meter - Influent Sewer	18"@0.0014	2.20	(0.4)	0.6	0.10	0.13
North Arlington Meter - Influent Sewer	24"@0.0011	4.20	(2.7)	3.4	1.00	1.27

(1) Capacities are based on n = 0.013 for sewers larger than 24 inches and on n = 0.015 for smaller sewers and all siphons, assuming sewers flowing full.

(2) Indicated flows are metered or estimated from other meter readings. Flows in parentheses are estimated peak flows based on same design parameters used for future estimates, assuming proper wet weather flow regulation and no reduction of flow due to excessive overflows caused by surcharging of the main intercepting sewer. (3) Future flows are estimated as described in Chapter IV.

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Branch Intercepting Sewer	Sewer Size and Slope	Sewer Capacity (1) (mgd)	Wet Weather Peak Flows Present (2) (mgd)	Wet Weather Peak Flows Future (3) (mgd)	Annual Average Flows Present (2) (mgd)	Annual Average Flows Future (3) (mgd)
			> = Over			
Rutherford/Lyndhurst						
Rutherford - Rutherford St. Meter - Influent Sewer	24"@0.0013	4.56	1.05 (1.6)	2.4	0.43	0.72
Garfield/Wallington/Passaic						
Garfield Meter - Influent S.	33"@0.0011	11.4	(9.2)	14.5	4.73	6.56
Lodi St. Meter - Influent S.	48"@0.00085	27.2	15.25	18.5	7.08	8.88
Downstream of Hathaway St. Metered Connection *	54"@0.00085	37.1	16.75	21.6	7.66	10.36
Rutherford/East Rutherford						
Rutherford - Madison Street Meter - Effluent Sewer	24"@0.00120	4.41	(1.0)	1.3	0.24	0.37
East Rutherford Meter - Inf. S.	27"@0.00095	6.17	2.50 (3.0)	4.6	1.10	1.71
Downstream of Van Winkle Street Metered Connection*	36"@0.00080	12.4	2.60 (3.3)	4.8	1.14	1.81
Lowe Street and Wood Street						
Wood Street Sewer	12"@0.00346	1.16	>0.2 (0.38)	0.39	0.08	0.08
Lowe Street Sewer	12"@0.0020	0.90	>0.4 (0.69)	0.70	0.16	0.17
Warren Street						
Downstream of Bergen Street Regulator	24"@0.0015	4.91	>1.2 (1.9)	2.6	0.44	0.65
18-Inch Siphon	-	1.73	>1.2 (1.9)	2.6**	0.44	0.65**
Downstream of Warren Street Regulator	30"@0.00145	10.1	>2.6 (3.5)	4.9**	0.94	1.42**
Lawrence Street						
Downstream of North Straight Street Regulator	15"@0.0025	1.81	>0.5 (1.1)	1.6	0.34	0.43
Downstream of Stout Street Regulator	36"@0.0009	12.9	>5.0 (8.9)	10.8	3.22	4.20
30-Inch Siphon & Regulator	-	12.3	>5.5 (10.0)	12.4**	3.56	4.64**
Downstream of Lawrence Street Regulator	36"@0.00062	10.7	>5.5 (10.0)	12.4**	3.56	4.64**
Prospect Street						
Downstream of Totowa Regulator	16"@0.0080	3.8	>0.4 (0.90)	1.2	0.23	0.29

(1) (2) (3) See explanations on page 1 of this table.
* All meters, except the Van Winkle and Hathaway Street meters in Wallington, are in-line meters.
** Indicates that actual future flows will be either reduced or eliminated due to proposed revisions.

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Table V-T-3

STATIONING REFERENCES TO CONTRACT DRAWINGS

Overall Stationing*	Contract Drawing Stationing: Contract No.	Contract Drawing Stationing: Station
0 + 00 to 10 + 13.94	41	0 + 00 to 10 + 13.94
10 + 13.94 to 27 + 13.94	25	9 + 00 to 26 + 00
27 + 13.94 to 41 + 13.49	26	0 + 00 to 13 + 99.55
41 + 13.49 to 57 + 13.94	32	13 + 99.55 to 30 + 00
57 + 13.94 to 116 + 12	11	0 + 00 to 58 + 98
116 + 12 to 124 + 12.70	221	0 - 27.01 to 7 + 73.70
124 + 12.70 to 195 + 18.0	11	66 + 74 to 137 + 79.30
195 + 18.0 to 212 + 93	8	0 + 00 to 17 + 75
212 + 93 to 229 + 93	33	0 + 00 to 17 + 00
229 + 93 to 262 + 94	56	0 + 00 to 33 + 00.95
262 + 94 to 302 + 93.95	5	0 + 00 to 40 + 00
302 + 93 to 308 + 18.44	46	0 + 00 to 5 + 24.485
308 + 18.44 to 408 + 60.44	10	0 + 08 to 100 + 50
408 + 60.44 to 473 + 64.57	14	-0 + 04.13 to 65 + 00
473 + 64.57 to 479 + 88.8	48	-0 + 04.52 to 6 + 19.69
479 + 88.8 to 539 + 88.8	19	0 + 00 to 60 + 00
539 + 88.8 to 621 + 08.8	39	0 + 00 to 81 + 20
621 + 08.8 to 653 + 68.6	52	0 + 06 to 32 + 65.8
653 + 68.6 to 726 + 43.6	3	0 + 00 to 72 + 75
726 + 43.6 to 810 + 92.4	4	0 + 01.2 to 84 + 50
810 + 92.4 to 880 + 42.4	40	0 + 00 to 69 + 50
880 + 42.4 to 940 + 24.4	50	0 + 00 to 59 + 82
940 + 24.4 to 988 + 24.4	44	0 + 00 to 48 + 00
988 + 24.4 to 1022 + 19.4	55	0 + 00 to 33 + 95
1022 + 19.4 to 1072 + 25.4	53	0 + 00 to 50 + 06
1072 + 25.4 to 1120 + 23.0	54	0 + 00 to 47 + 97.6

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* Note: Stationing [illegible] this report

TABLE V-T-2

EXISTING MAIN INTERCEPTOR - CAPACITIES AND FLOWS

Municipality	Connection	(1) Station	(2) Sewer Size (ft.)	(3) Slope (Feet/1000 Feet)	(3) Roughness Factor "n"	(3) Capacity (mgd) (Full)	(3) Equivalent Hydraulic Capacity (mgd)	(4) Present Flows - mgd Average Daily	(4) Present Flows - mgd Peak Rates Dry Weather	(4) Present Flows - mgd Peak Rates Wet Weather	(5) Future Flows - mgd Average Daily	(5) Future Flows - mgd Peak Rates Dry Weather	(5) Future Flows - mgd Peak Rates Wet Weather	(6) Future Peak Flow in Excess of Capacity (mgd)	(7) Proposed Design Flow (mgd)
PATERSON and HALEDON	Prospect St.(incl.part of HALEDON)	1120+23						6.14	8.88	10.6	7.12	15.3	19.6	--	19.6
PATERSON	Prospect St. Branch Sewer	1119+76						6.37	9.12	11.0	7.41	15.8	20.8	--	20.8
PATERSON	Mulberry Street	1117+67	3.75C	0.713	0.013	20.8	20.8	6.43	9.20	11.1	7.52	16.0	21.3	0.5	21.3
PATERSON	Broadway	1115+10						6.49	9.27	11.2	7.62	16.2	21.8	1.0	21.8
PATERSON	Bank Street	1112+23						6.55	9.35	11.3	7.72	16.4	22.3	1.5	22.3
		1101+93*						6.55	9.35	11.3	7.72	16.4	22.3	1.5	12.7
PATERSON	Bridge Street	1098+57													
		1091+05						7.69	10.8	13.2	9.12	18.8	27.4	6.6	17.8
		1090+95						7.69	10.8	13.2	9.12	18.8	27.4	--	17.8
PATERSON and HALEDON	**Lawrence St.Branch Interceptor (incl. HARMON COLOR WORKS)	1090+75		0.597	0.013	35.9	35.9	11.3	14.9	18.7	13.8	26.7	39.8	3.9	17.8
PATERSON	Montgomery Street	1087+15													
		1087+10						15.3	19.7	24.8	22.3	41.1	56.7	20.8	34.7
PATERSON	Lafayette and Straight Streets	1082+80	4.75C												
PATERSON	Franklin Street	1080+40		0.738	0.013	39.9	39.9	16.7	21.5	27.0	23.8	43.3	62.1	22.2	40.1
PATERSON	Keen Street	1077+05						16.9	21.7	27.2	23.9	43.8	63.1	23.2	41.1
		1073+95						17.1	21.9	27.6	24.1	44.2	64.1	24.2	42.1
		1073+85						17.1	21.9	27.6	24.1	44.2	64.1	17.7	42.1
PATERSON and PROSPECT PARK	*** Warren St.Branch Interceptor (incl. PROSPECT PARK)	1073+51													
PATERSON	Lowe St. Branch Lateral	1055+29						18.0	23.6	30.2	25.6	46.0	69.1	22.7	45.0
PATERSON	Ultra Chemical Works (Wood Street)	1052+97						18.2	24.0	30.6	25.7	46.1	69.8	23.4	45.7
PATERSON	Associated Dyeing & Fin.(Bleeker St.)	1050+67		0.441	0.013	46.4	46.4	18.5	24.5	31.0	26.1	47.0	70.7	24.3	46.6
PATERSON	Sixth Avenue	1045+13						19.8	27.4	33.9	27.7	49.5	74.7	28.3	50.6
PATERSON	Fifth Avenue (East 5th Street)	1035+55*						20.0	27.7	34.2	27.8	49.6	75.4	29.0	51.3
		1022+19													
PATERSON	East 11th Street	1020+55						20.7	30.1	36.9	28.6	51.1	78.3	31.9	43.4
HAWTHORNE	**HAWTHORNE	1011+84		0.448	0.013	46.6	46.6	21.4	31.1	38.0	29.4	51.9	81.6	35.0	46.7
PATERSON	Fourth Avenue	1011+61	5.42H					24.2	35.0	42.6	33.8	58.4	92.0	45.4	46.7
		988+24						24.3	35.2	42.9	34.0	58.6	92.8	46.2	47.5

(See page 6 for Notes.)

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Municipality	Connection	(1) Station	(2) Sewer Size (ft.)	Slope (Feet/1000 Feet)	(3) Roughness Factor "n"	Capacity (mgd) (Full)	Equivalent Hydraulic Capacity (mgd)	(4) Present Flows - mgd: Average Daily	Peak Rates: Dry Weather	Peak Rates: Wet Weather	(5) Future Flows - mgd: Average Daily	Peak Rates: Dry Weather	Peak Rates: Wet Weather	(6) Future Peak Flow in Excess of Capacity (mgd)	(7) Proposed Design Flow (mgd)
FAIR LAWN	**FAIRLAWN INDUSTRIES	975+60													
PATERSON	Second Avenue	971+08						24.5	35.8	44.4	34.3	59.8	93.5	43.7	47.5
GLEN ROCK	**GLEN ROCK	970+98						25.3	37.4	46.1	35.1	60.9	96.5	46.7	50.5
FAIR LAWN	**FAIR LAWN - Second Avenue	970+44						26.3	38.6	48.1	36.7	61.6	100	50.4	50.5
PATERSON	Third Avenue	962+10	5.42H	0.511	0.013	49.8	49.8	26.9	39.4	50.1	37.8	64.6	102	52.3	50.5
PATERSON	Fifth Avenue	947+74*						27.8	41.4	52.3	38.7	66.6	106	55.7	53.9
PATERSON	Eighth Avenue	928+98						29.2	43.6	54.5	40.0	68.2	108	58.1	41.9
PATERSON	Ninth Avenue	921+50						29.3	43.7	54.6	40.1	68.4	108	58.4	42.2
		907+04						29.4	43.8	54.7	40.2	68.9	109	58.7	42.5
PATERSON	Tenth Avenue (East 33rd Street)	906+94						29.4	43.8	54.7	40.2	68.9	109	51.5	42.5
		906+87													
FAIR LAWN	**FAIR LAWN - East 36th Street	899+22		0.494	0.013	57.4		32.5	47.8	59.9	44.9	74.6	122	64.5	55.5
		880+42													
PATERSON	East 43rd Street	879+52	5.75H				57.0	34.9	50.8	63.4	48.7	79.2	128	71.3	55.5
EAST PATERSON	**EAST PATERSON NO. 3	857+25		0.486	0.013	56.7		35.1	51.0	63.6	49.0	79.5	129	71.6	55.8
PATERSON	Overlook Avenue	852+52						35.5	51.6	64.4	49.6	81.7	130	72.7	55.8
		840+92						35.6	51.7	64.7	49.7	81.9	130	72.8	55.9
		840+82													
PATERSON	Twentieth Avenue	822+14						35.6	51.7	64.7	49.7	81.9	130	70.4	55.9
EAST PATERSON	**MARCAL PAPER CO.	817+10	6.00H	0.419	0.013	59.4	59.4	36.0	52.5	65.6	50.2	82.4	132	72.4	57.9
		811+02						38.5	56.3	69.4	53.4	87.3	137	77.2	57.9
		810+92													
PATERSON and	Market Street and **EAST PATERSON NO. 1 and 2	809+57	6.75H	0.423	0.013	81.5	81.5	38.5	56.3	69.4	53.4	87.3	137	55.1	57.9
		782+58						47.7	68.0	84.8	66.6	105	167	85.8	84.9
			PATERSON VENTURI METER CHAMBER (Capacity = 76 ± mgd)											91 ±	
		781+50													
CLIFTON	Dundee Avenue	771+96						47.7	68.0	84.8	66.6	105	167	83.2	84.9
			6.75H	0.424	0.0125	84.9									
							84.1								

(See page 6 for Notes.)

KLL001585

Municipality	Connection	(1) Station	(2) Sewer Size (ft.)	Slope (Feet/1000 Feet)	(3) Roughness Factor "n"	Capacity (mgd) (Full)	Equivalent Hydraulic Capacity (mgd)	(4) Present Flows - mgd: Average Daily	Peak Rates: Dry Weather	Peak Rates: Wet Weather	(5) Future Flows - mgd: Average Daily	Peak Rates: Dry Weather	Peak Rates: Wet Weather	(6) Future Peak Flow in Excess of Capacity (mgd)	(7) Proposed Design Flow (mgd)
CLIFTON (NORTH)	Dundee Avenue	771+96						47.7	68.0	84.8	66.6	105	167	83.2	84.9
			6.75H	0.424	0.0125	84.9		47.8	68.3	85.0	66.8	105	168	83.4	85.1
CLIFTON (NORTH)	Merselis Avenue	748+77													
		741+92					84.1	48.5	69.3	86.0	67.8	106	169	87.8	86.8
GARFIELD	**GARDEN STATE PAPER CO.	741+78													
								56.4	77.3	94.0	77.7	120	179	95.2	86.8
CLIFTON (NORTH)	Arlington Avenue	727+97	6.75C	0.486	0.0129	83.5									
								57.0	78.1	94.8	78.7	121	181	96.8	88.4
		713+69*													
								57.0	78.1	94.8	78.7	121	181	96.8	68.7
CLIFTON (NORTH)	Whippany Paper Co. (Ackerman Av.)	706+84													
		698+94						60.0	82.4	101	79.9	123	183	98.9	70.8
		698+84						60.0	82.4	101	79.9	123	183	75	70.8
CLIFTON (NORTH)	Hope Avenue No. 1	697+69													
								60.4	83.1	102	80.6	125	184	76	71.7
CLIFTON (NORTH)	Hope Avenue No. 2	694+49													
				0.353	0.0111	115		67.5	92.2	112	91.4	139	200	92	87.6
CLIFTON (NORTH)	Highland Avenue	693+80													
								67.7	92.5	112	91.6	139	200	92	87.9
PASSAIC	President Street	689+15													
		666+84						67.9	92.9	113	91.9	139	200	92	88.0
PASSAIC	Madison Street	660+29													
				0.426	0.0121	116		68.1	93.5	113	92.1	140	201	93	88.5
PASSAIC	Jefferson Street	657+28													
		653+69						69.4	94.4	114	93.5	141	203	95	90.9
PASSAIC	Washington Place	653+18	7.50H				108								
								70.3	95.9	115	94.7	142	204	96	92.1
PASSAIC	Passaic Street	647+63													
								70.5	96.4	115	94.9	142	205	97	92.5
PASSAIC	Park Place	632+83													
								70.6	96.5	115	95.0	143	205	97	92.9
				0.415	0.0138	100									
WALLINGTON, PASSAIC, GARFIELD, SADDLE BROOK, EAST RUTHERFORD, RUTHERFORD and LODI	WALLINGTON PUMPING STATION and LODI FORCE MAIN	621+97													
		621+19						84.5	120	150	114.7	168	234	126	122
		621+09		0.412		191		84.5	120	150	114.7	168	234	71	122
		619+15			0.0101			84.5	120	150	114.7	168	234	71	122
PASSAIC	Gregory Avenue	613+45		0.432		196									
			8.50H				163	84.6	120	151	114.8	168	235	72	123
PASSAIC	Lafayette Avenue	602+01													
					0.0125	132		86.7	124	154	117.7	171	239	76	127
		590+99		0.299				86.7	124	154	117.7	171	239	76	127

(See page 6 for Notes.)

KLL001586

Municipality	Connection	(1) Station	(2) Sewer Size (ft.)	Slope (Feet/1000 Feet)	(3) Roughness Factor "n"	Capacity (mgd) (Full)	Equivalent Hydraulic Capacity (mgd)	(4) Present Flows - mgd: Average Daily	Peak Rates: Dry Weather	Peak Rates: Wet Weather	(5) Future Flows - mgd: Average Daily	Peak Rates: Dry Weather	Peak Rates: Wet Weather	(6) Future Peak Flow in Excess of Capacity (mgd)	(7) Proposed Design Flow (mgd)
		590+89						86.7	124	154	117.7	171	239	76	127
PASSAIC	Aycrigg Avenue	590+59					163								
								87.2	125	154	118.4	172	240	77	128
PASSAIC	Van Houten Avenue	576+25													
								87.3	125	154	118.5	172	240	77	128
PASSAIC	Elliot Street	570+39	9.00H	0.348	0.0129	160									
								87.3	125	155	118.6	172	240	77	128
PASSAIC	Howard Avenue	564+10													
								90.2	129	158	121.8	177	244	81	132
PASSAIC	Brook Avenue	554+25													
		541+49						90.2	130	159	122.3	178	245	82	133
		PASSAIC VENTURI METER CHAMBER (Capacity = 154 ± mgd)												91 ±	
		540+24				170		90.2	130	159	122.3	178	245	68	133
		479+99	9.00H	0.350				90.2	130	159	122.3	178	245	68	133
		479+89			0.0122			90.2	130	159	122.3	178	245	68	133
CLIFTON (SOUTH)	Yantacaw Street	479+44					177								
			10.00H	0.313		213		93.2	134	167	126.3	182	250	73	138
LYNDHURST and RUTHERFORD	YANTACAW PUMPING STATION	479+28													
		479+25						96.2	139	175	130.1	187	255	78	143
		479+13						96.2	139	175	130.1	187	255	78	143
		THIRD RIVER SIPHON AND YANTACAW BYPASS (Capacity = 172 ± mgd)												83 ±	
		473+78						96.2	139	175	130.1	187	255	71	143
		473+65						96.2	139	175	130.1	187	255	71	143
NUTLEY	Federal Telephone & Telegraph	473+57													
								96.2	139	175	130.1	187	255	71	143
NUTLEY, CLIFTON and BELLEVILLE	Golf Club (including HOFFMANN LA ROCHE & part of BELLEVILLE)	458+00													
								105.2	150	189	141.6	199	270	86	158
NUTLEY	Nutley Avenue	445+84		0.266	0.0130	184	184								
								105.3	150	189	141.7	200	270	86	158
NUTLEY	Park Avenue	429+36													
								105.6	151	189	142.2	200	271	87	159
NUTLEY and BELLEVILLE	Nutley-Belleville Line	408+72													
								106.0	151	190	142.7	201	271	87	159
		398+77	10.00H					106.0	151	190	142.7	201	271	87	159
BELLEVILLE	Roosevelt Avenue (Kidde No. 2)	390+77													
								106.2	151	190	143.0	201	272	72	160
BELLEVILLE	Roosevelt Avenue (Kidde No. 1)	386+16													
				0.299	0.0127	200	200	106.4	152	190	143.4	202	273	73	161
BELLEVILLE	Mansion Place	377+45													
								106.5	152	190	143.5	202	273	73	161
BELLEVILLE	Terry Street	362+43													
		336+90						107.6	153	192	144.9	203	275	75	163

(See page 6 for Notes.)

KLL001567

Municipality	Connection	(1) Station	(2) Sewer Size (ft.)	Slope (Feet/1000 Feet)	(3) Roughness Factor "n"	Capacity (mgd) (Full)	Equivalent Hydraulic Capacity (mgd)	(4) Present Flows - mgd: Average Daily	Peak Rates: Dry Weather	Peak Rates: Wet Weather	(5) Future Flows - mgd: Average Daily	Peak Rates: Dry Weather	Peak Rates: Wet Weather	(6) Future Peak Flow in Excess of Capacity (mgd)	(7) Proposed Design Flow (mgd)
BELLEVILLE, NORTH ARLINGTON and KEARNY	Academy Street, NORTH ARLINGTON and KEARNY	336+80						107.6	153	192	144.9	203	275	59	163
		335+99	10.50H	0.254	0.0123	216	216								
BELLEVILLE	Mill Street	309+50						108.8	155	193	146.5	205	277	61	165
		308+02						109.7	156	195	147.6	206	278	62	166
		307+96						109.7	156	195	147.6	206	278	62	166
		SECOND RIVER SIPHON AND VENTURI METER CHAMBER (Capacity = 182 ± mgd)												96 ±	
BELLEVILLE, GLEN RIDGE, MONTCLAIR, ORANGE, BLOOMFIELD, NEWARK, EAST ORANGE, and LITTLE FALLS	UNION OUTLET	304+36						109.7	156	195	147.6	206	278	64	166
		303+77	10.50H	0.261	0.0189	143									
NEWARK	Verona Avenue	293+84						130.3	184	242	176.6	243	340	126	228
		293+64					214	133.1	186	257	180.1	247	349	135	237
		283+43		0.274	0.0120	231									
		283+29	10.83C	0.270	0.0130	216									
		262+94						133.1	186	257	180.1	247	349	135	237
	Delevan Street	258+93	10.50H	0.403	0.0118	286									
		245+59						133.6	187	260	180.7	248	352	138	240
		245+49	11.08H	0.289	0.0120	275		133.6	187	260	180.7	248	352	86	240
NEWARK	Herbert Place	245+26													
		229+93	11.00H	0.209	0.0094	291		135.6	189	268	183.2	251	358	92	246
		213+18						135.6	189	268	183.2	251	358	92	246
NEWARK	3rd and 4th Avenues	212+97					266								
		212+93		0.339	0.0130	270		137.8	191	279	185.9	255	366	100	254
		195+18						137.8	191	279	185.9	255	366	100	254
NEWARK and EAST ORANGE	Clay Street	181+73	11.25C	0.256	0.0130	234		155.9	211	315	208.4	279	415	149	303
		180+74						155.9	211	315	208.4	279	415	149	303

(See page 6 for Notes.)

KLL001568

Municipality	Connection	(1) Station	(2) Sewer Size (ft.)	Slope (Feet/1000 Feet)	(3) Roughness Factor "n"	Capacity (mgd) (Full)	Equivalent Hydraulic Capacity (mgd)	(4) Present Flows - mgd Average Daily	Present Peak Rates Dry Weather	Present Peak Rates Wet Weather	(5) Future Flows - mgd Average Daily	Future Peak Rates Dry Weather	Future Peak Rates Wet Weather	(6) Future Peak Flow in Excess of Capacity (mgd)	(7) Proposed Design Flow (mgd)
				0.256	0.0130	234	266								
		180+74						155.9	211	315	208.4	279	415	149	303
								155.9	211	315	208.4	279	415	148	303
NEWARK	Orange Street	167+72	11.25C												
				0.303	0.0129	257		156.0	211	318	208.5	279	416	149	304
NEWARK	Bridge Street	162+54					267								
		145+76						156.1	212	320	208.6	280	416	149	304
		145+66						156.1	212	320	208.6	280	416	149	304
NEWARK	Saybrook Place and Rector Street	145+11		0.293	0.0128	287									
		124+13						161.6	217	355	215.2	285	435	168	323
NEWARK	City Dock Street	121+96		0.337	0.0171	231									
		116+12					272	166.6	224	400	220.8	292	449	177	337
			11.75C	0.296	0.0126	293									
		89+39						166.6	224	400	220.8	292	449	177	337
NEWARK, EAST NEWARK, HARRISON and KEARNY	Van Buren Street Lateral	89+09						166.6	224	400	220.8	292	449	143	337
				0.344	0.0130	306	306								
		57+14						184.8	245	450	244.5	318	525	219	413
		56+99						184.8	245	450	244.5	318	525	168	413
NEWARK	Jabez Street	56+59													
			12.75C	0.308	0.0130	359		203.2	266	505	266.7	341	572	215	460
NEWARK	Avenue K	49+12													
		42+93						203.6	267	506	267.2	342	573	216	461
		42+83						203.6	267	506	267.2	342	573	216	461
NEWARK	Avenue L	40+94													
				0.308	0.0126	370	357	205.4	269	508	269.0	345	575	218	463
NEWARK	Wilson Avenue No. 1	21+14													
		10+14	12.50H					207.9	273	512	275.7	352	585	228	473
NEWARK	Wilson Avenue No. 2	8+65													
								213.3	279	518	286.7	366	600	243	488
NEWARK	Avenue P	3+15		0.276	0.0139	317									
								213.3	279	518	298.1	381	616	259	504
		2+01													
NEWARK BAY PUMPING STATION AND TREATMENT PLANT								237.6	307	573	349.0	439	720		

NOTES:

(1) Stationing is from the inlet of the existing Grit Chambers. The South Newark Interceptor Connection is at Station 0+35. The existing Main Interceptor will connect to the proposed Head End Facilities at Station 2+01.

(2) "C" or "H" indicate circular or Horseshoe shaped conduit.

(3) The Manning Factor is used; this factor is from the computed Hydraulic Gradient at present wet weather peak flow and is an equivalent factor based on frictional loss at n = 0.012 (assumed) for steady uniform flow in a straight section of pipe, plus additional losses due to bends, section changes and inflows. An equivalent factor of not less than n = 0.013 is used upstream of the Paterson Venturi Meter.

(4) Present flows (1967 - 1969) are based on actual readings wherever possible and adjusted where required. The wet weather peak flow is with all four pumps working and all regulating gates opened (a rare occurrence) and is based on data from the storms of February 3 and April 2, 1970. Peak rate for this last storm was 510 mgd, with the South Newark Interceptor gate throttled. Maximum pumping capacity with 3 and 4 pumps is approximately 450 and 550 mgd.

(5) Future flows are as estimated for the year 2040. Indicated peak rates are the maximum rates anticipated in the Interceptor at the given stations.

(6) The indicated rates are in excess of the "Equivalent Hydraulic Capacity".

(7) Ultimate Wet-Weather Peak Flows to be carried by the existing interceptor. Balance of flows to be carried by the Proposed Facilities - Relief Interceptor Alternatives (c) and (e) (see Table 8) and Outlet Alternative 1 or 7 (see Plate 1).

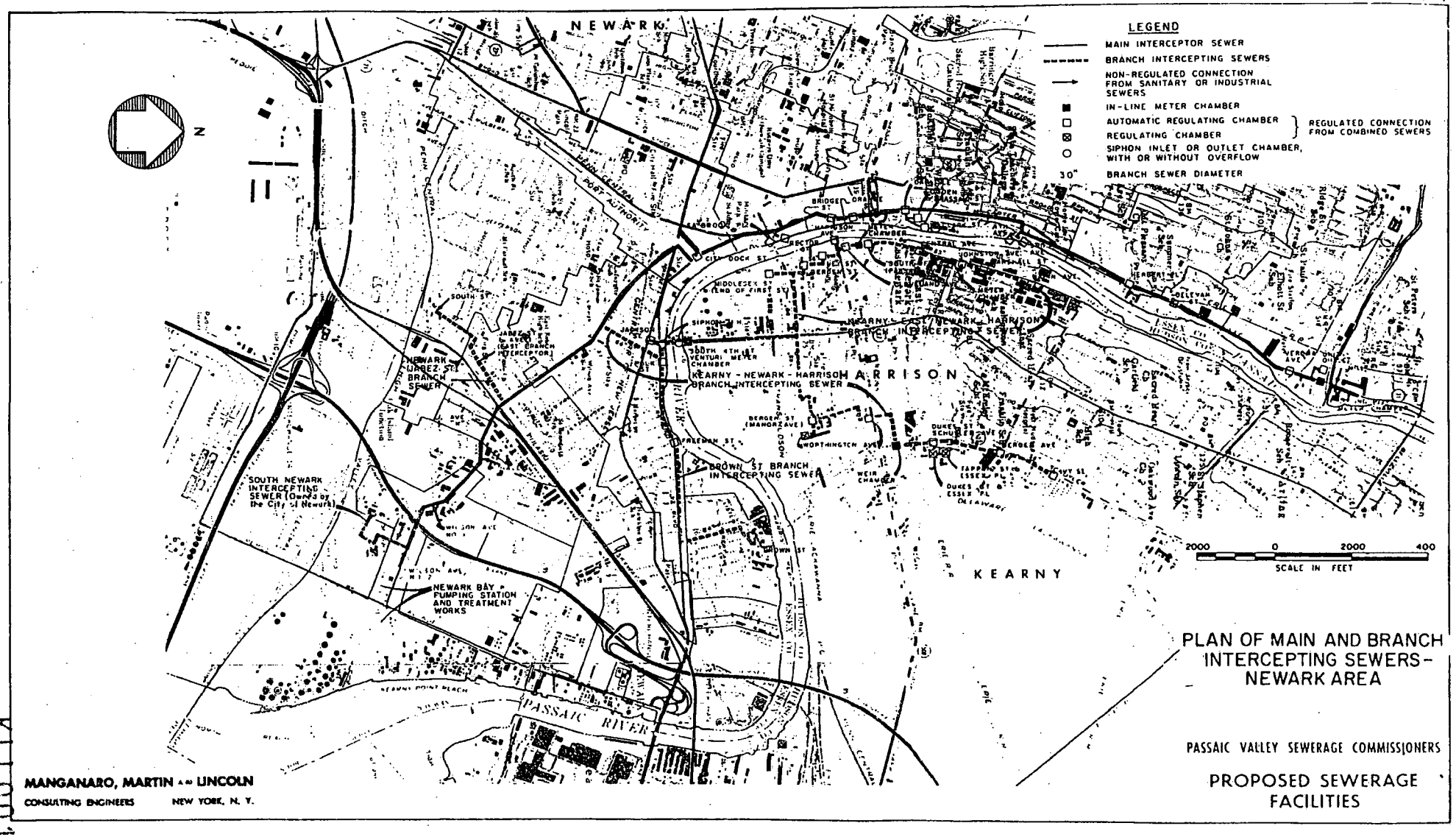
* Flow to be transferred to the Proposed Facilities from this station.

** Flow from this connection is to be intercepted in toto by the Proposed Facilities and is excluded from the Design Flow.

*** Flow from this connection is to be intercepted in part by the Proposed Facilities and that part is excluded from the Design Flow.

KLL001589

PLATE V-P-1



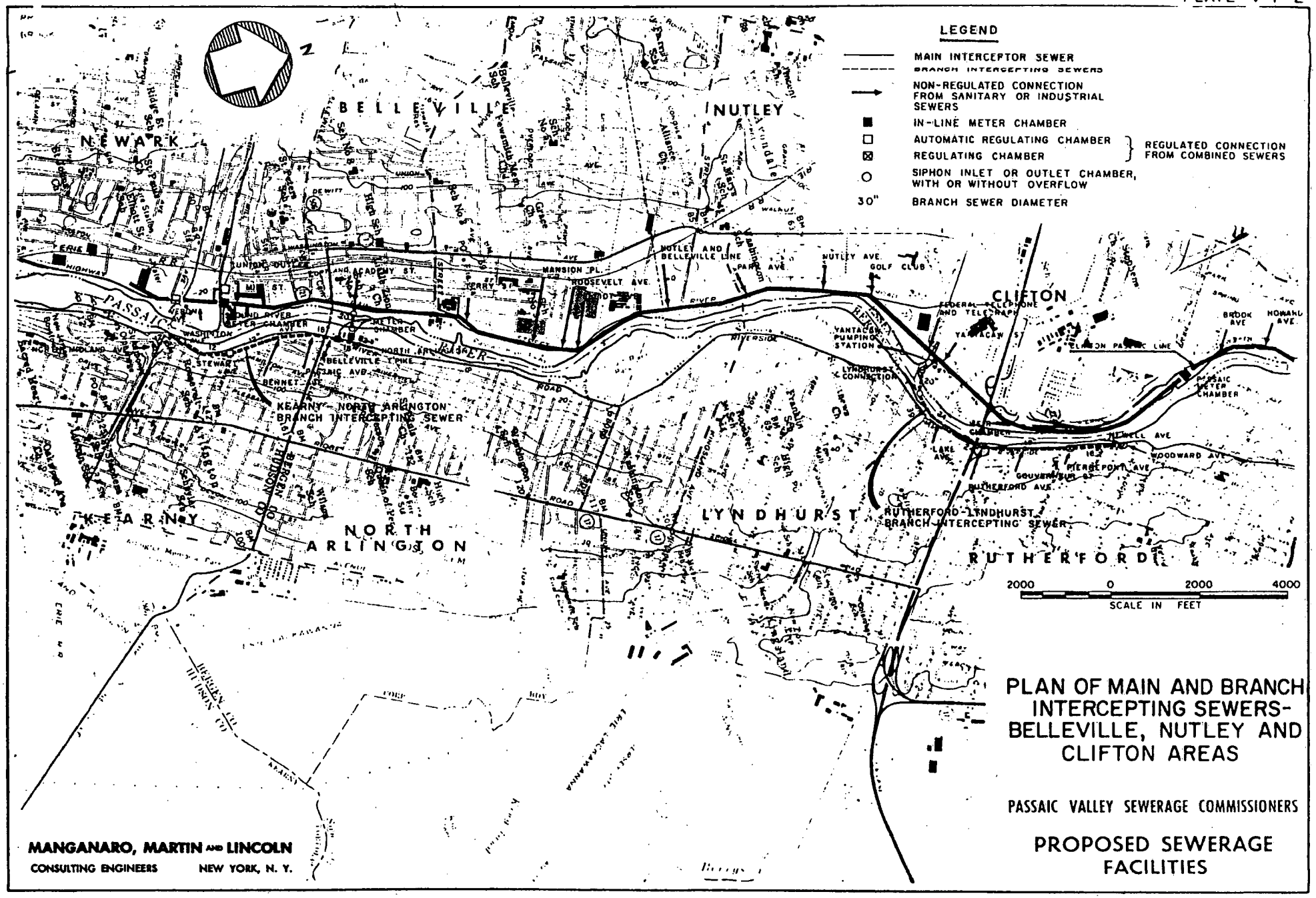
PLAN OF MAIN AND BRANCH INTERCEPTING SEWERS - NEWARK AREA

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PROPOSED SEWERAGE FACILITIES

MANGANARO, MARTIN AND LINCOLN
CONSULTING ENGINEERS NEW YORK, N. Y.

KLL001590



PLAN OF MAIN AND BRANCH INTERCEPTING SEWERS-BELLEVILLE, NUTLEY AND CLIFTON AREAS

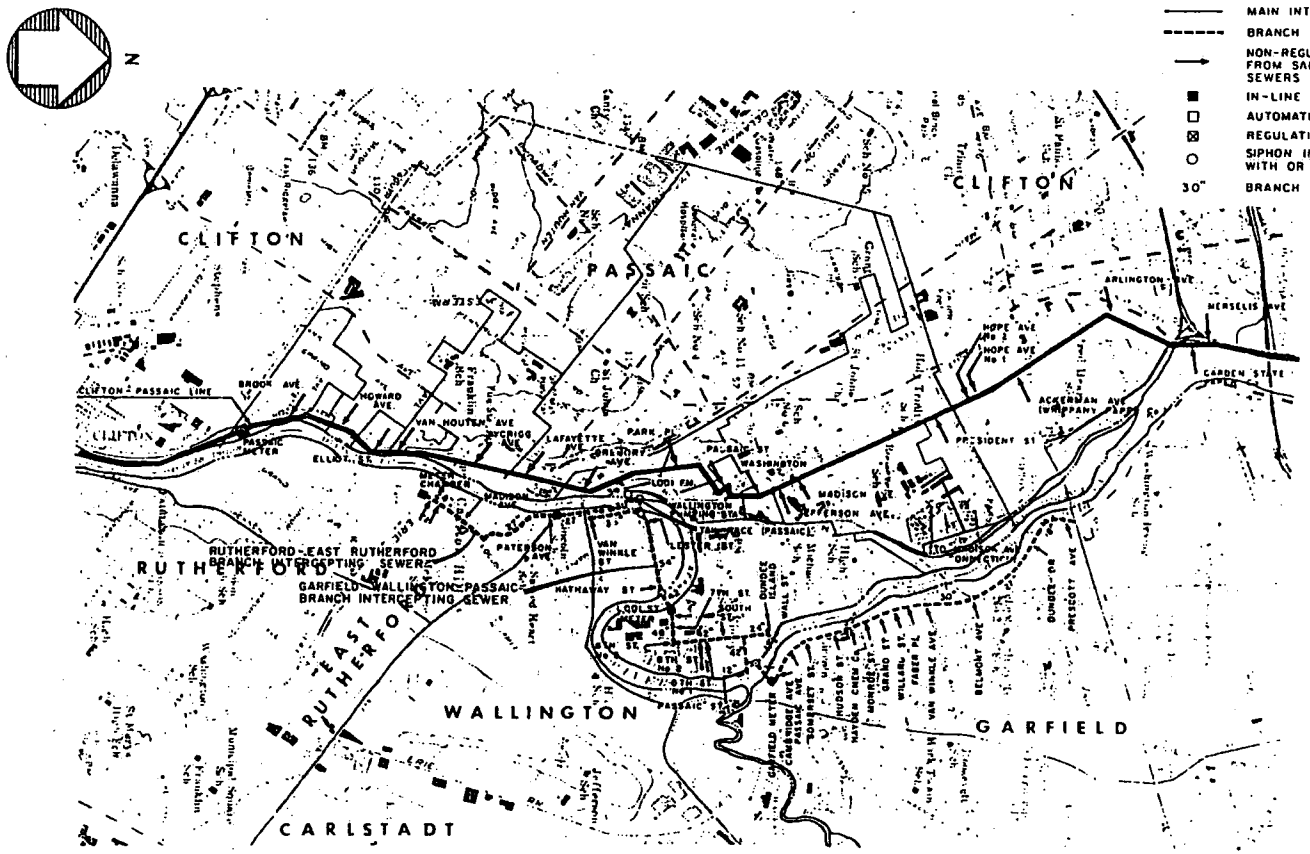
PASSAIC VALLEY SEWERAGE COMMISSIONERS

PROPOSED SEWERAGE FACILITIES

MANGANARO, MARTIN AND LINCOLN
CONSULTING ENGINEERS NEW YORK, N. Y.

KLL001591

PLATE V-P-3



LEGEND

- MAIN INTERCEPTOR SEWER
- BRANCH INTERCEPTING SEWERS
- NON-REGULATED CONNECTION FROM SANITARY OR INDUSTRIAL SEWERS
- IN-LINE METER CHAMBER
- AUTOMATIC REGULATING CHAMBER } REGULATED CONNECTION FROM COMBINED SEWERS
- REGULATING CHAMBER
- SIPHON INLET OR OUTLET CHAMBER, WITH OR WITHOUT OVERFLOW
- 30" BRANCH SEWER DIAMETER

2000 0 2000 4000
SCALE IN FEET

PLAN OF MAIN AND BRANCH INTERCEPTING SEWERS-PASSAIC AND CLIFTON AREAS

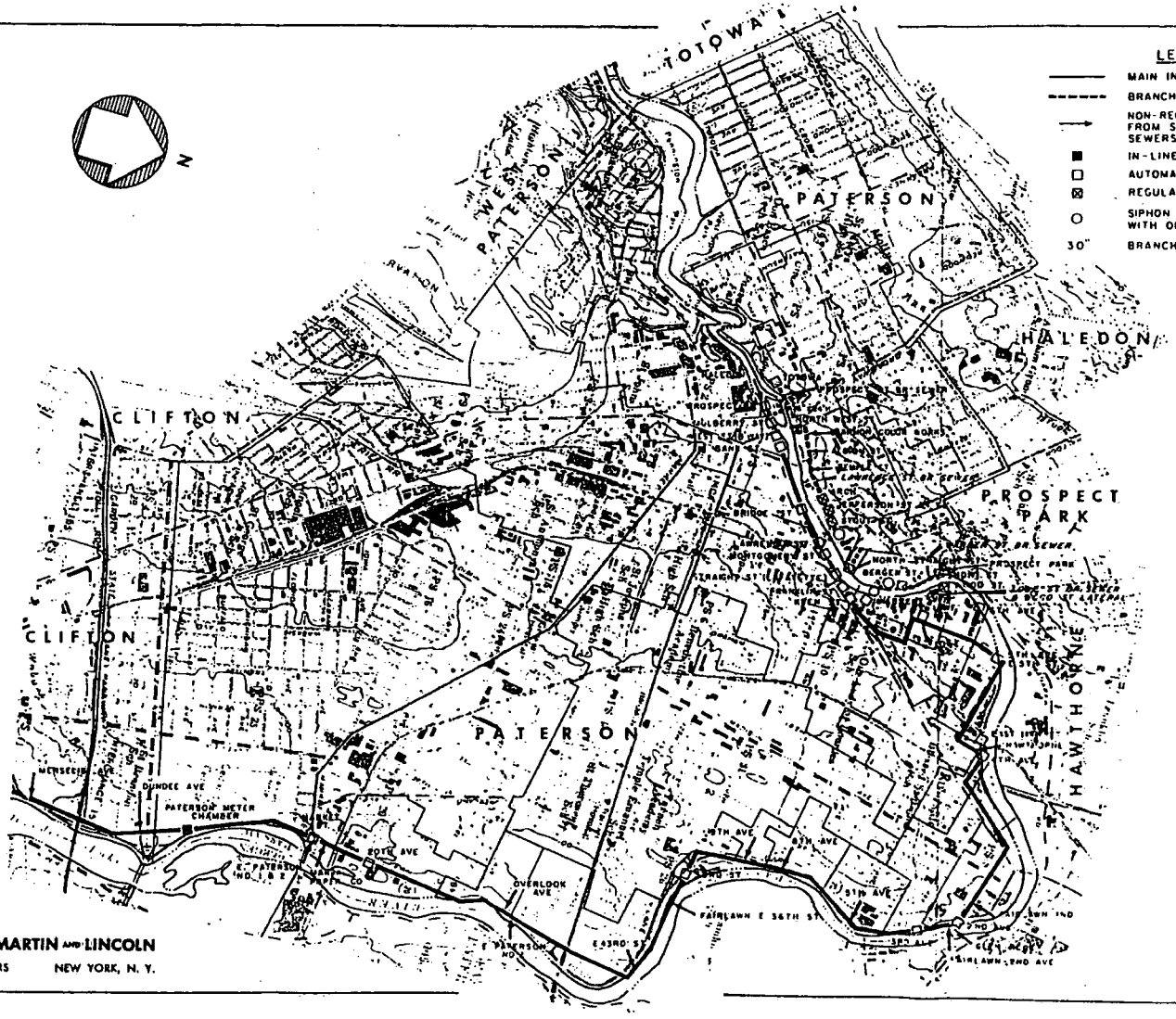
PASSAIC VALLEY SEWERAGE COMMISSIONERS

PROPOSED SEWERAGE FACILITIES

MANGANARO, MARTIN AND LINCOLN
CONSULTING ENGINEERS NEW YORK, N. Y.

KLL001592

PLATE V-P-4



LEGEND

- MAIN INTERCEPTOR SEWER
- BRANCH INTERCEPTING SEWERS
- NON-REGULATED CONNECTION FROM SANITARY OR INDUSTRIAL SEWERS
- IN-LINE METER CHAMBER
- AUTOMATIC REGULATING CHAMBER } REGULATED CONNECTION FROM COMBINED SEWERS
- REGULATING CHAMBER
- SIPHON INLET OR OUTLET CHAMBER, WITH OR WITHOUT OVERFLOW
- 30" BRANCH SEWER DIAMETER

2000 0 2000 4000
SCALE IN FEET

PLAN OF MAIN AND BRANCH INTERCEPTING SEWERS - PATERSON AREA

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PROPOSED SEWERAGE FACILITIES

MANGANARO, MARTIN AND LINCOLN
CONSULTING ENGINEERS NEW YORK, N. Y.

KLL001523

LEGEND

- MUNICIPAL BOUNDARY
- 12'-9" ⌀ — DIAMETER OF CIRCULAR SECTION
- 12'-6" x 12'-6" — SIZE OF HORSESHOE SECTION (SEE DETAIL)
- 0.308 — CONDUIT SLOPE IN FEET PER THOUSAND FEET
- INV. 87.35 — INVERT ELEV. OF INTERCEPTOR AT INDICATED STATION (1) (2)
- 9.60 — INVERT ELEVATION OF REGULATING GATE (3) (OR OVERFLOW WEIR)
- JABEZ ST. 56+59 — NAME (OR LOCATION) OF LOCAL CONNECTING SEWER; INTERCEPTOR STATION AT CONNECTING LOCAL SEWER

NOTES

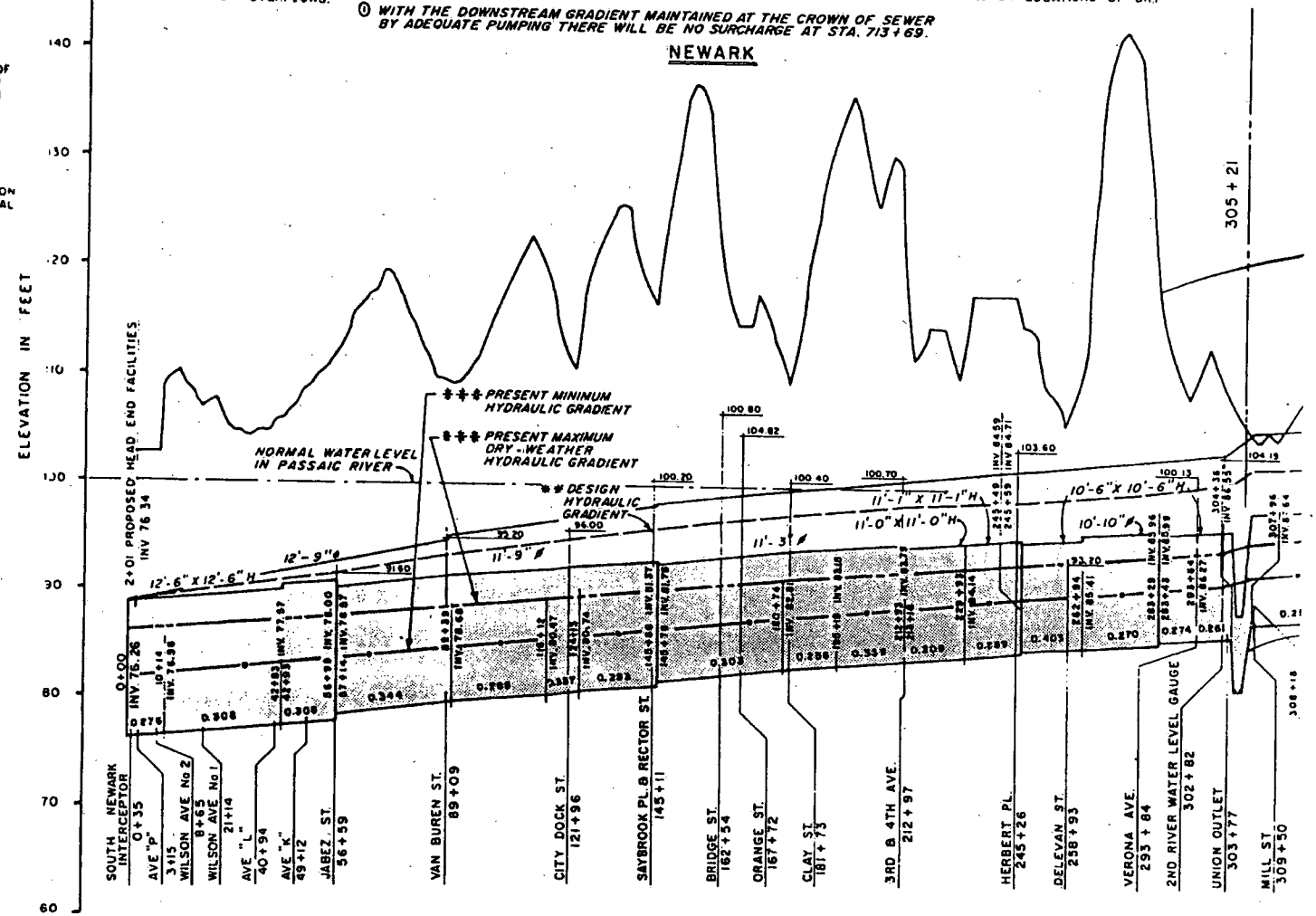
1. ELEVATIONS ARE BASED ON MEAN SEA LEVEL = 100.00
2. STATIONING IS IN FEET FROM THE EXISTING GRIT CHAMBER INLET BELL
3. WHERE SEVERAL REGULATING CHAMBERS CONNECT TO THE INTERCEPTOR VIA ONE PIPE, THE LOWEST ELEVATION IS INDICATED.
4. ACTUAL FIELD DATA AS TO STATIONS, ELEVATIONS AND SLOPES ARE USED WHERE AVAILABLE.

* COMPUTED HYDRAULIC GRADIENT BASED ON STORM OF APRIL 2, 1970 (ALL FOUR PUMPS RUNNING) ASSUMING NO SURCHARGE AT STATION 0+00 SEE TABLE V-T-2 FOR FLOWS ALONG INTERCEPTOR

** COMPUTED HYDRAULIC GRADIENT BASED ON ULTIMATE WET WEATHER PEAK FLOW (EXCLUDING ADDITION OF NORTHWEST BERGEN COUNTY FLOWS) LESS 113 MGD REMOVED AT STATION 713+69. GRADIENT IS SHOWN BETWEEN STATIONS 2+01 AND 713+69, ASSUMING NO SURCHARGE AT EITHER END STATION. (1) SEE TABLE V-T-2 FOR FLOWS ALONG INTERCEPTOR. ABOVE STATION 713+69, THE INTERCEPTOR IS ASSUMED TO BE RELIEVED BY THE PROPOSED PATERSON RELIEF INTERCEPTOR AND THE DESIGN HYDRAULIC GRADIENT WILL APPROXIMATELY MATCH CONDUIT CROWN.

*** HYDRAULIC GRADIENTS OF SUNDAY, JUNE 21, 1970 (MINIMUM) AND WEDNESDAY, JUNE 24, 1970 (MAXIMUM) DRAWN FROM ACTUAL LEVEL RECORDINGS AT SEVEN INDICATED GAUGING STATIONS MAXIMUM DRY-WEATHER GRADIENT WAS EXTENDED UPSTREAM BASED ON LOCATIONS OF DRY WEATHER OVERFLOWS.

(1) *WITH THE DOWNSTREAM GRADIENT MAINTAINED AT THE CROWN OF SEWER BY ADEQUATE PUMPING THERE WILL BE NO SURCHARGE AT STA. 713+69.*



MANGANARO, MARTIN AND LINCOLN
CONSULTING ENGINEERS NEW YORK, N. Y.

KL10015 94

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

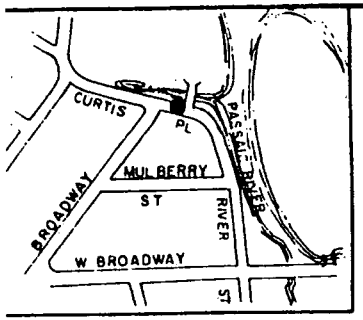
PASSAIC RIVER OVERFLOWS

CURTIS PLACE, PATERSON
P-001

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001609



LOCATION PLAN

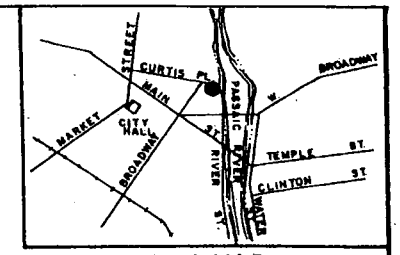
SCALE IN FEET

NOTE

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

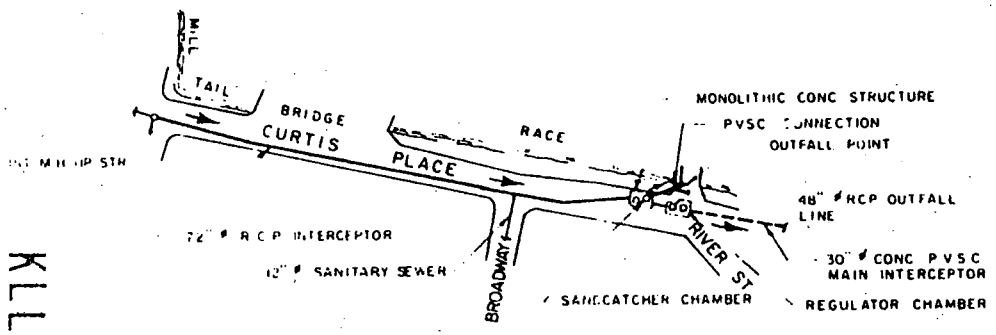
LEGEND:

→ DIRECTION OF FLOW
S C = SAND CATCHER
T.G. = TIDE GATE
UP STR = UP STREAM
DN STR = DOWN STREAM
N T S = NOT TO SCALE
R.C.P. = REINFORCED CONCRETE PIPE
● = OVERFLOW LOCATION



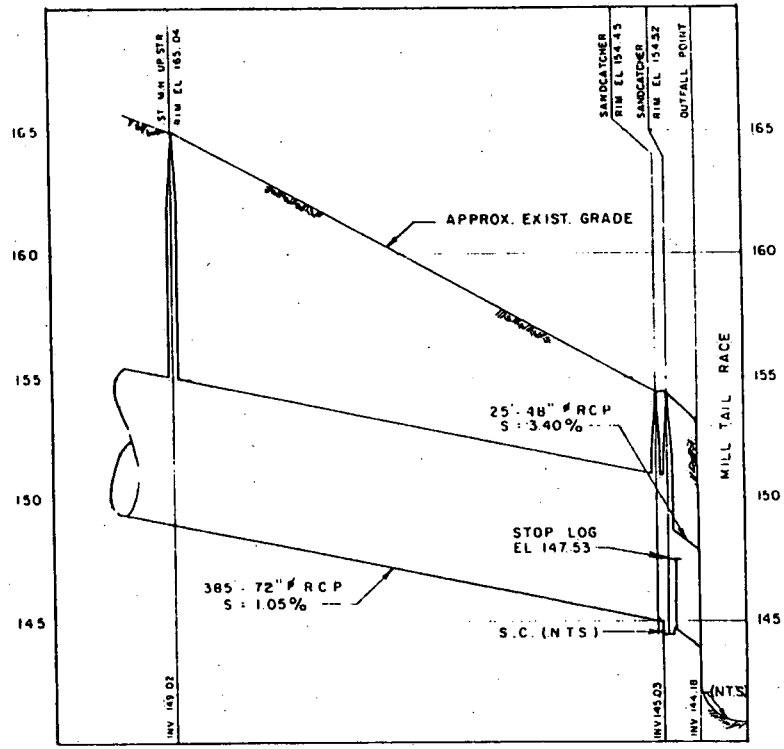
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-001

CURTIS PLACE, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

ALL ELEVATIONS BASED ON
[illegible] AS ESTABLISHED BY
[illegible] EMILIUS & ASSOCIATES
[illegible] LOCATION AND DESCRIPTION
SEE APPENDIX

KLL001610

PLATE A

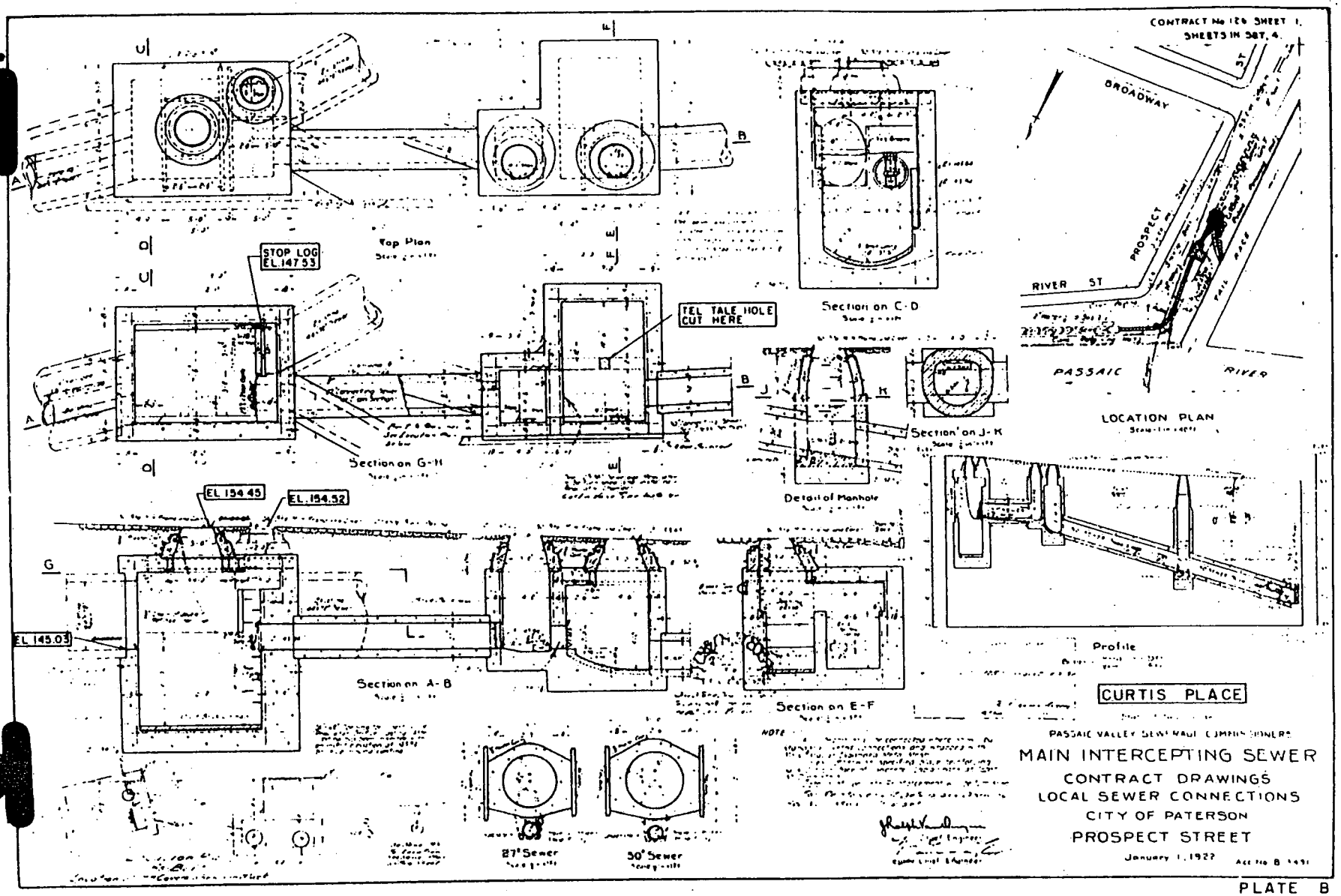
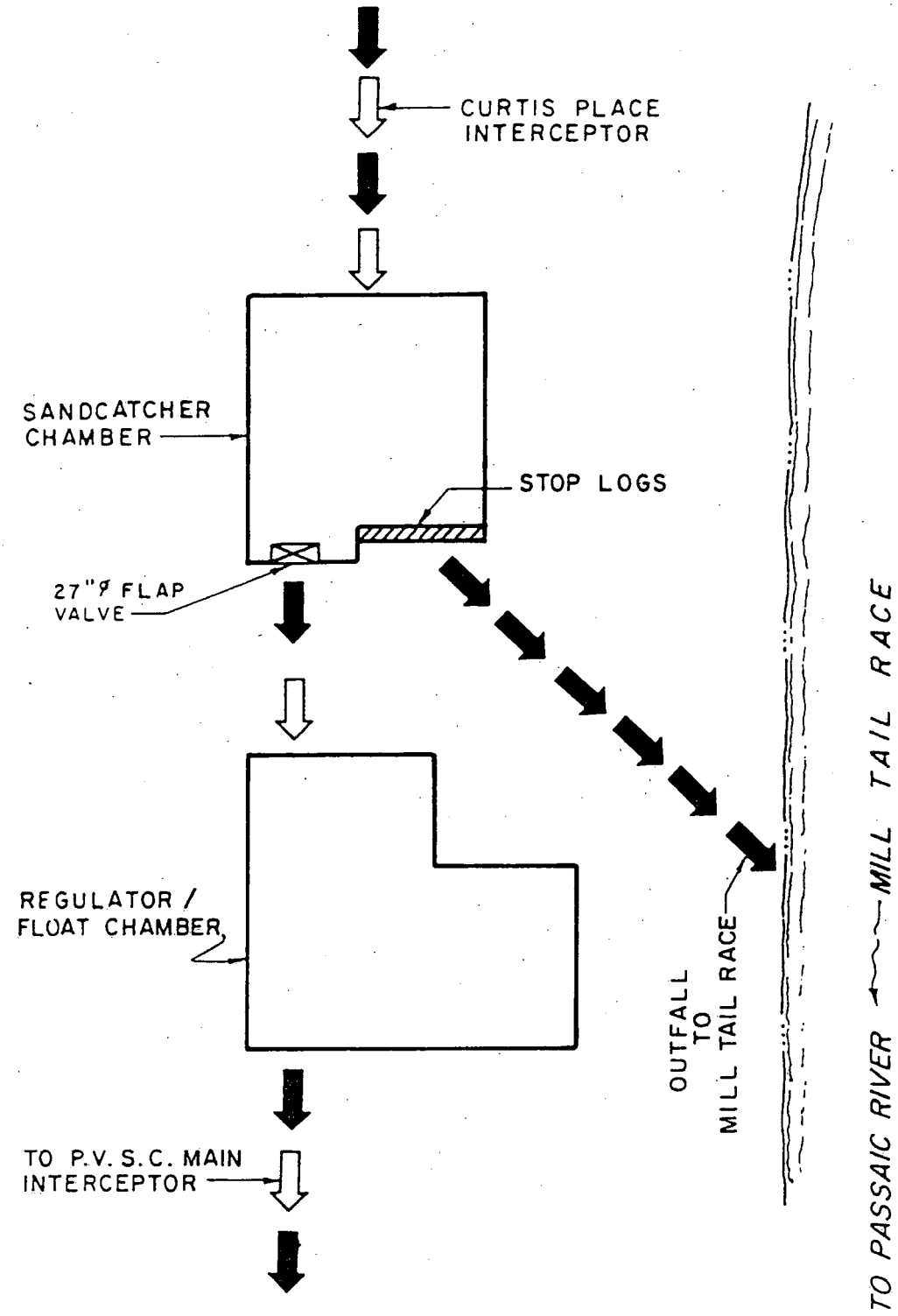


PLATE B

(3)

KLL001611



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001612

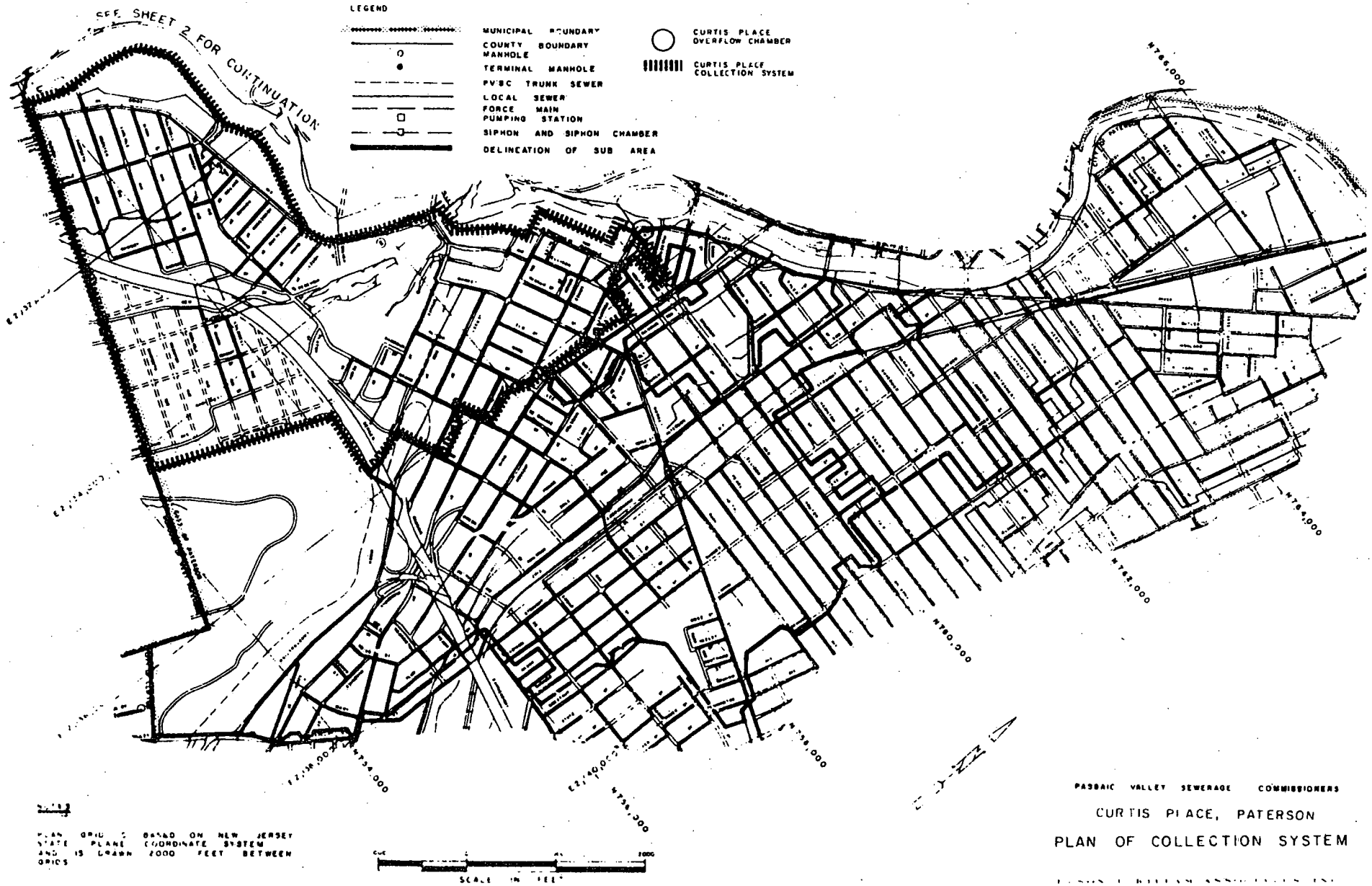
PASSAIC VALLEY SEWERAGE COMMISSIONERS

CURTIS PLACE, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers



PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS

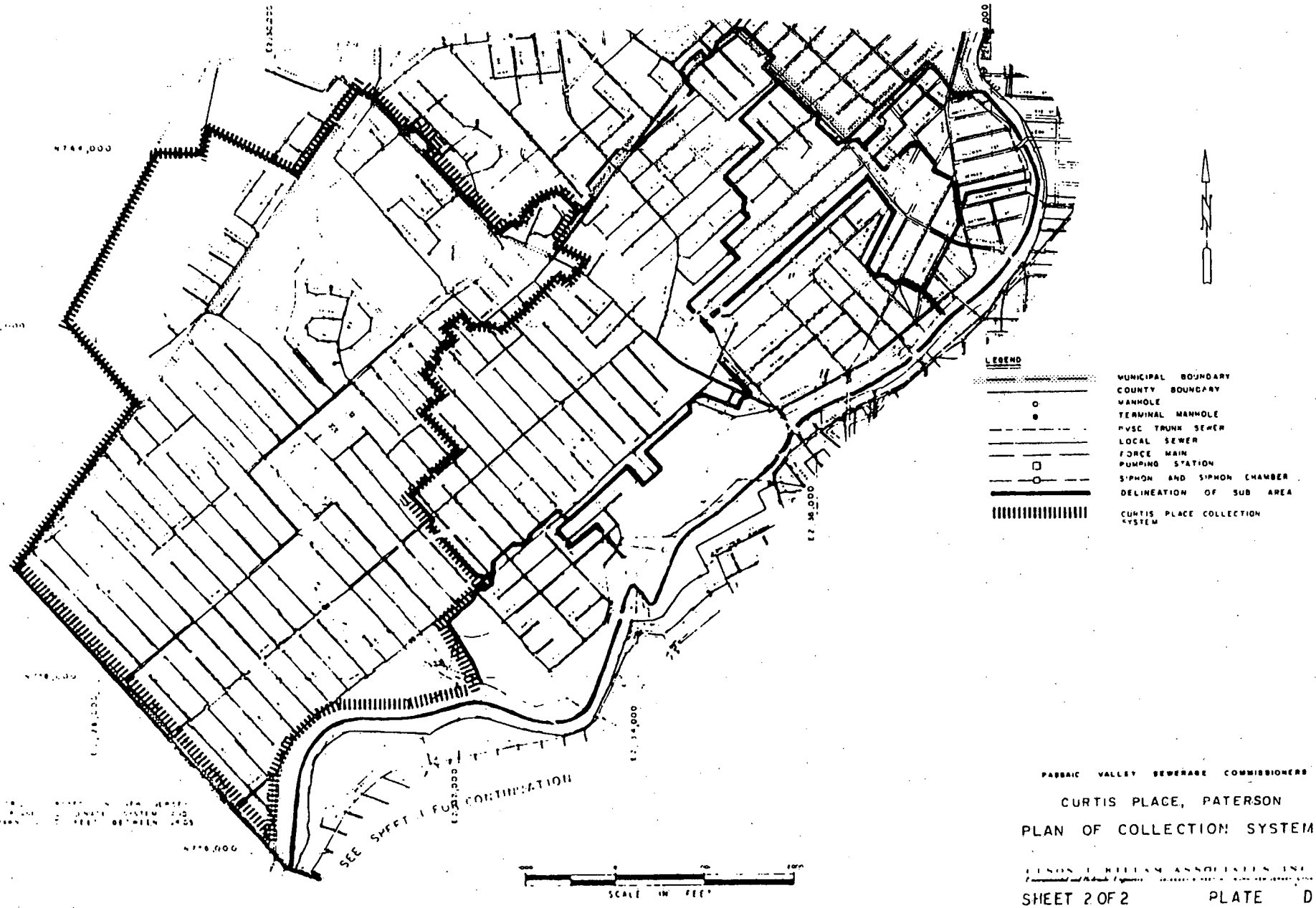
PASSAIC VALLEY SEWERAGE COMMISSIONERS

CURTIS PLACE, PATERSON

PLAN OF COLLECTION SYSTEM

SHEET 1 OF 2 PLATE D

KLL001613



PASSAIC VALLEY SEWERAGE COMMISSIONERS

CURTIS PLACE, PATERSON

PLAN OF COLLECTION SYSTEM

SHEET 2 OF 2 PLATE D

KLLC01614

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC RIVER OVERFLOWS

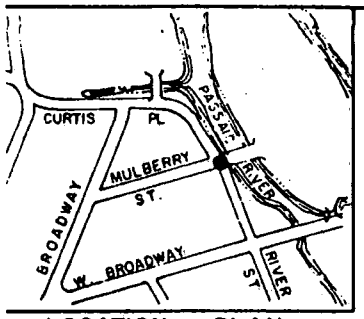
MULBERRY STREET, PATERSON

P-002

1976

ELSON T. KILLAM ASSOCIATES INC.
Environmental and Hydraulic Engineers
40 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001615



LOCATION PLAN

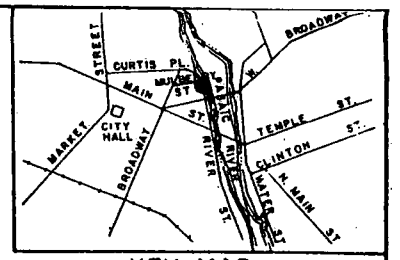
400 200 0 400

SCALE IN FEET

NOTE:
ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

LEGEND:

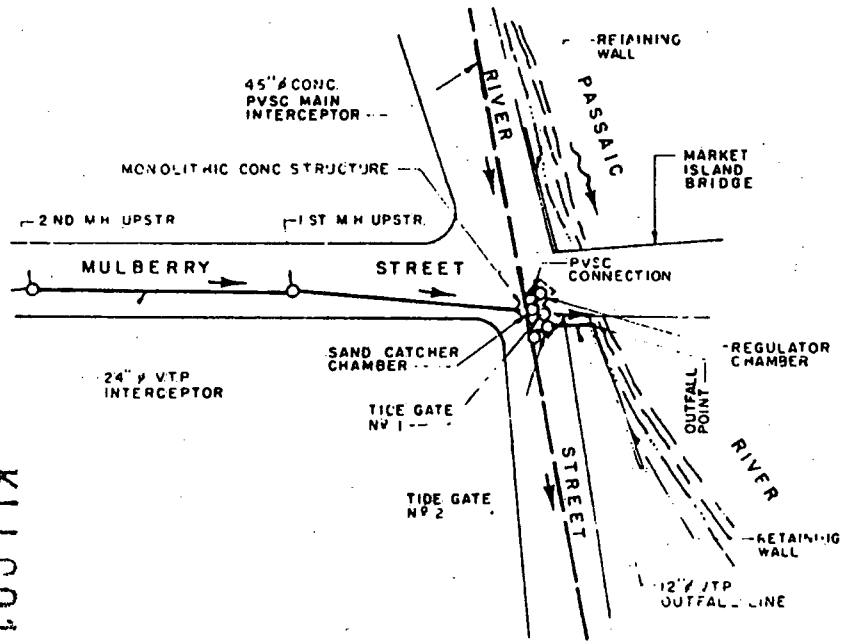
→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



KEY MAP

2000 1000 0 2000

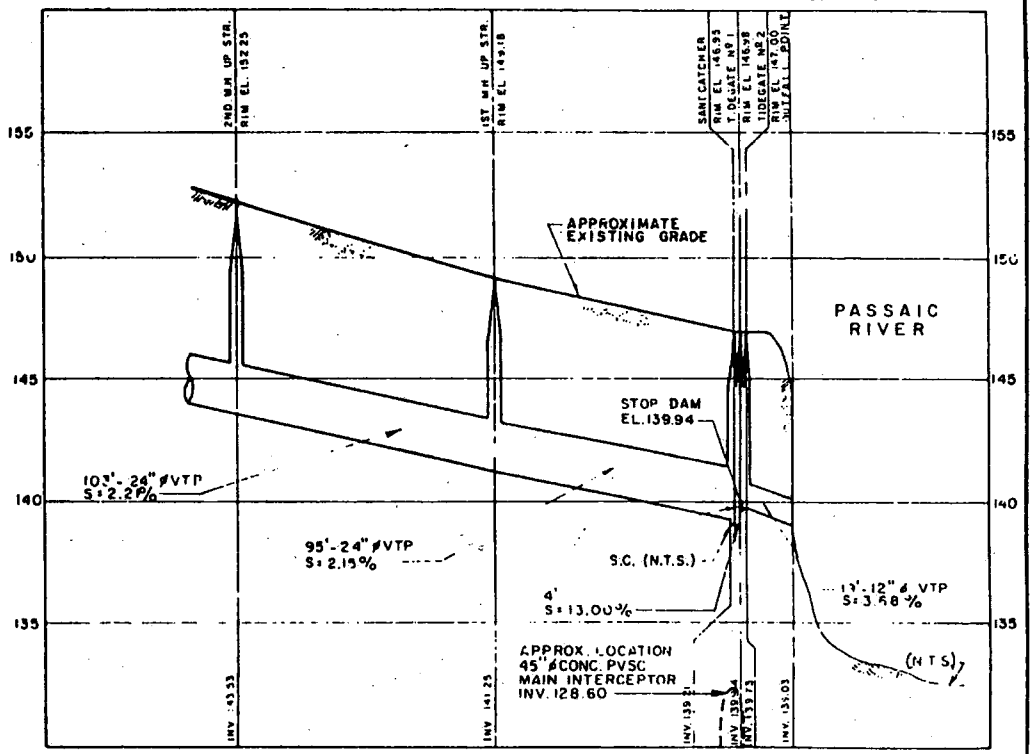
SCALE IN FEET



PLAN

50 25 0 50

SCALE IN FEET



PROFILE

HORIZONTAL 50 25 0 50 SCALE IN FEET

VERTICAL 5 4 3 2 1 0 5 SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-002

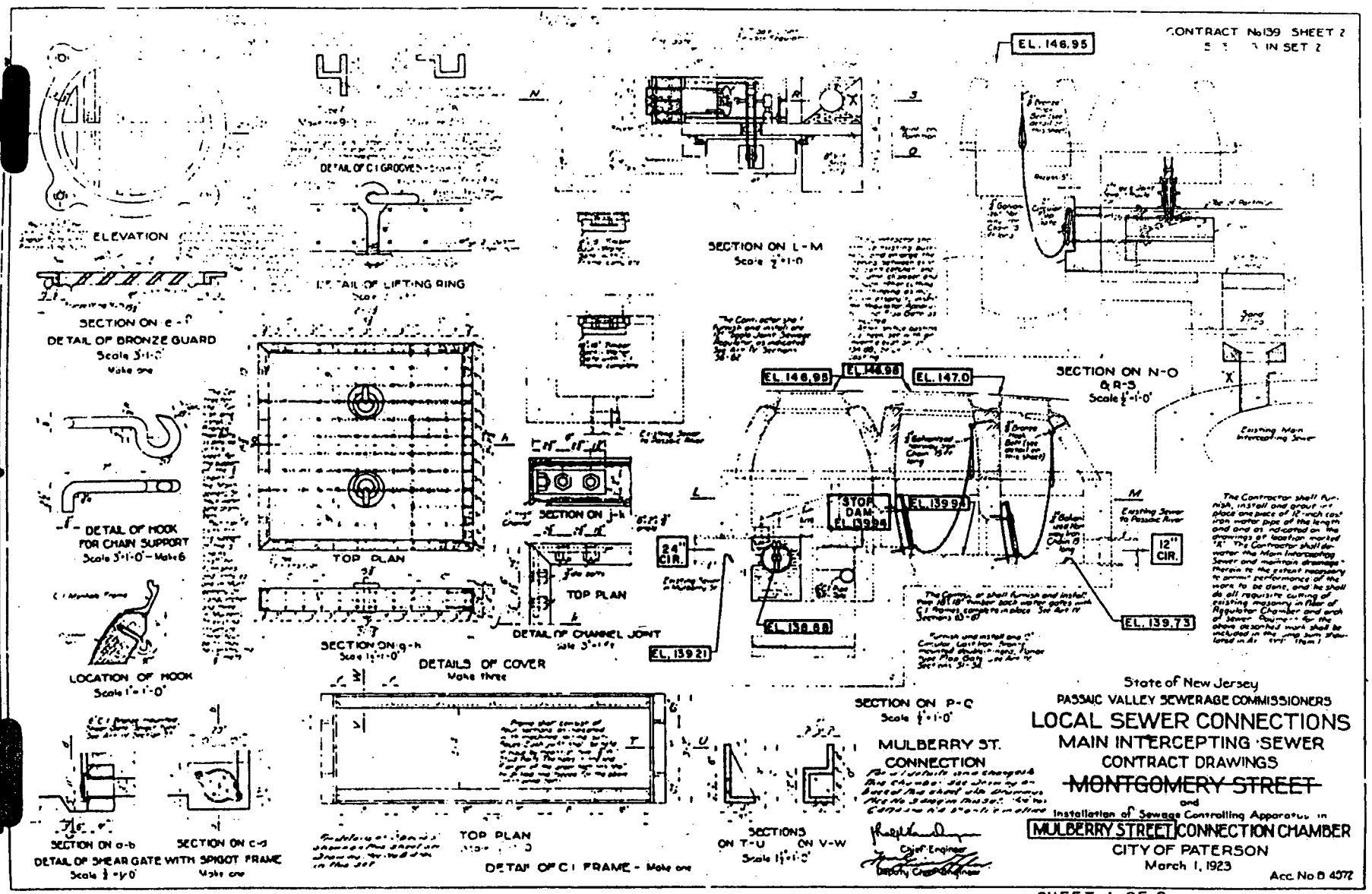
MULBERRY STREET, PATERSON

PLAN AND PROFILE

ELEVATIONS BASED ON Nº 11A AS ESTABLISHED BY H. J. EMILIUS & ASSOCIATES IN LOCATION AND DESCRIPTION OF APPENDIX

KLL001616

PLATE A



SHEET 1 OF 2

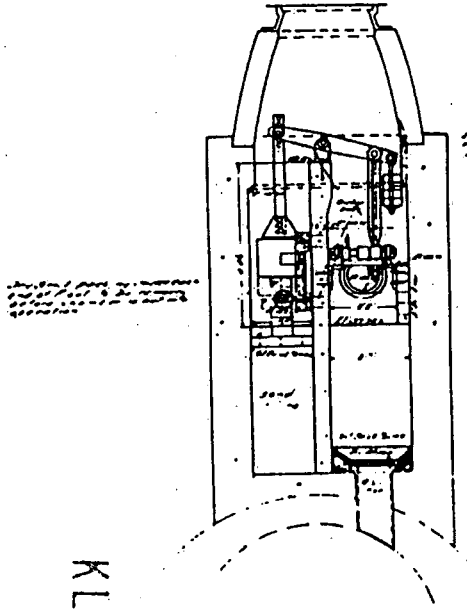
PLATE B

MULBERRY ST CONNECTION CHAMBER

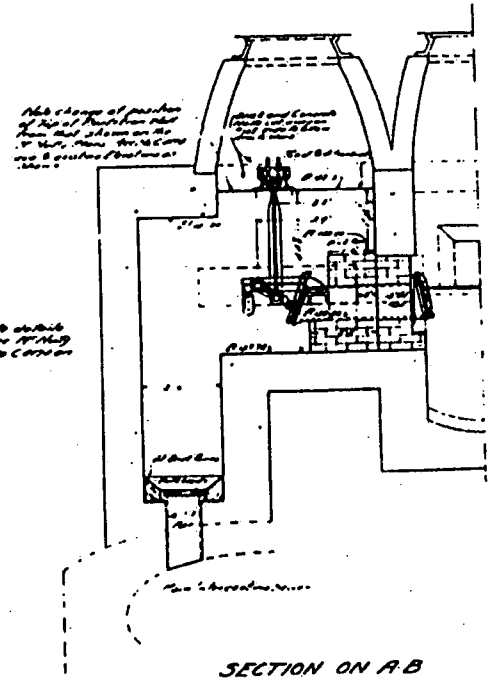
SHOWING

REGULATING APPARATUS AS INSTALLED

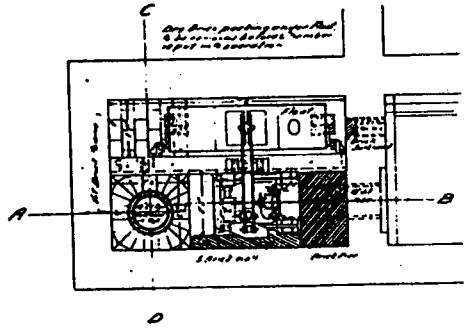
SCALE 1in=1ft



SECTION ON C-D

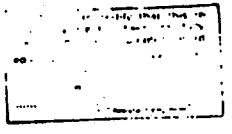


SECTION ON A-B



PLAN

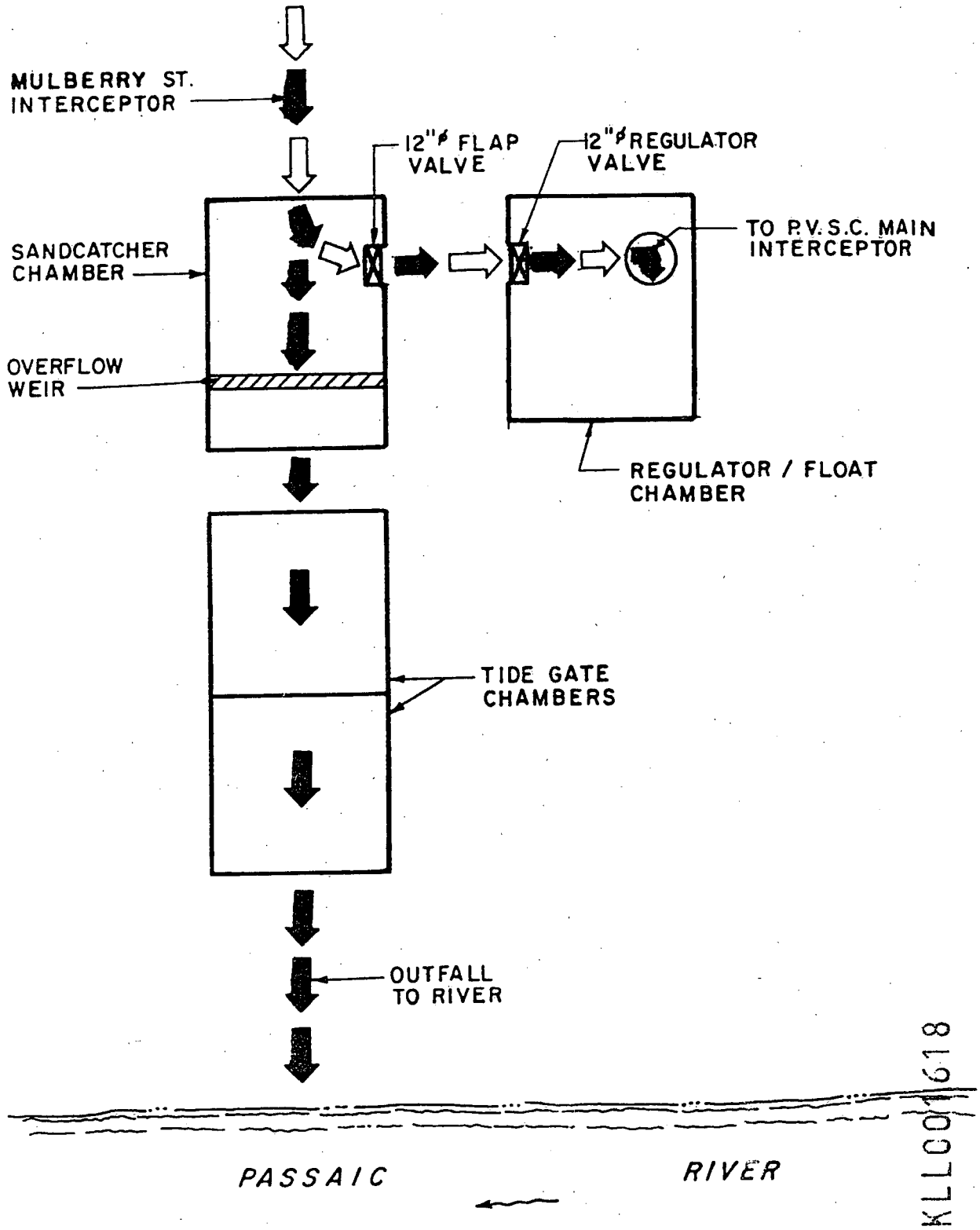
MULBERRY STREET



SHEET 2 OF 2

PLATE B

KLL001617



KLLC01618

LEGEND

DRY WEATHER FLOW

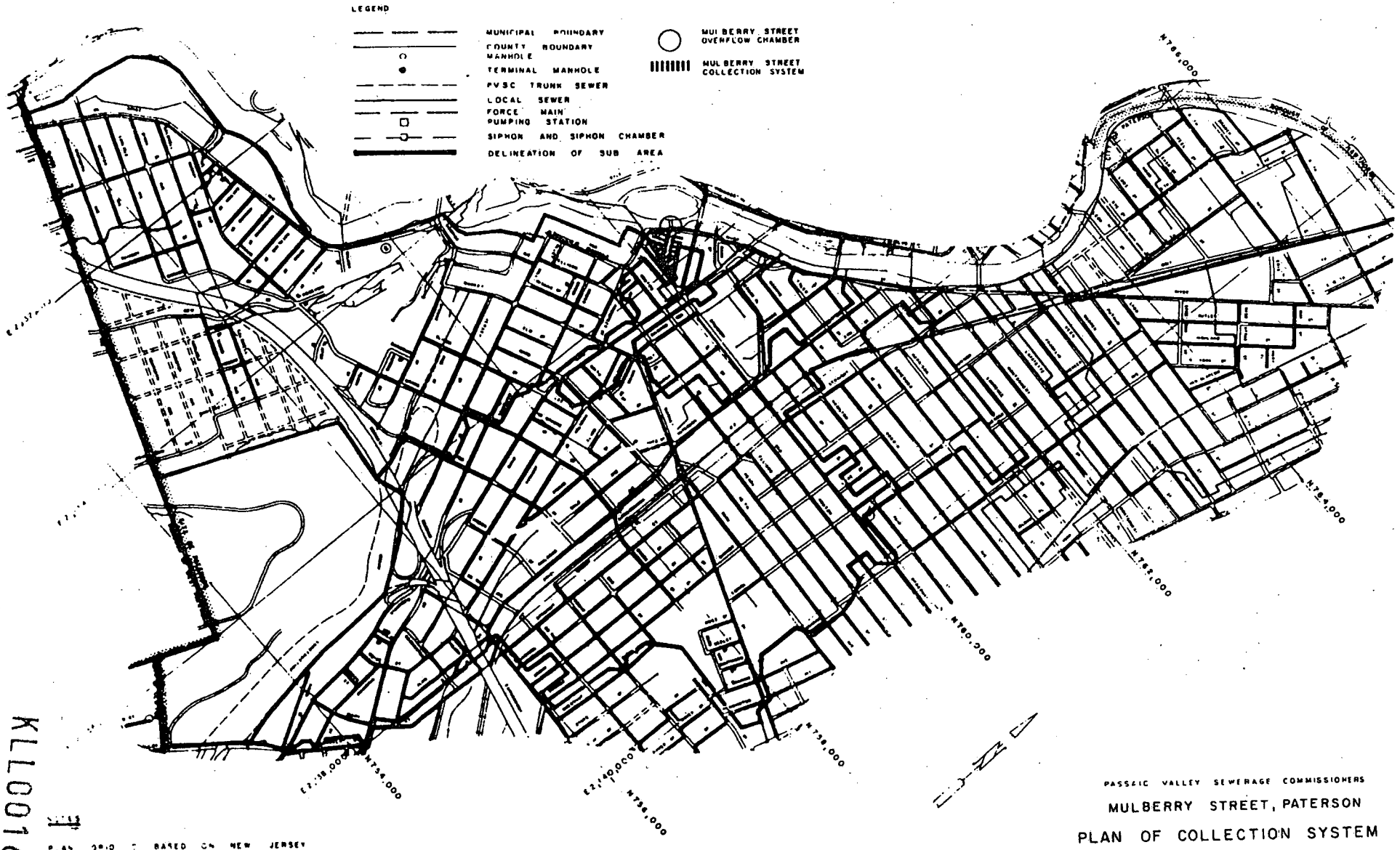
STORM FLOW/OVERFLOW

PASSAIC VALLEY SEWERAGE COMMISSIONERS

MULBERRY STREET, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers



PASSAIC VALLEY SEWERAGE COMMISSIONERS

MULBERRY STREET, PATERSON

PLAN OF COLLECTION SYSTEM

PLATE D

KLL001619

(6)

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

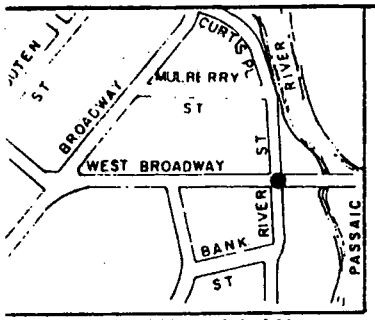
PASSAIC RIVER OVERFLOWS

WEST BROADWAY, PATERSON
P-003

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers
48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLLC01620

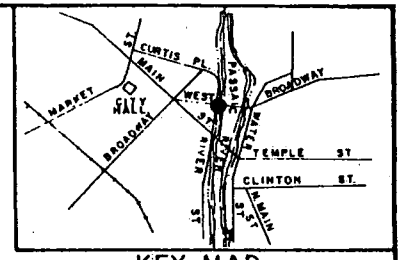


LOCATION PLAN

SCALE IN FEET

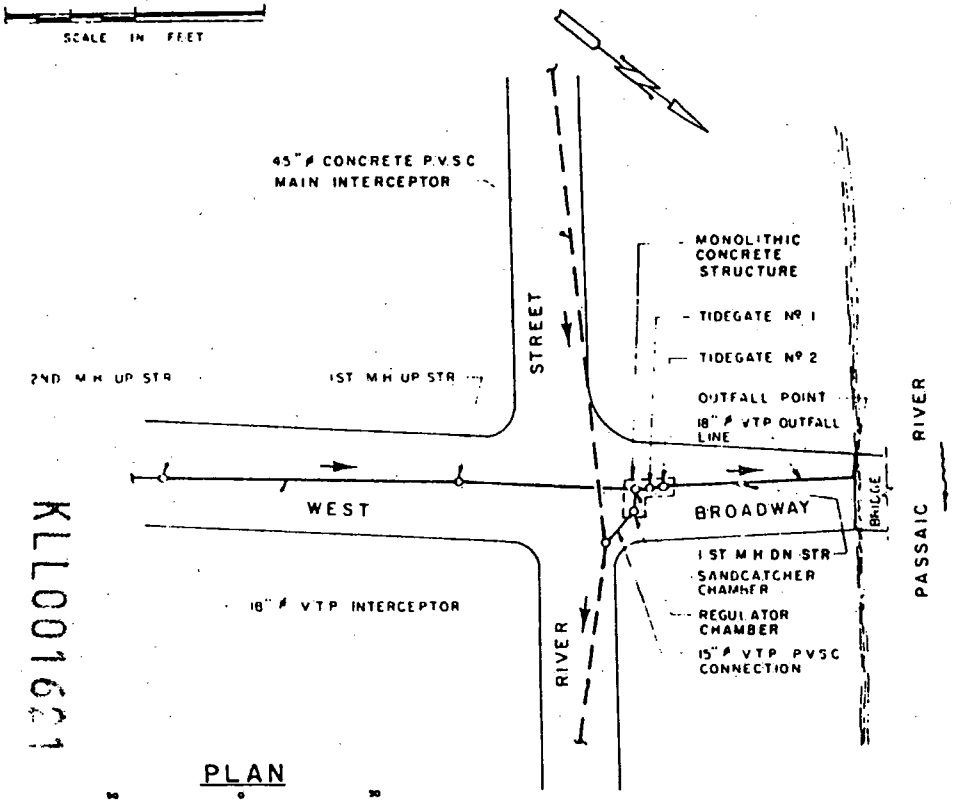
NOTE
ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

LEGEND
→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UPSTREAM
DN STR = DOWNSTREAM
N T S = NOT TO SCALE
V T P = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



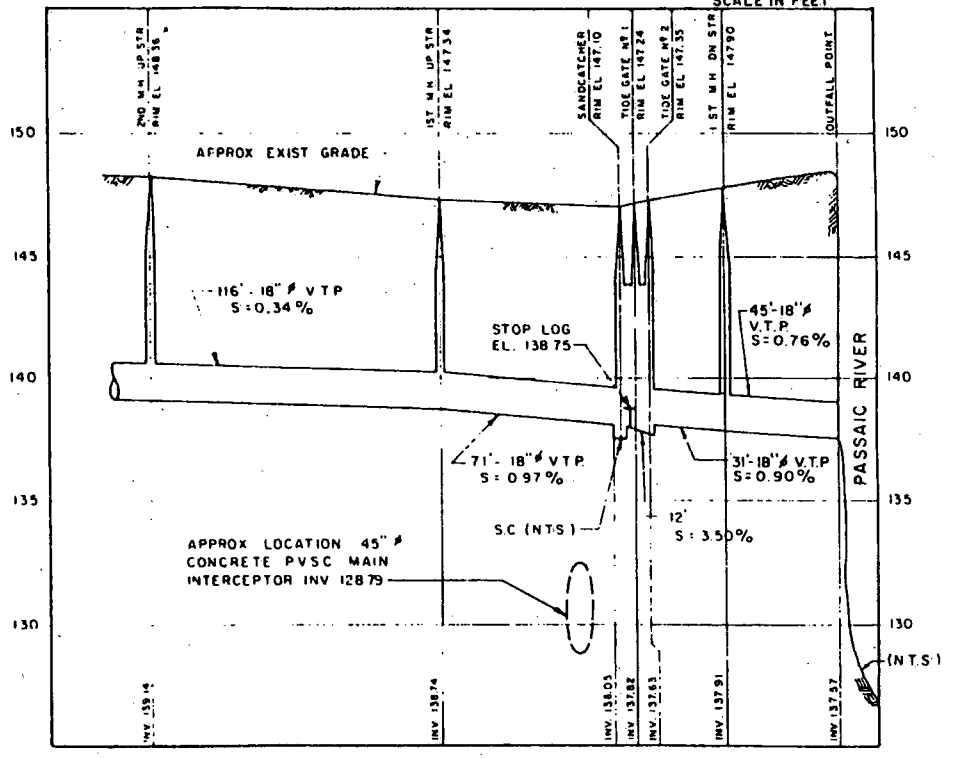
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. Nº 11A AS ESTABLISHED BY PAUL J EMILIUS & ASSOCIATES FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-003

WEST BROADWAY, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.
Environmental and Hydraulic Engineers

PLATE

KLL001621

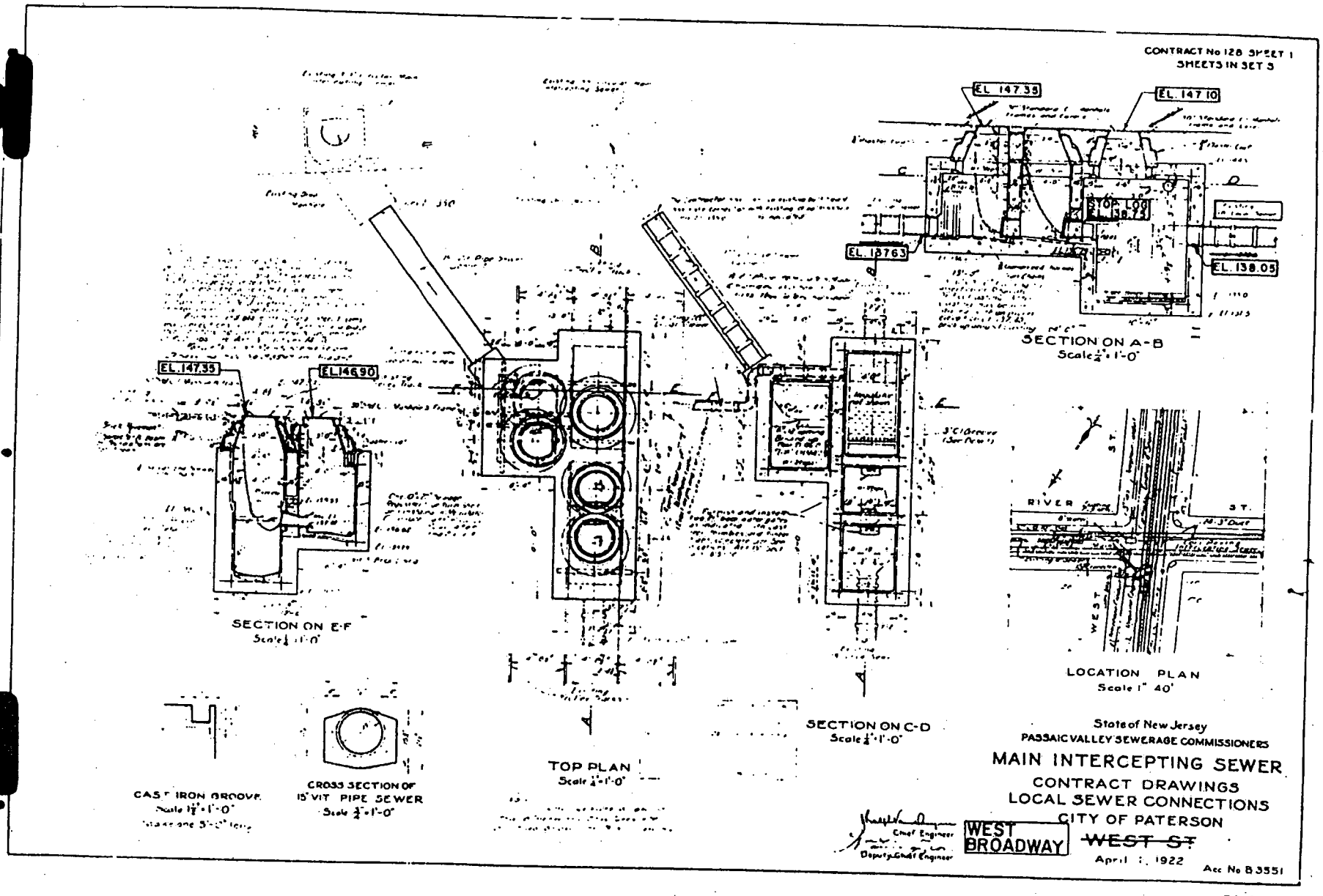
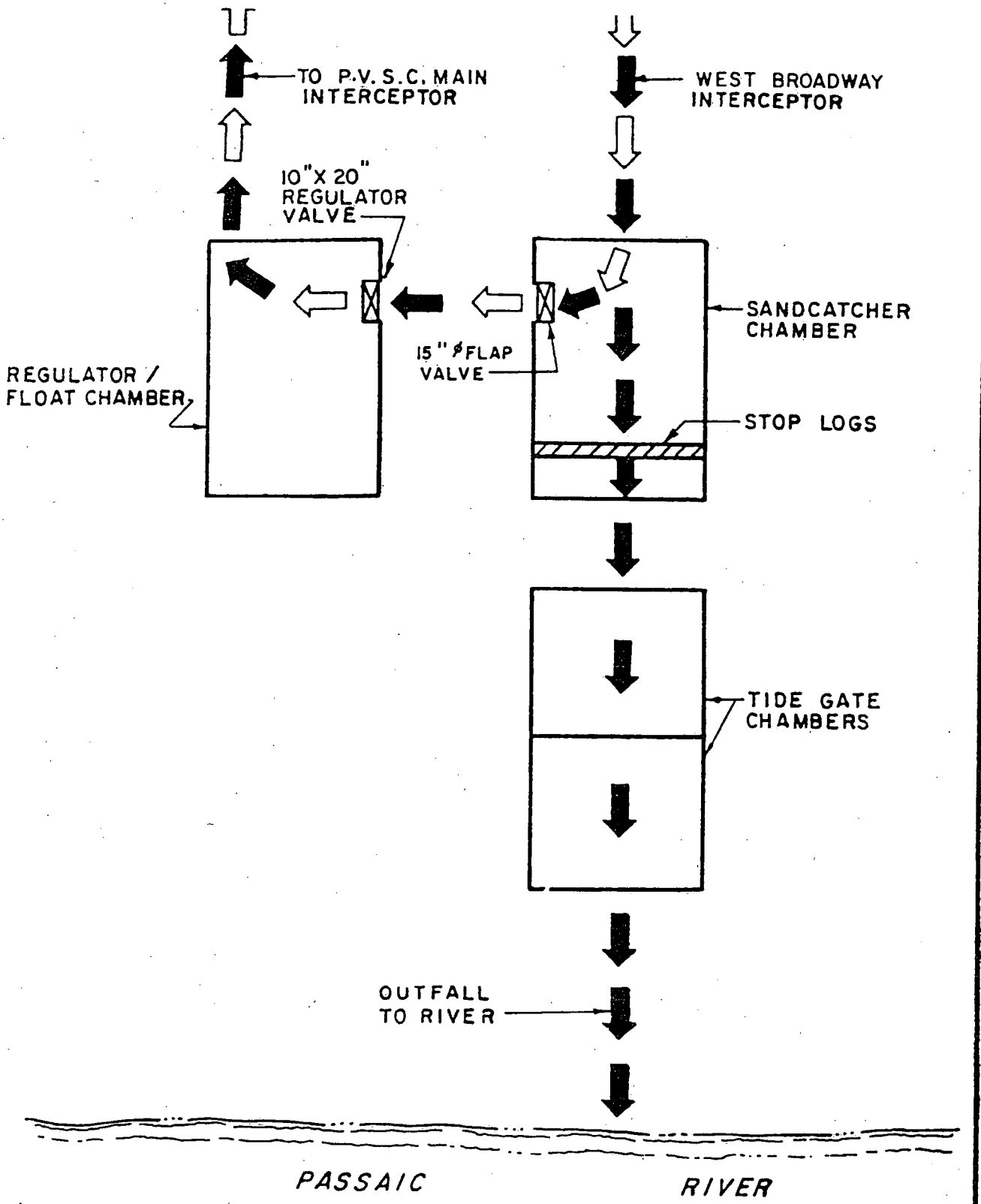


PLATE B

RL0001622



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

PASSAIC VALLEY SEWERAGE COMMISSIONERS

WEST BROADWAY, PATERSON

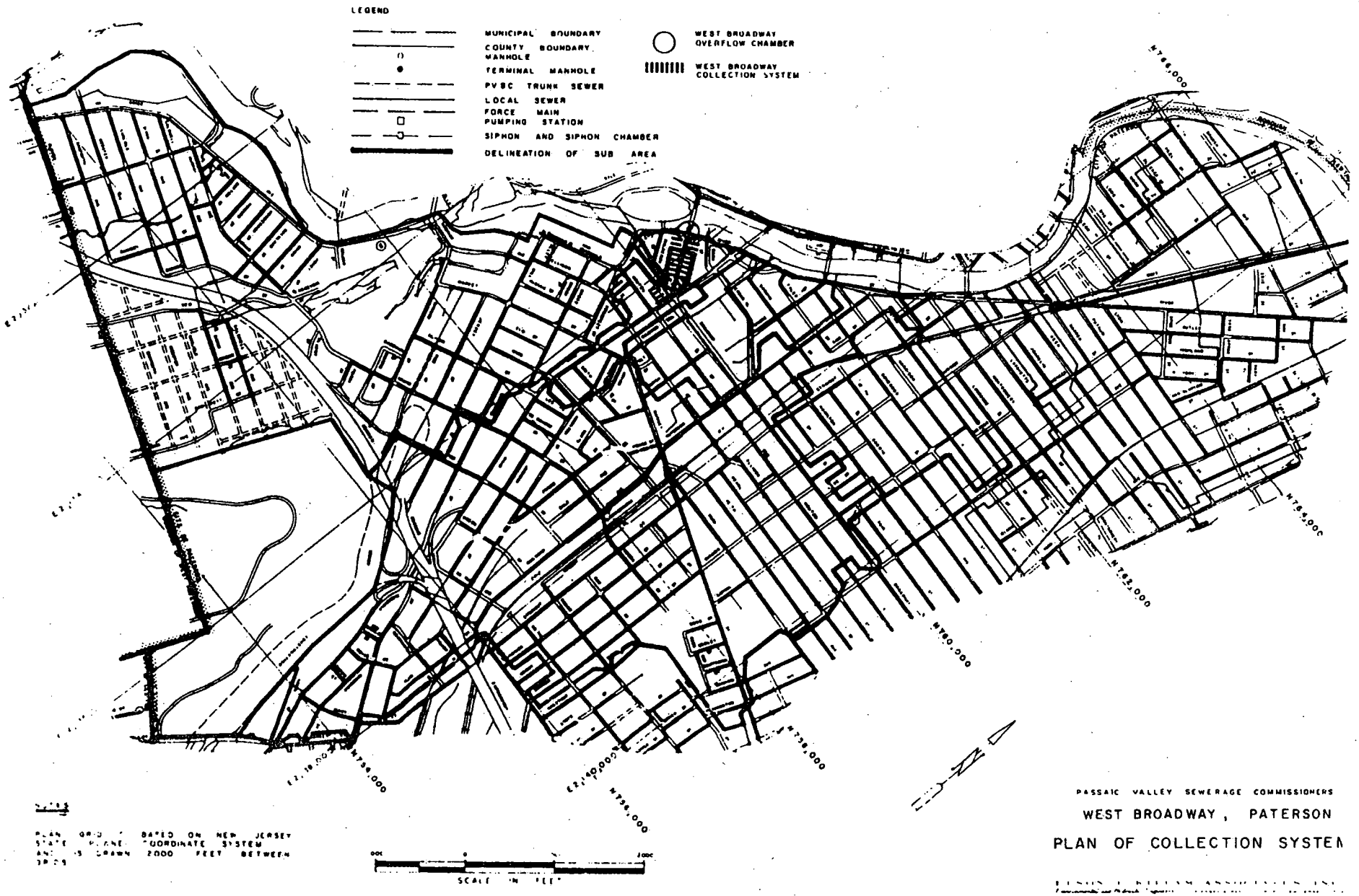
SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

KLL001623

PLATE C



PASSAIC VALLEY SEWERAGE COMMISSIONERS

WEST BROADWAY, PATERSON

PLAN OF COLLECTION SYSTEM

PLATE C

(9)

KLL001624

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

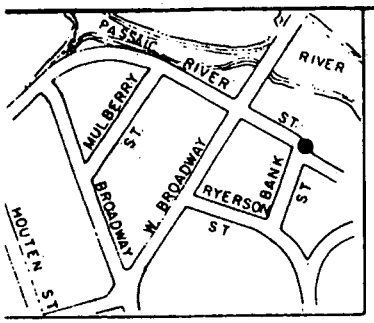
PASSAIC RIVER OVERFLOWS

BANK STREET, PATERSON
P-004

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 40 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001625



LOCATION PLAN

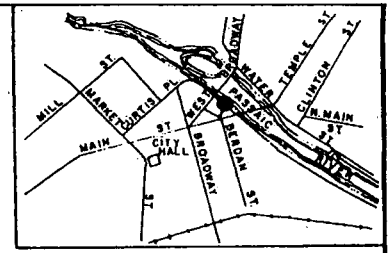
SCALE IN FEET

NOTE:

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

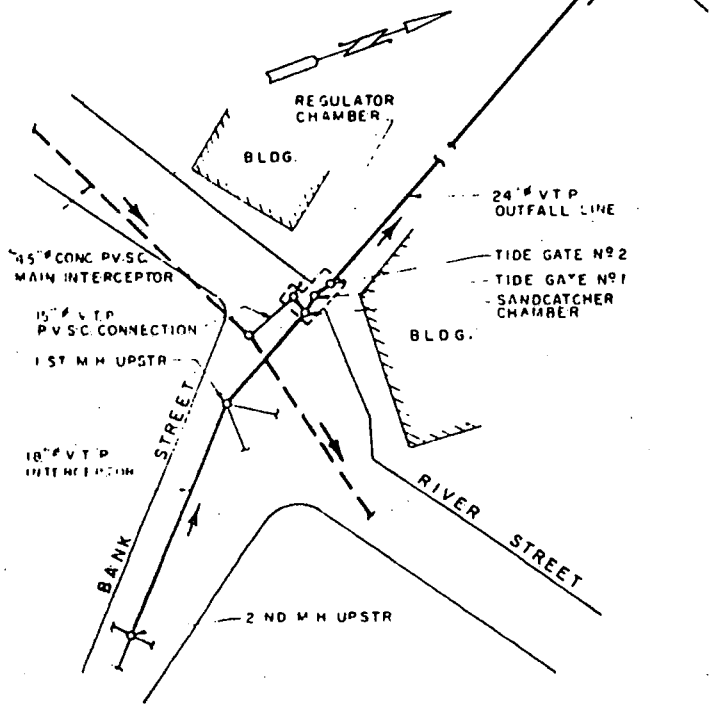
LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UPSTREAM
DN STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



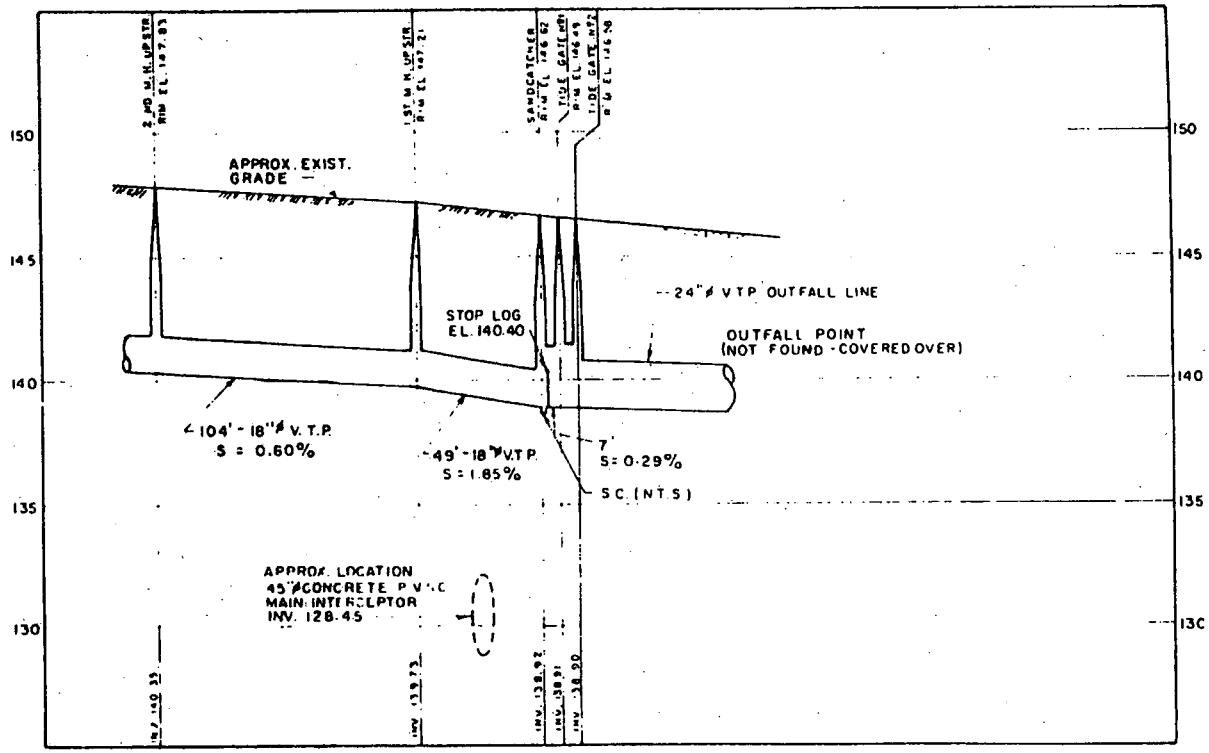
KEY MAP

SCALE IN FEET



PLAN

HORIZ. SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. Nº 114 AS ESTABLISHED BY PAUL J. EMILIUS & ASSOCIATES FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-004

BANK STREET, PATERSON

PLAN AND PROFILE

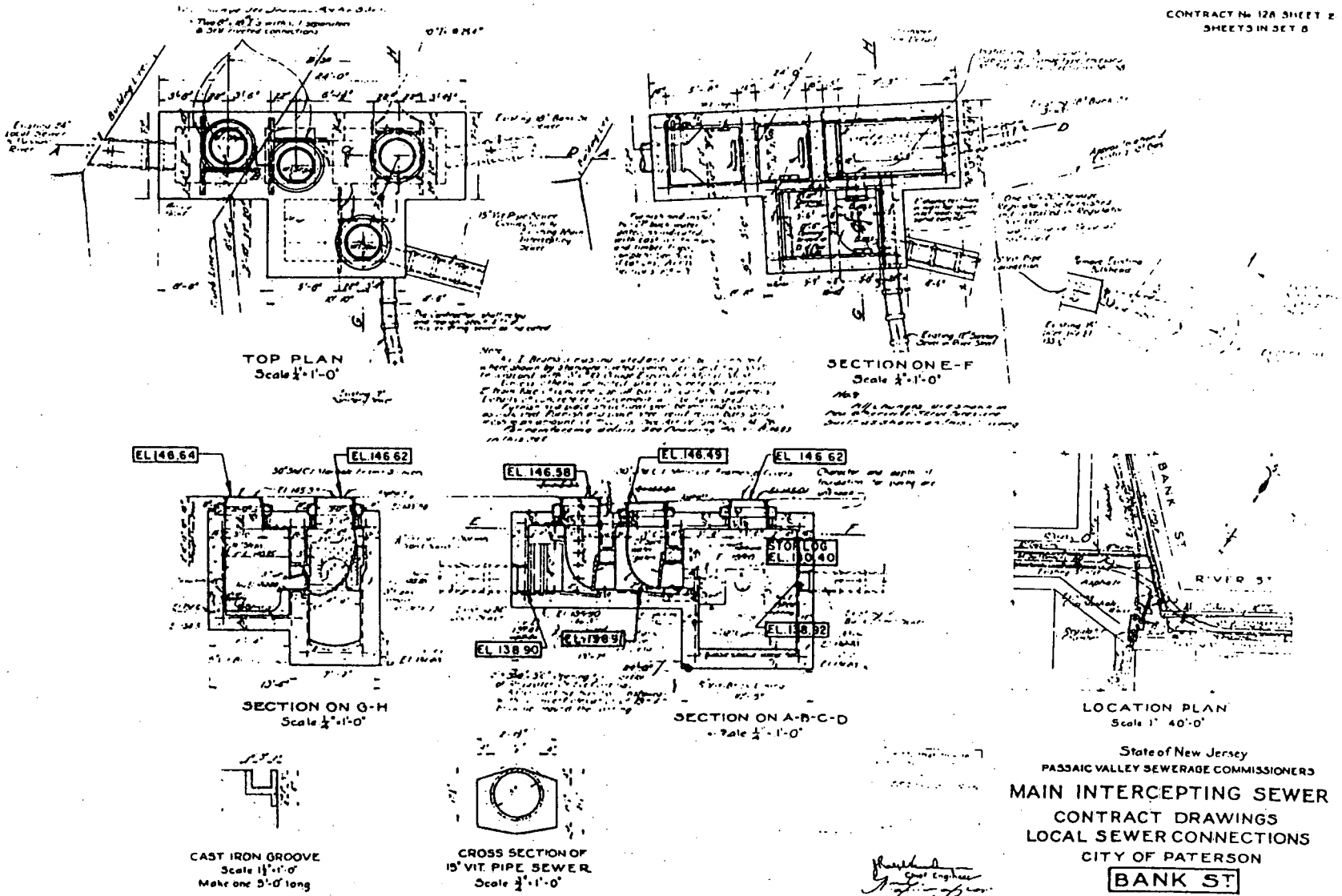
ELRON T. KILLAM ASSOCIATES INC.

Consulting and Municipal Engineers

PLATE

KLL001626

CONTRACT No 128 SHEET 2
SHEETS IN SET 8



State of New Jersey
PASSAIC VALLEY SEWERAGE COMMISSIONERS

MAIN INTERCEPTING SEWER

CONTRACT DRAWINGS
LOCAL SEWER CONNECTIONS
CITY OF PATERSON

BANK ST

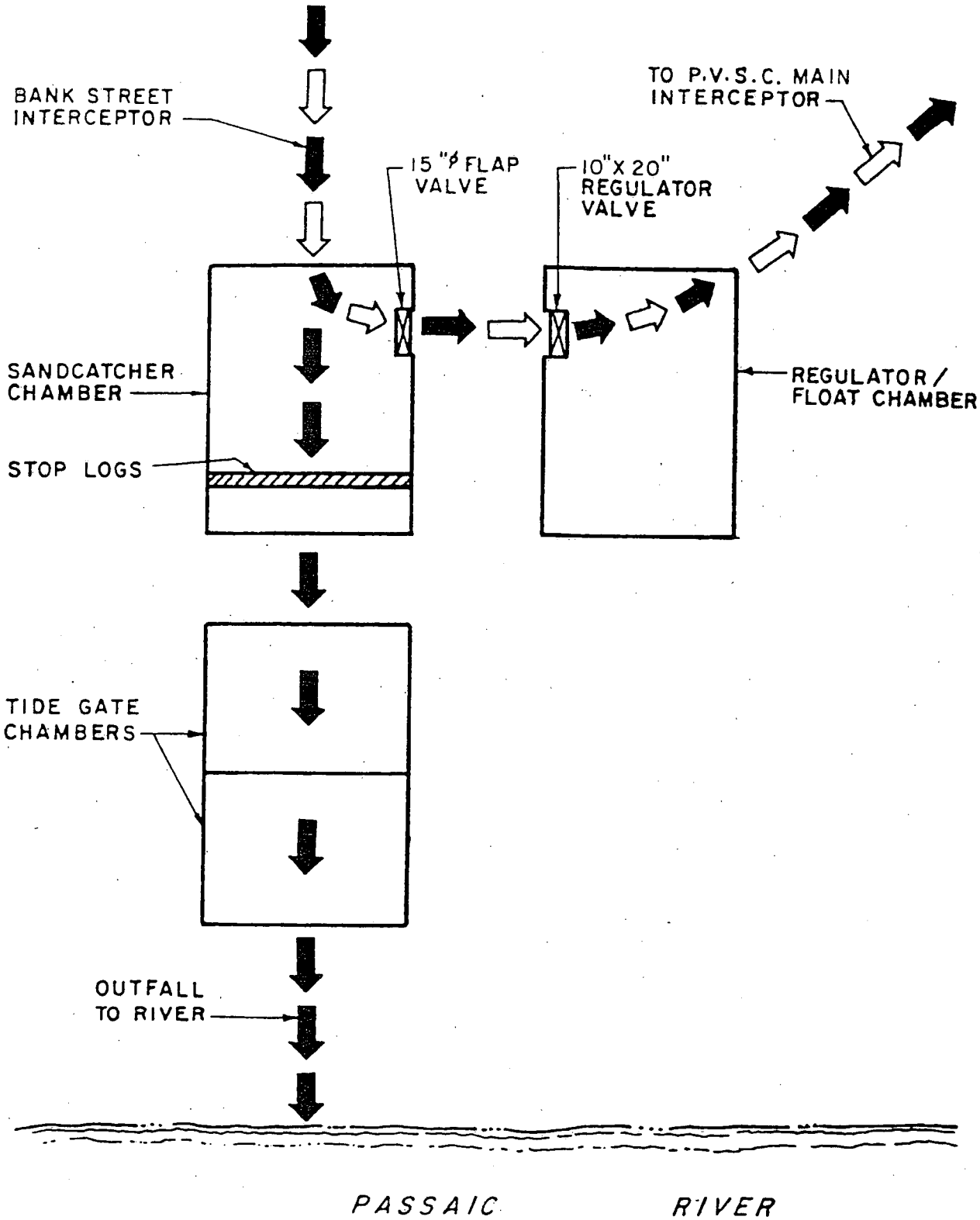
April 1, 1922.

Acc No B 3552

PLATE B

(3)

KLL001627



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001628

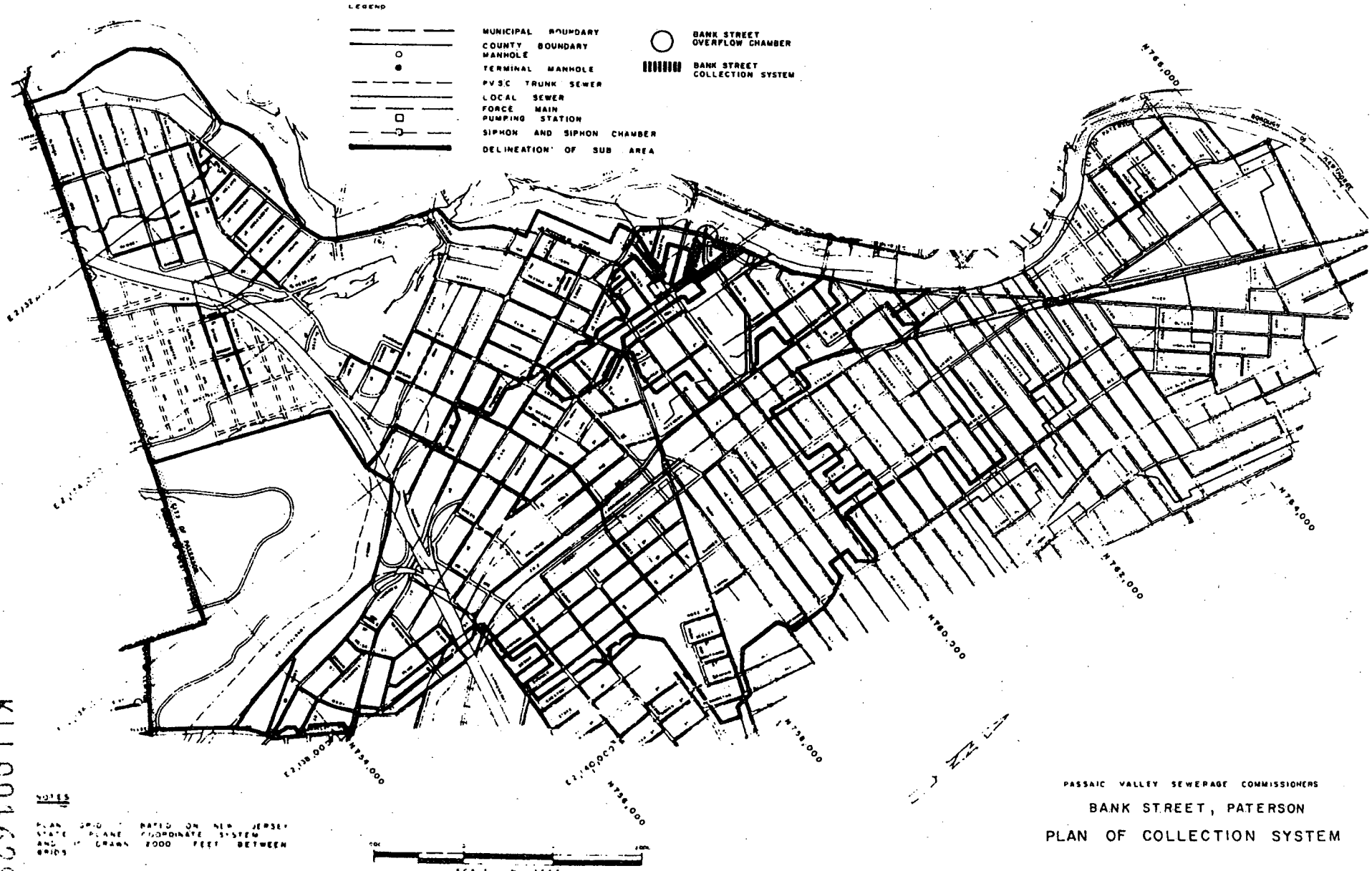
PASSAIC VALLEY SEWERAGE COMMISSIONERS

BANK STREET, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE C



PASSAIC VALLEY SEWERAGE COMMISSIONERS

BANK STREET, PATERSON

PLAN OF COLLECTION SYSTEM

PLATE D

KLL001629

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

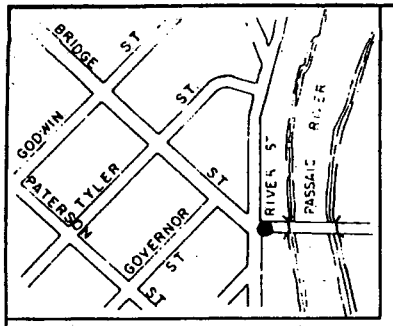
PASSAIC RIVER OVERFLOWS

BRIDGE STREET, PATERSON
P-005

1976

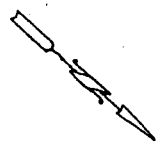
ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 40 ESSEX STREET MILLBURN NEW JERSEY 07041

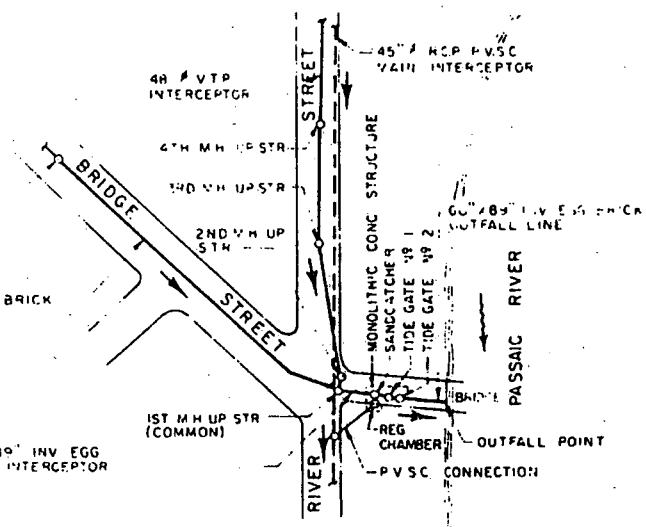
KLL001630



LOCATION PLAN

SCALE IN FEET





PLAN

SCALE IN FEET

KEL001631

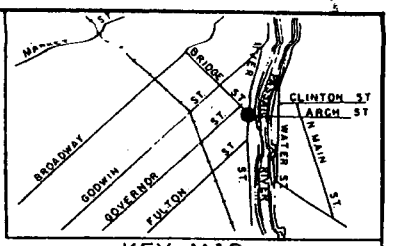
ALL ELEVATIONS BASED ON RM NF 6A AS ESTABLISHED BY PAUL J. EMILIUS & ASSOCIATES FOR LOCATION AND DESCRIPTION SEE APPENDIX

NOTE

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

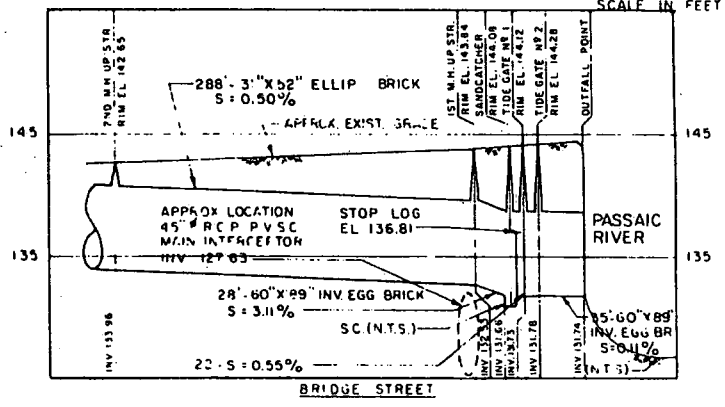
LEGEND:

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
NTS = NOT TO SCALE
R.C.P. = REINFORCED CONCRETE PIPE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION

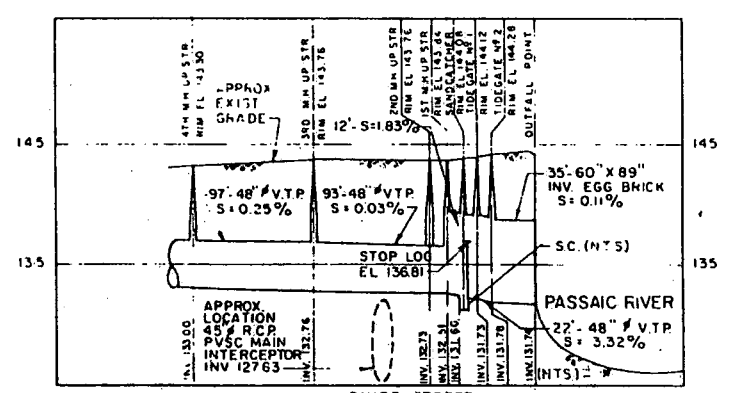


KEY MAP

SCALE IN FEET



BRIDGE STREET



RIVER STREET

PROFILES

SCALE IN FEET

SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-005

BRIDGE STREET, PATERSON

PLAN AND PROFILES

ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

PLATE

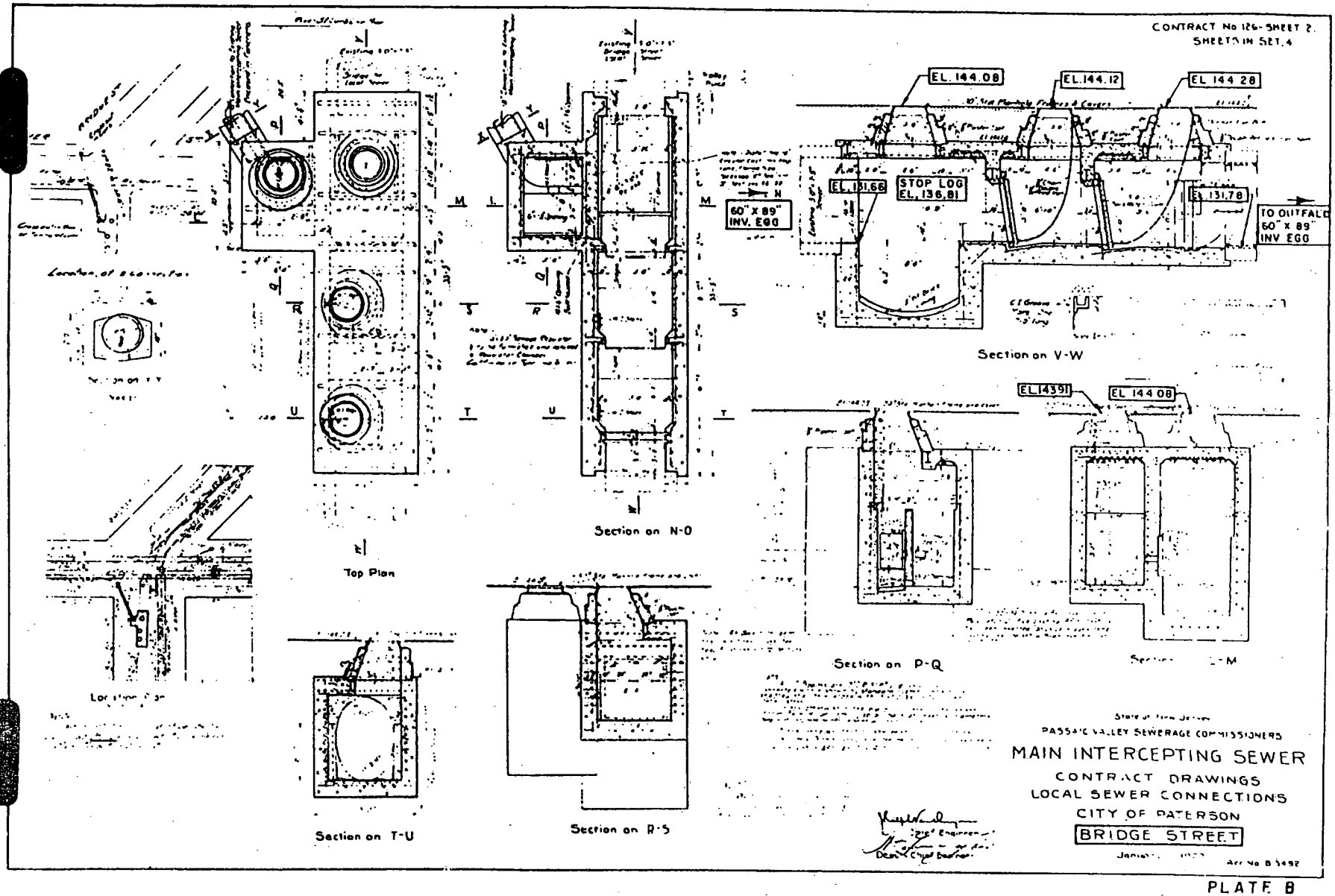
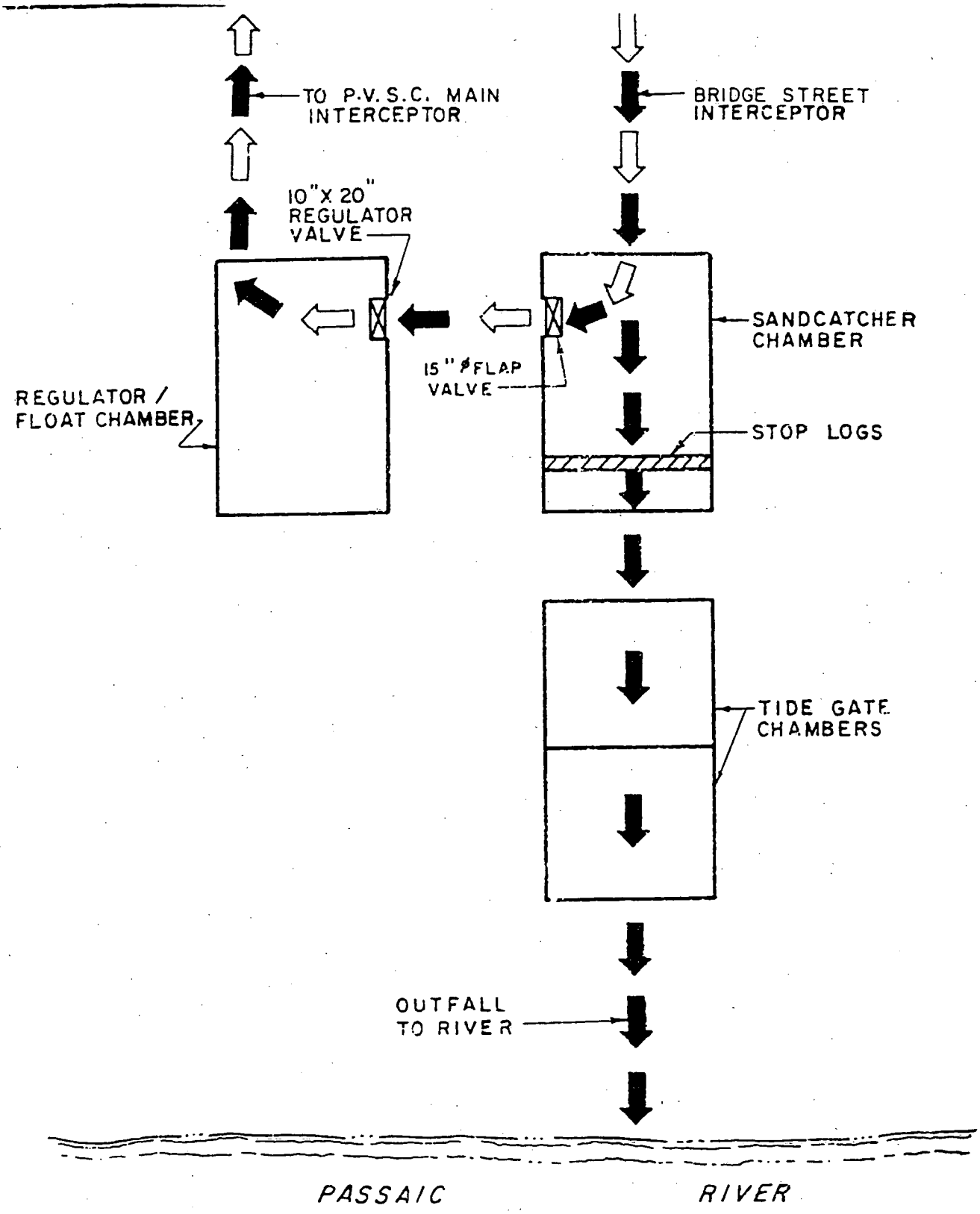


PLATE 8

(3)

KLL0016 32



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001633

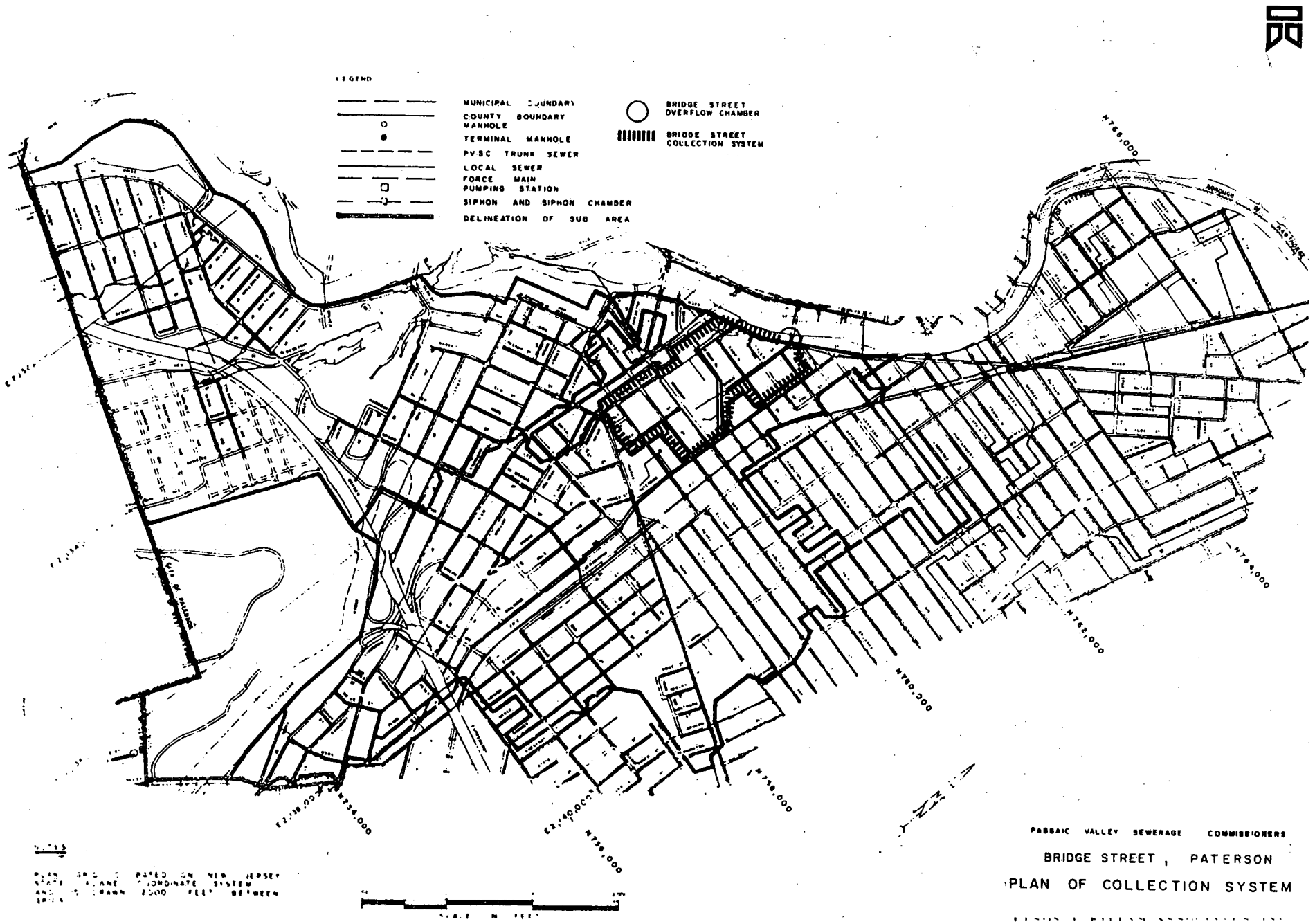
PASSAIC VALLEY SEWERAGE COMMISSIONERS

BRIDGE STREET, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC.

PLATE C



PASSAIC VALLEY SEWERAGE COMMISSIONERS

BRIDGE STREET, PATERSON

PLAN OF COLLECTION SYSTEM

PLATE D

KLL001634

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

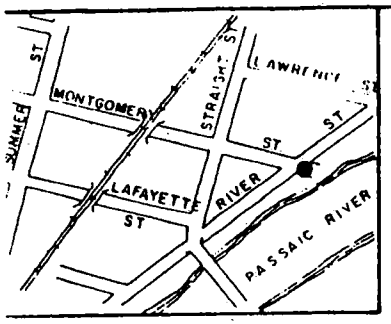
PASSAIC RIVER OVERFLOWS

MONTGOMERY STREET, PATERSON
P-006

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001635



LOCATION PLAN

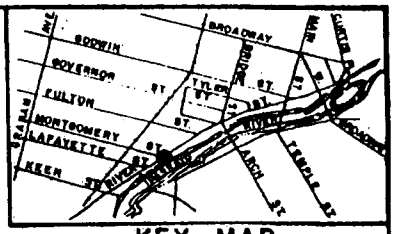
SCALE IN FEET

NOTE

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

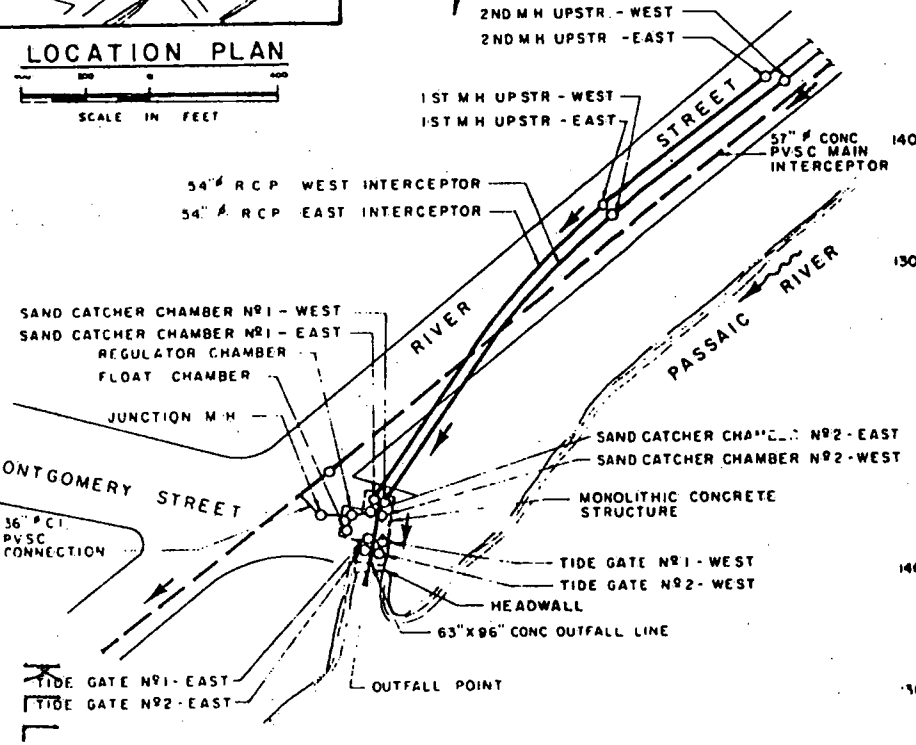
LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
N.T.S. = NOT TO SCALE
C.I. = CAST IRON
R.C.P. = REINFORCED CONCRETE PIPE
● = OVERFLOW LOCATION



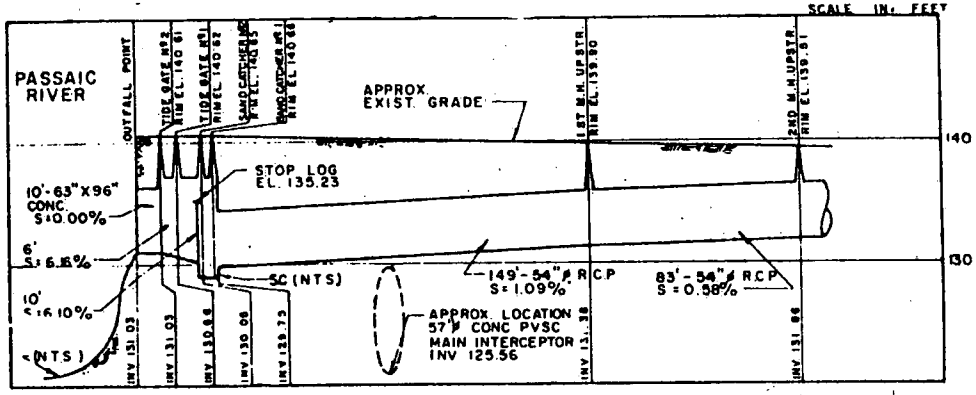
KEY MAP

SCALE IN FEET

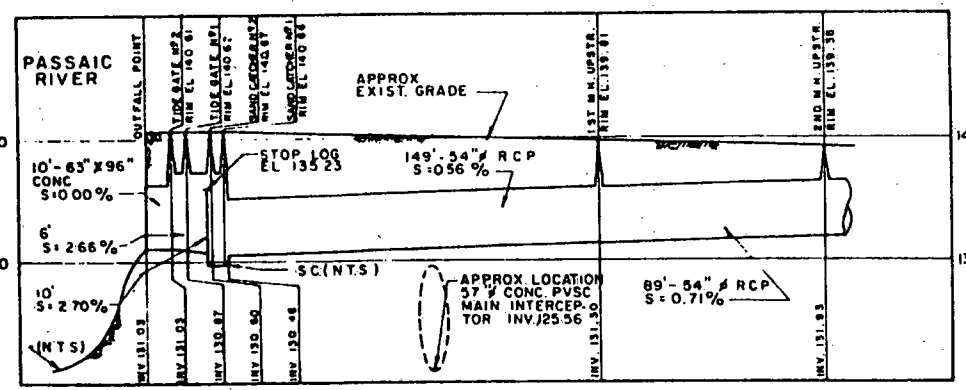


PLAN

SCALE IN FEET



EAST INTERCEPTOR



WEST INTERCEPTOR

PROFILES

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON [illegible] AS PUBLISHED BY [illegible]
FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-006

MONTGOMERY STREET, PATERSON

PLAN AND PROFILES

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE A

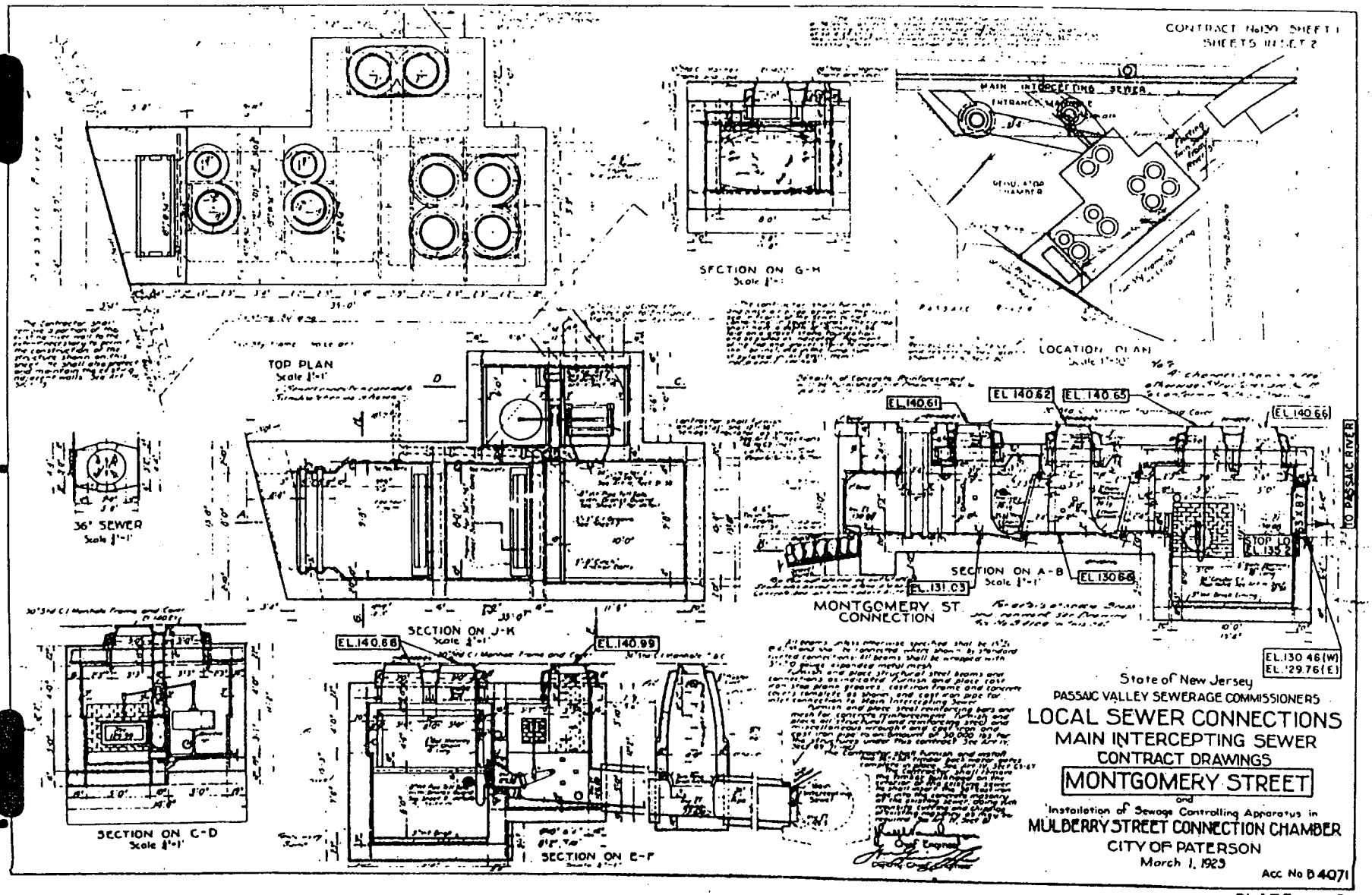
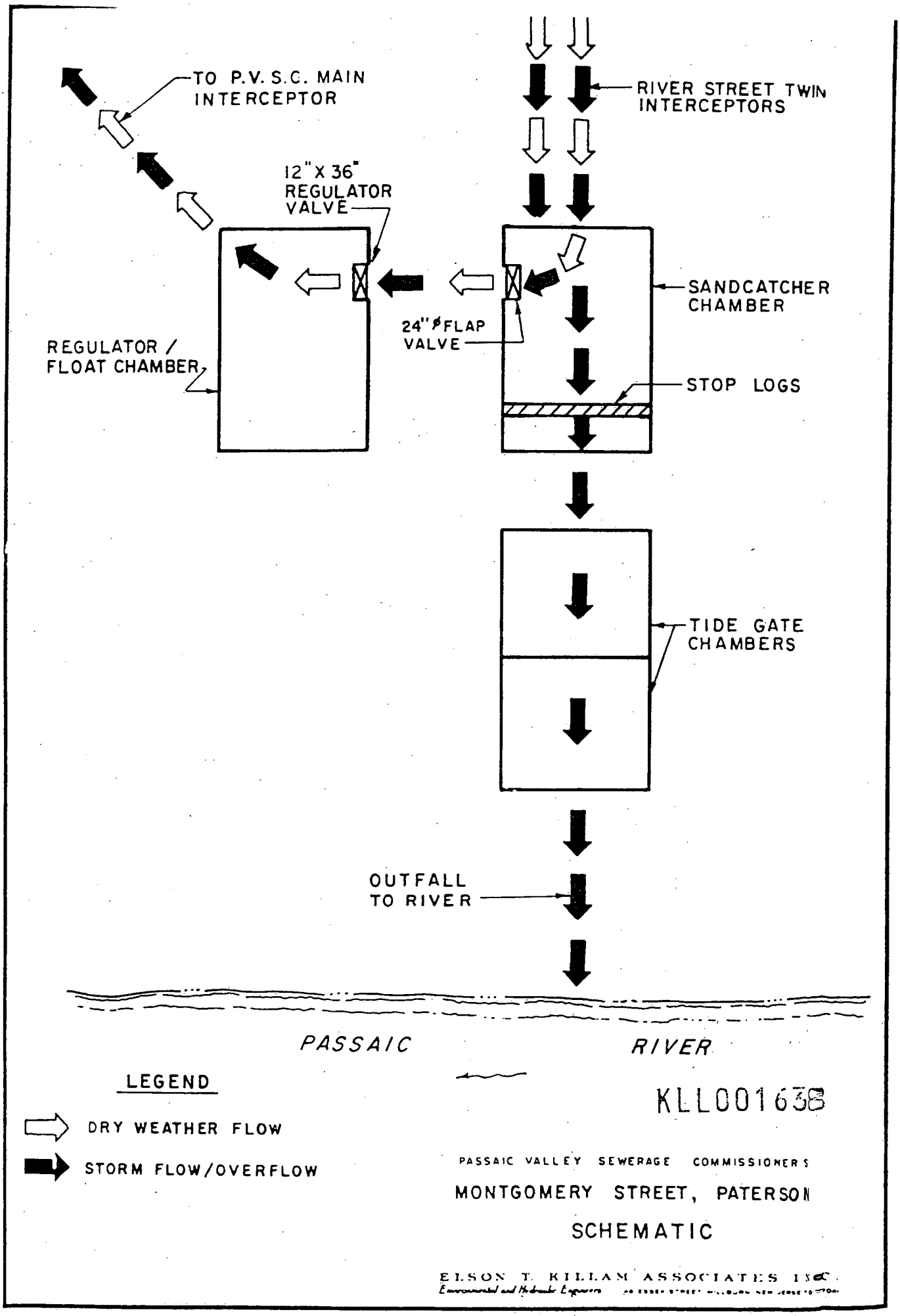


PLATE B

(3)

KLL001617



KLL00163B

PASSAIC VALLEY SEWERAGE COMMISSIONERS

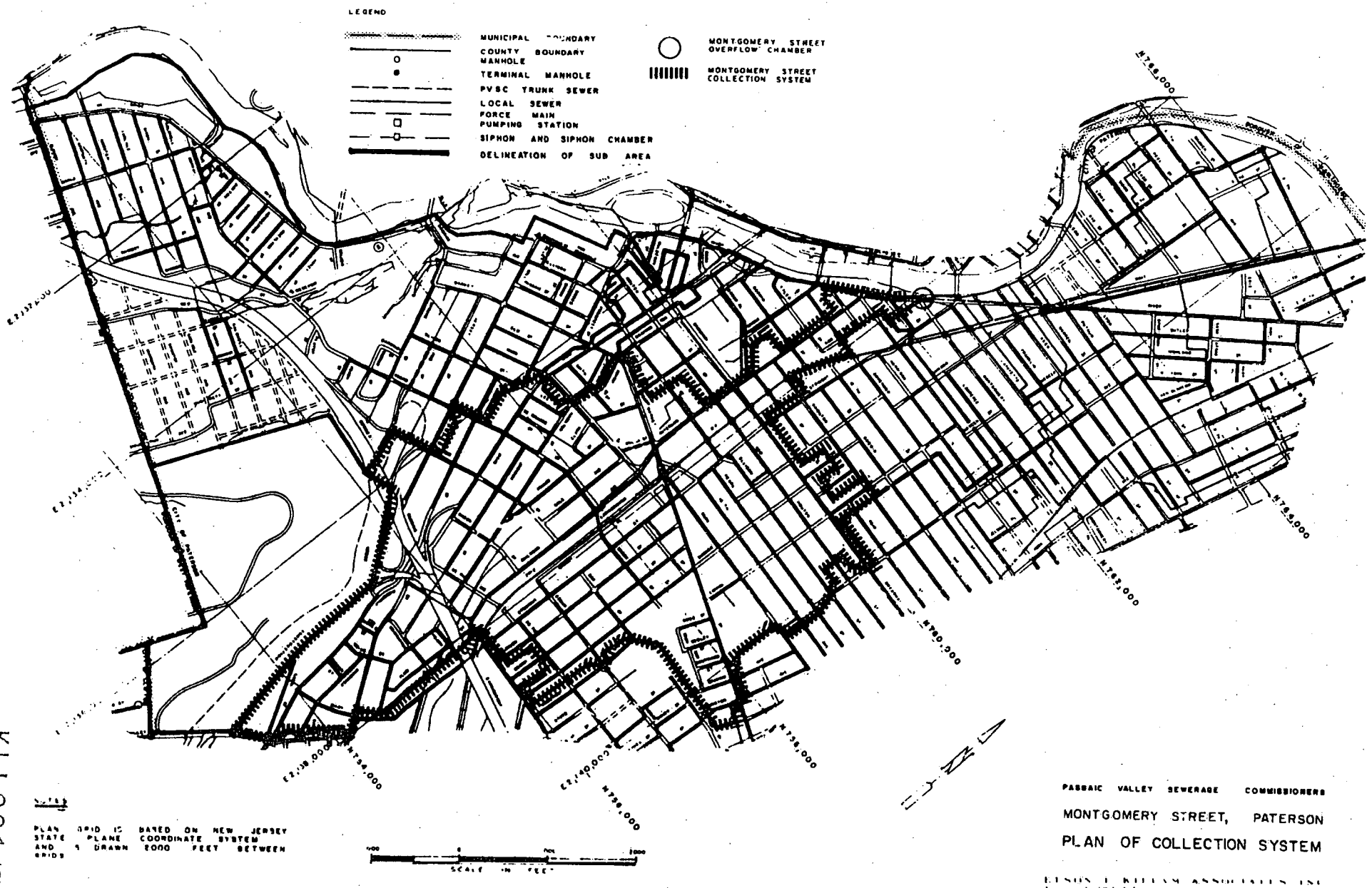
MONTGOMERY STREET, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

PLATE C



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS

PASSAIC VALLEY SEWERAGE COMMISSIONERS

MONTGOMERY STREET, PATERSON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE D

KLL001639

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

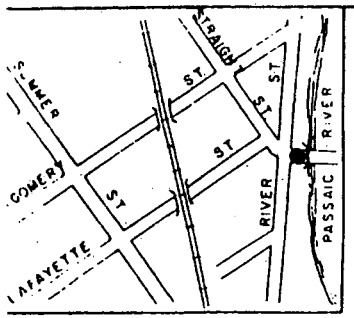
PASSAIC RIVER OVERFLOWS

STRAIGHT STREET, PATERSON
P-007

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers
[illegible] ESSEX STREET MILLBURN NEW JERSEY [illegible]

KLL001640



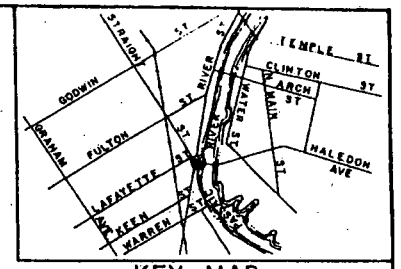
LOCATION PLAN

NOTE

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

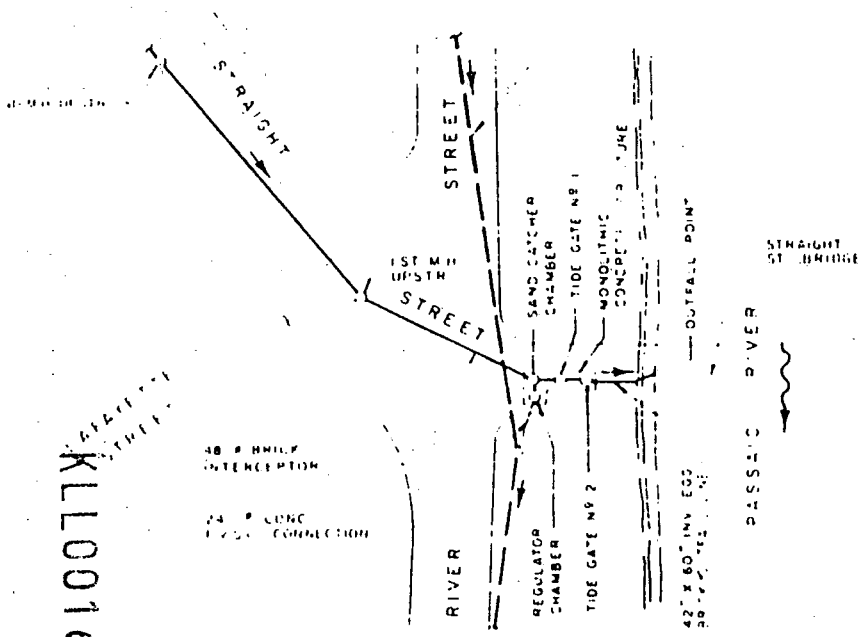
LEGEND

→ DIRECTION OF FLOW
SC = SAND CATCHER
TG = TIDE GATE
UP STR = UPSTREAM
DN STR = DOWNSTREAM
NTS = NOT TO SCALE
● = OVERFLOW LOCATION



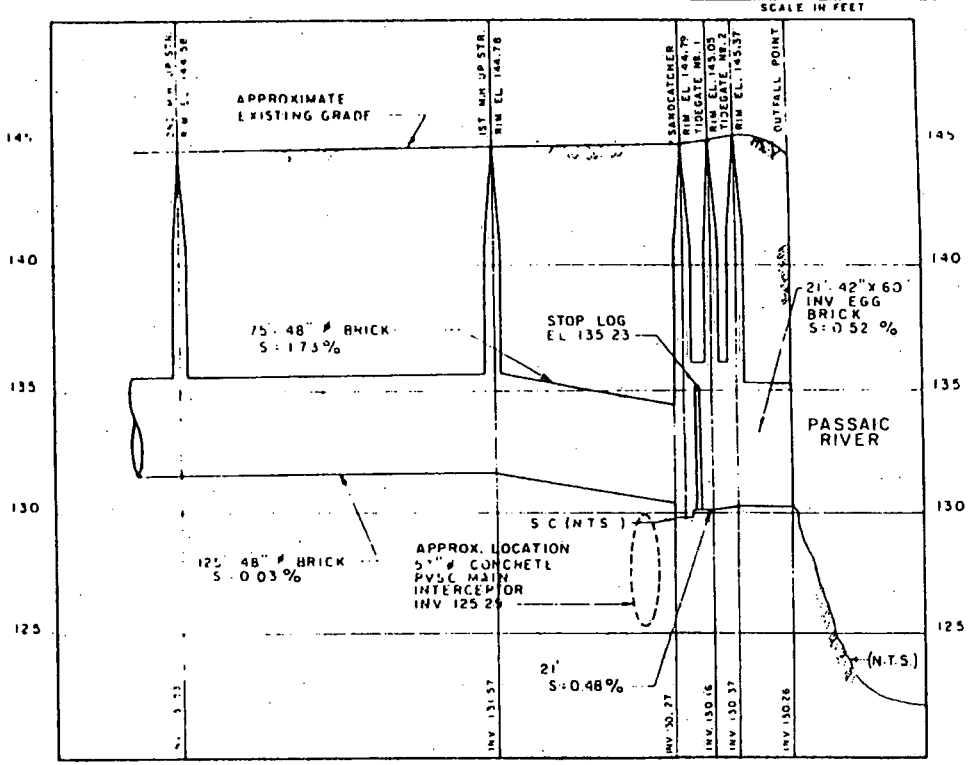
KEY MAP

2000 1000 0 2000
SCALE IN FEET



PLAN

50 25 0 50
SCALE IN FEET



PROFILE

HORIZONTAL 50 25 0 50
SCALE IN FEET

VERTICAL 5 4 3 2 1 0 3
SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS
OVERFLOW CHAMBER P-007
STRAIGHT STREET, PATERSON
PLAN AND PROFILE
ELSON T. KILLAM ASSOCIATES INC

ELEVATIONS BASED ON [illegible] AS ESTABLISHED BY [illegible] & ASSOCIATES
LOCATION AND DESCRIPTION APPENDIX

KLL001641

PLATE A

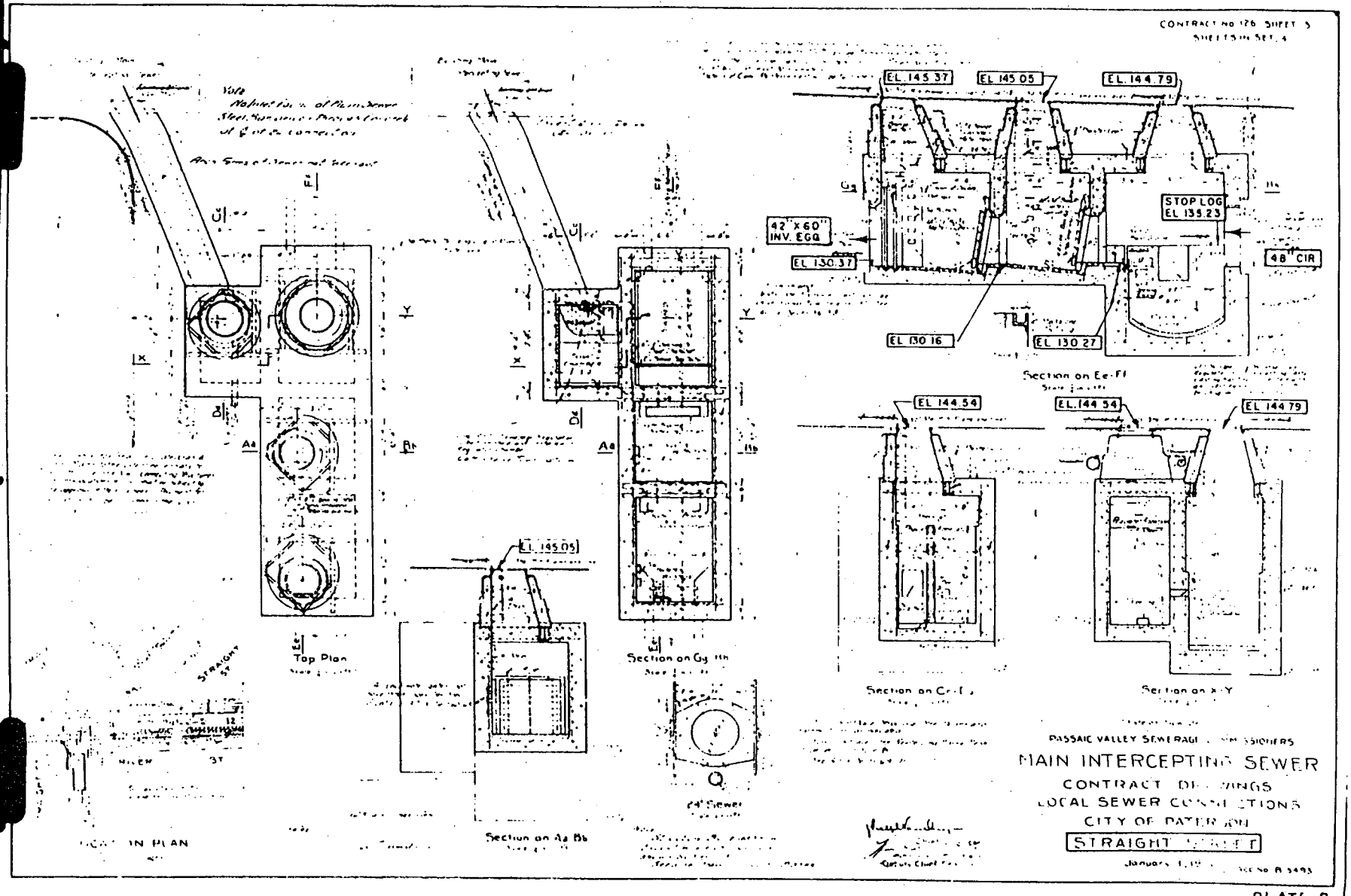
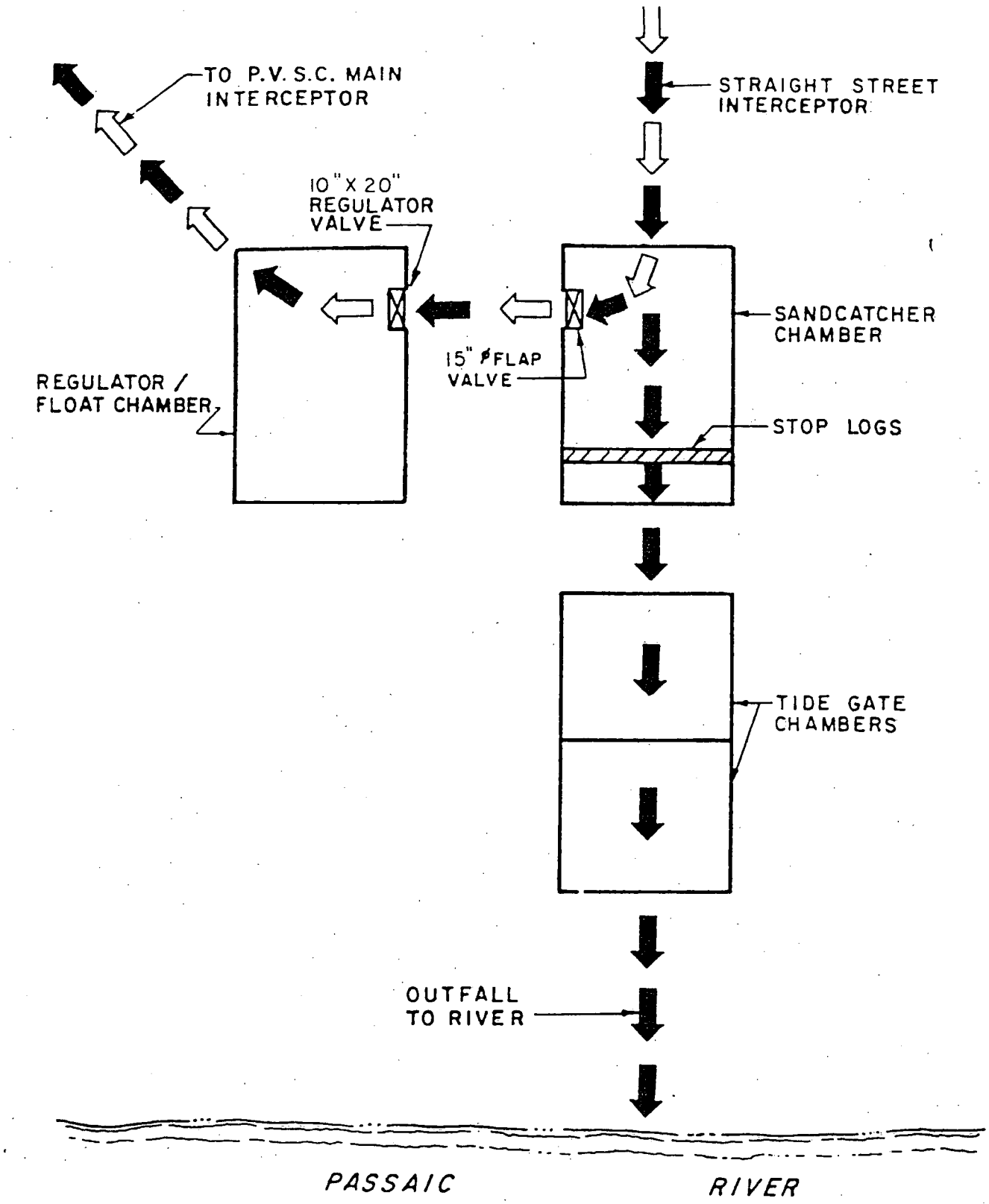


PLATE B

KLE001642



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001643

PASSAIC VALLEY SEWERAGE COMMISSIONERS

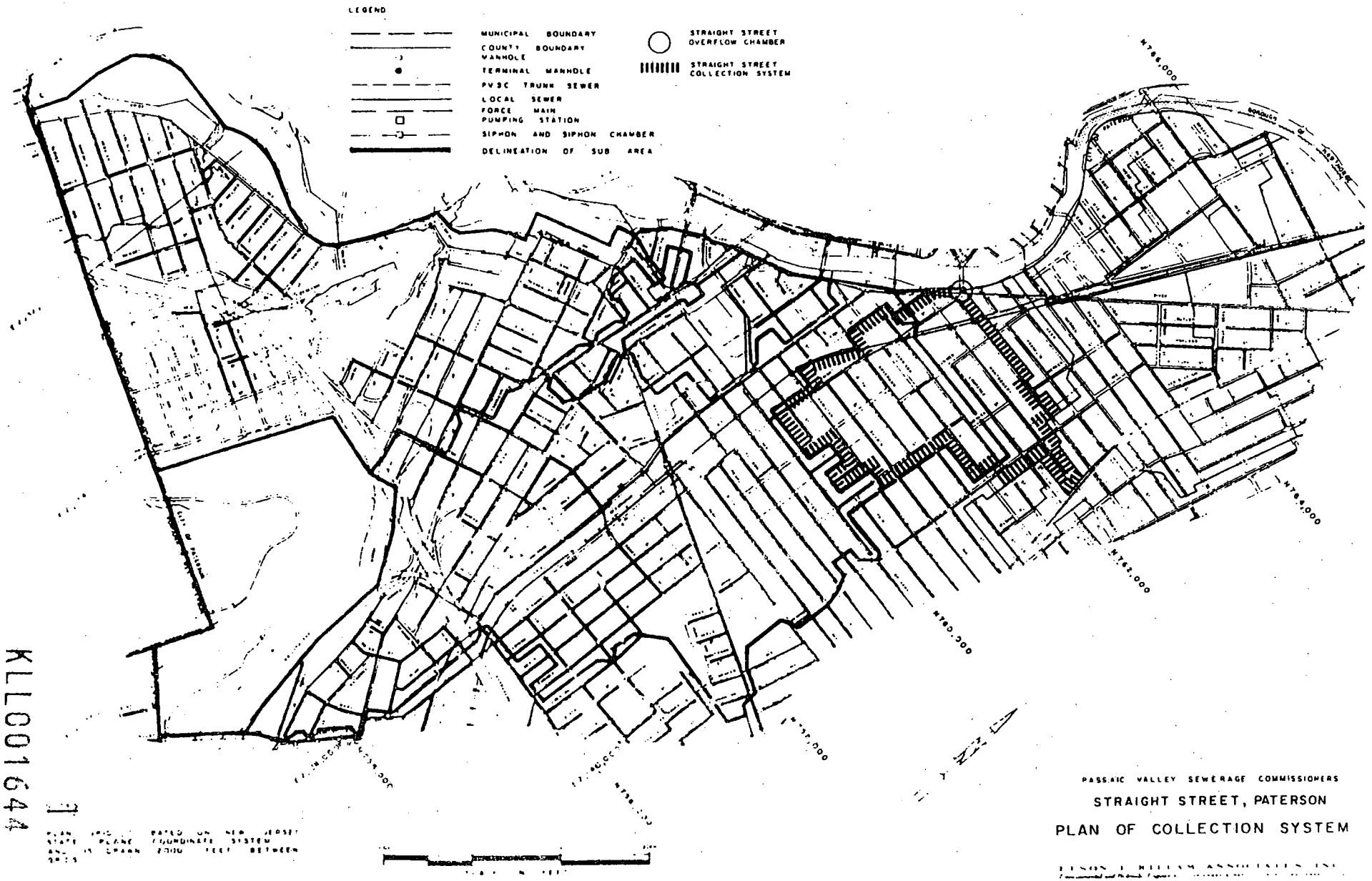
STRAIGHT STREET, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

PLATE C



PASSAIC VALLEY SEWERAGE COMMISSIONERS

STRAIGHT STREET, PATERSON

PLAN OF COLLECTION SYSTEM

PLATE D

KLL001644

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

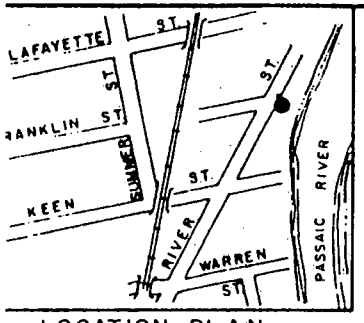
PASSAIC RIVER OVERFLOWS

FRANKLIN STREET, PATERSON
P-008

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

KLL001645

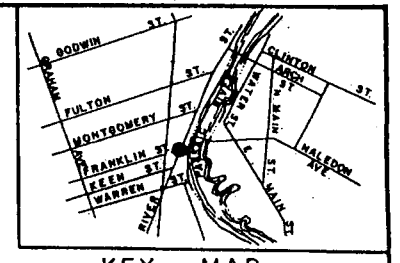


LOCATION PLAN

SCALE IN FEET

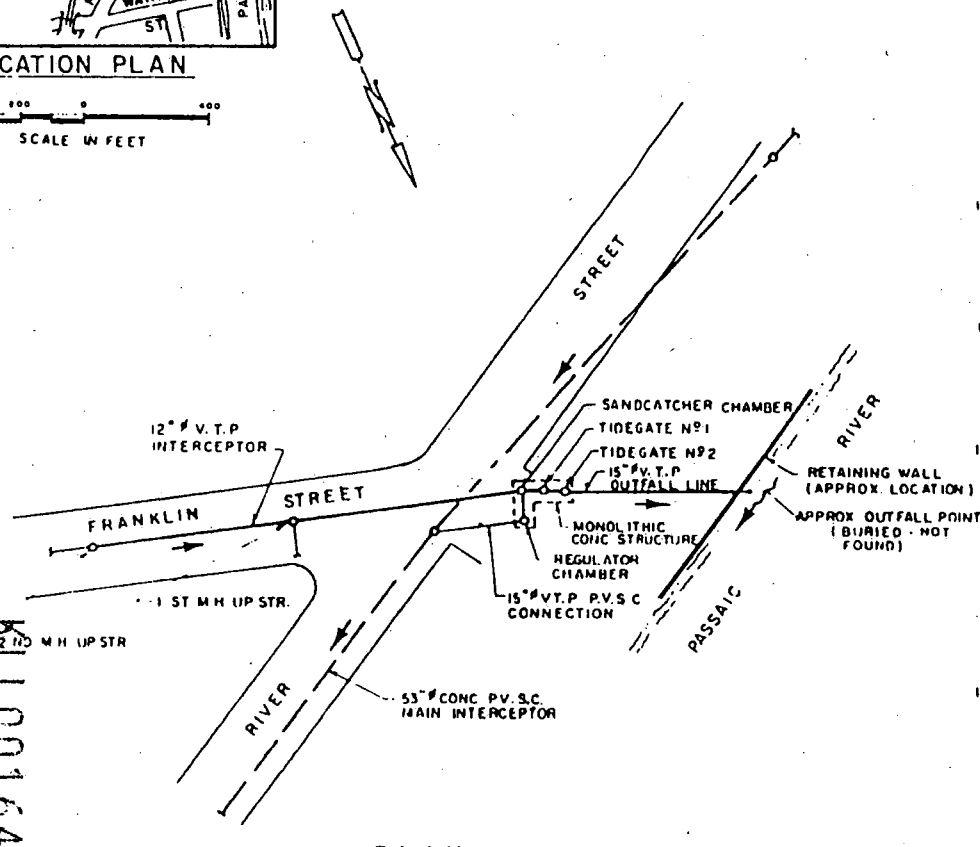
NOTE
ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

LEGEND
→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UPSTREAM
DN. STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



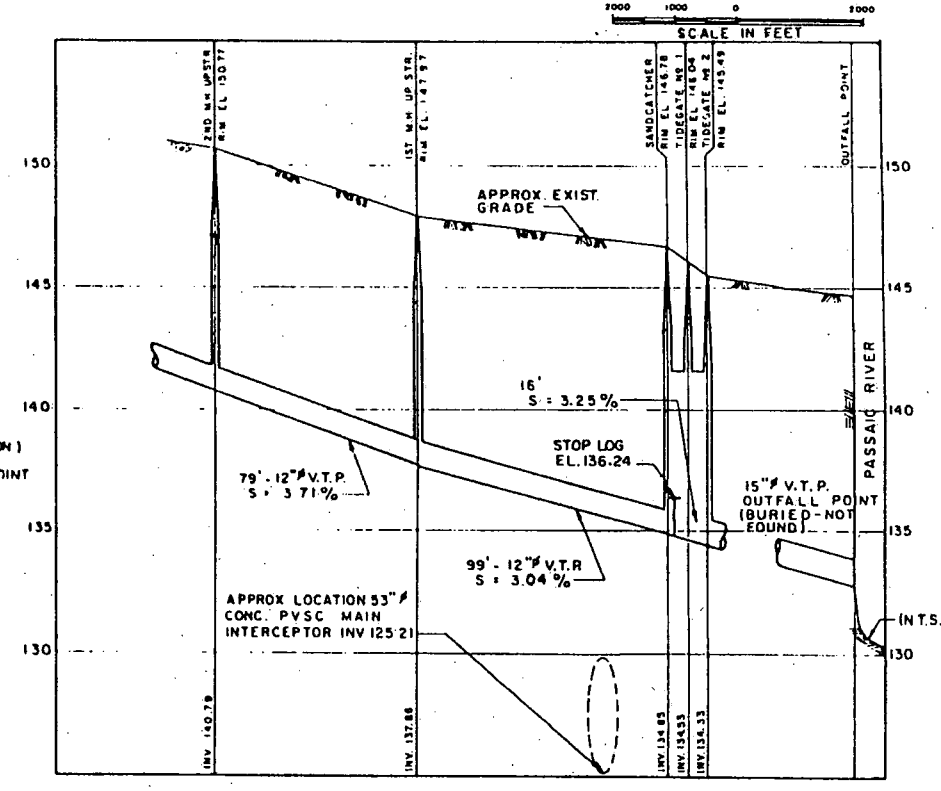
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ SCALE IN FEET

VERT SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-008

FRANKLIN STREET, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE A

KLL001646

LL ELEVATIONS BASED ON
M. NE SA AS ESTABLISHED BY
AUL J. EMILIUS & ASSOCIATES
OR LOCATION AND DESCRIPTION
EE APPENDIX

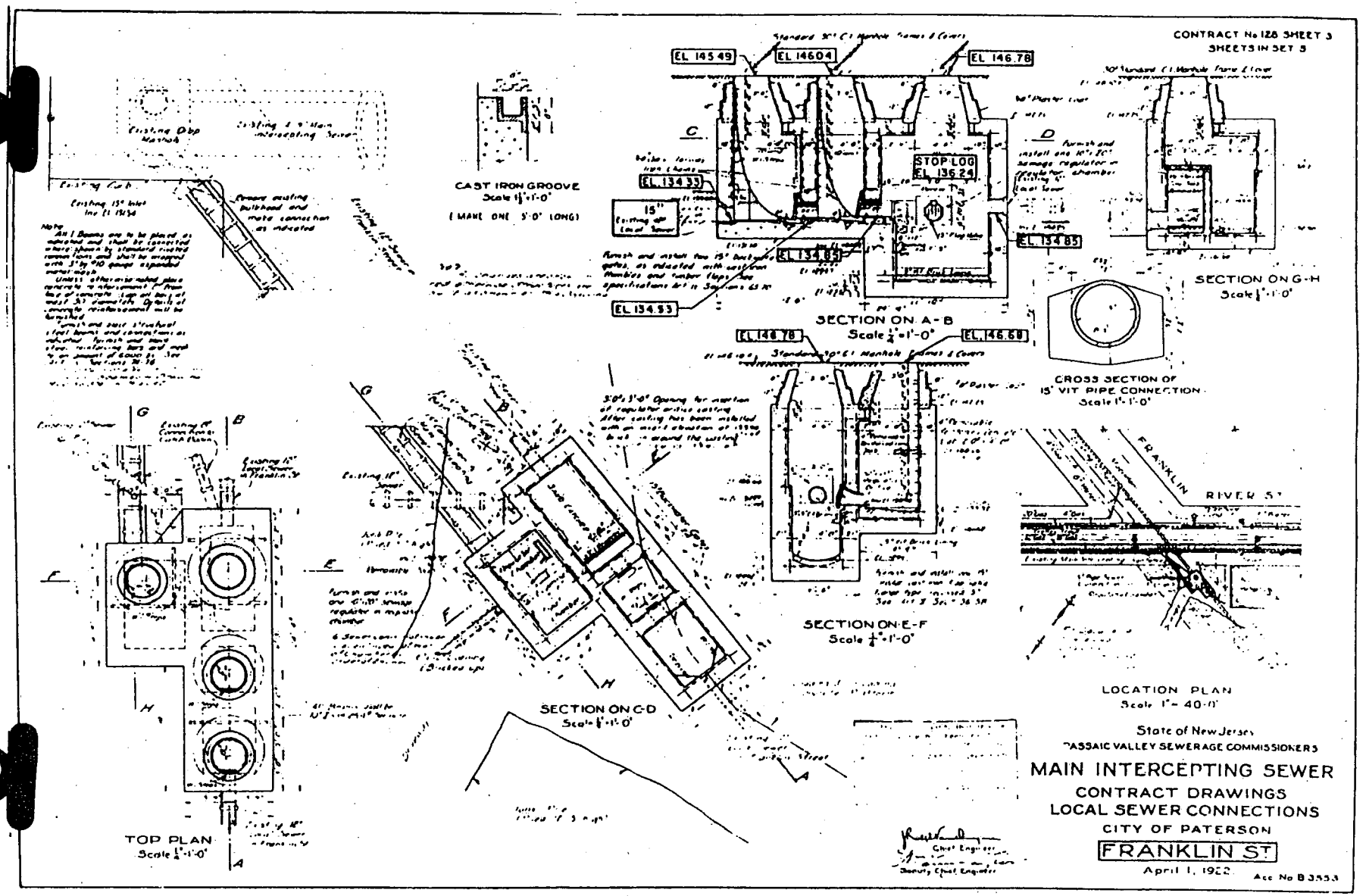
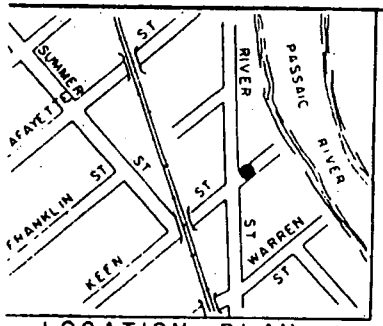


PLATE B

KLL001647



LOCATION PLAN

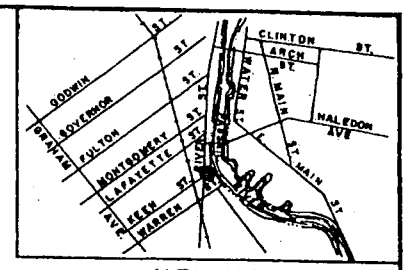
SCALE IN FEET

NOTE

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

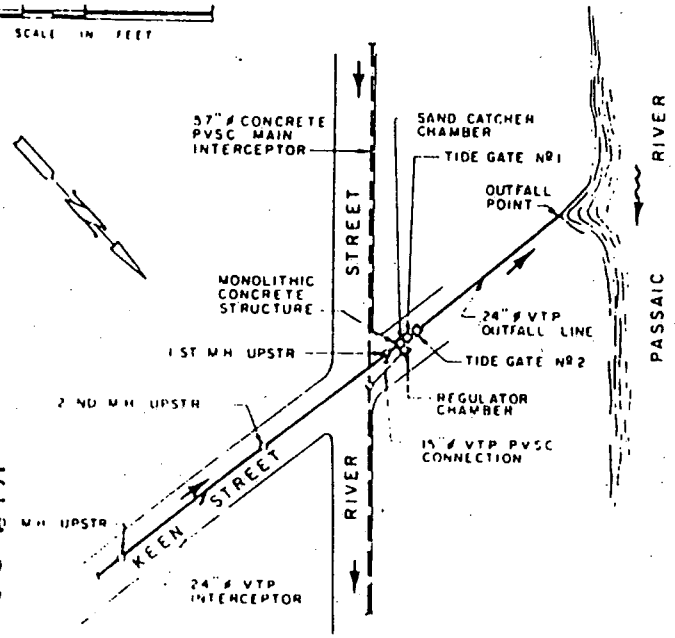
LEGEND

- → DIRECTION OF FLOW
- S.C. = SAND CATCHER
- T.G. = TIDE GATE
- UP STR. = UPSTREAM
- DN STR. = DOWNSTREAM
- N.T.S. = NOT TO SCALE
- V.T.P = VITRIFIED TILE PIPE
- ● = OVERFLOW LOCATION



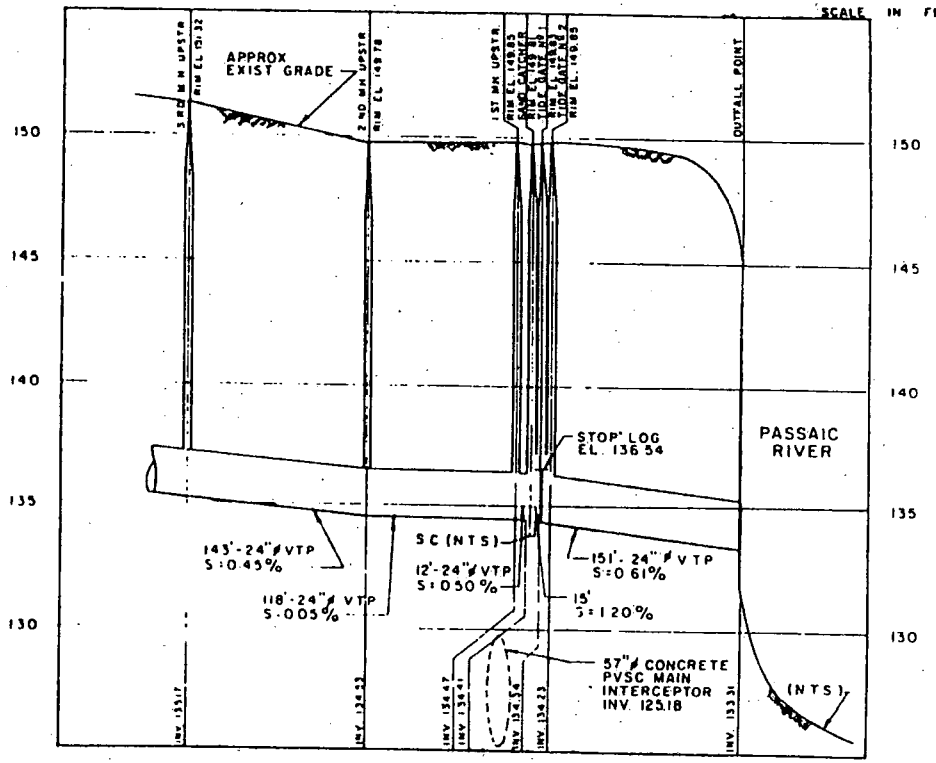
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. Nº 64 AS ESTABLISHED BY PAUL J. EMILIUS & ASSOCIATES FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-009

KEEN STREET, PATERSON

PLAN AND PROFILE

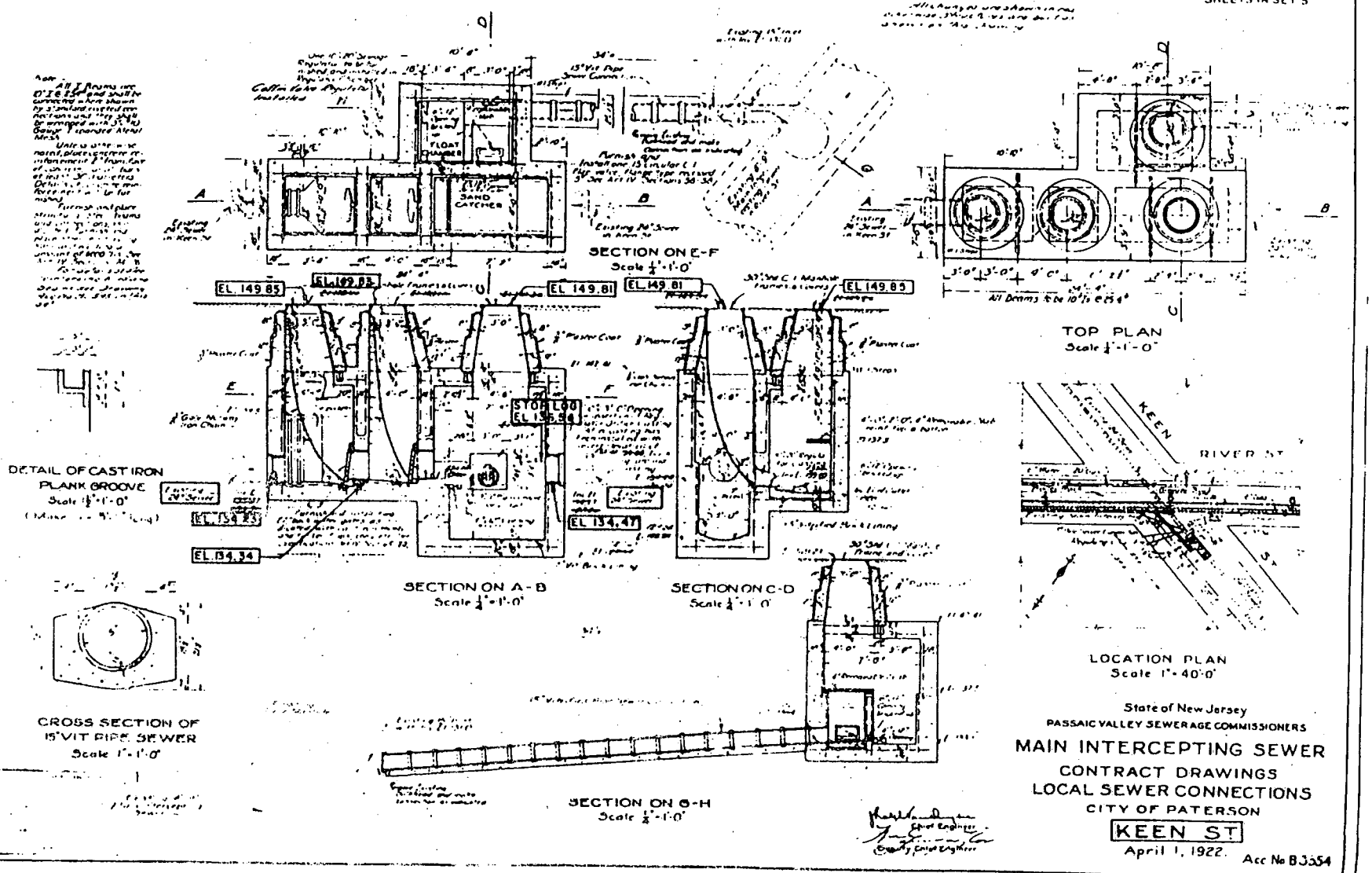
ELSON T. KILLAM ASSOCIATES INC.

Consulting and Hydraulic Engineers

KL0001648

PLATE A

CONTRACT No. 128 SHEET 4
SHEETS IN SET 5



State of New Jersey
PASSAIC VALLEY SEWERAGE COMMISSIONERS

MAIN INTERCEPTING SEWER
CONTRACT DRAWINGS
LOCAL SEWER CONNECTIONS
CITY OF PATERSON

KEEN ST

April 1, 1922. Acc No B3554

PLATE B

KLL001649

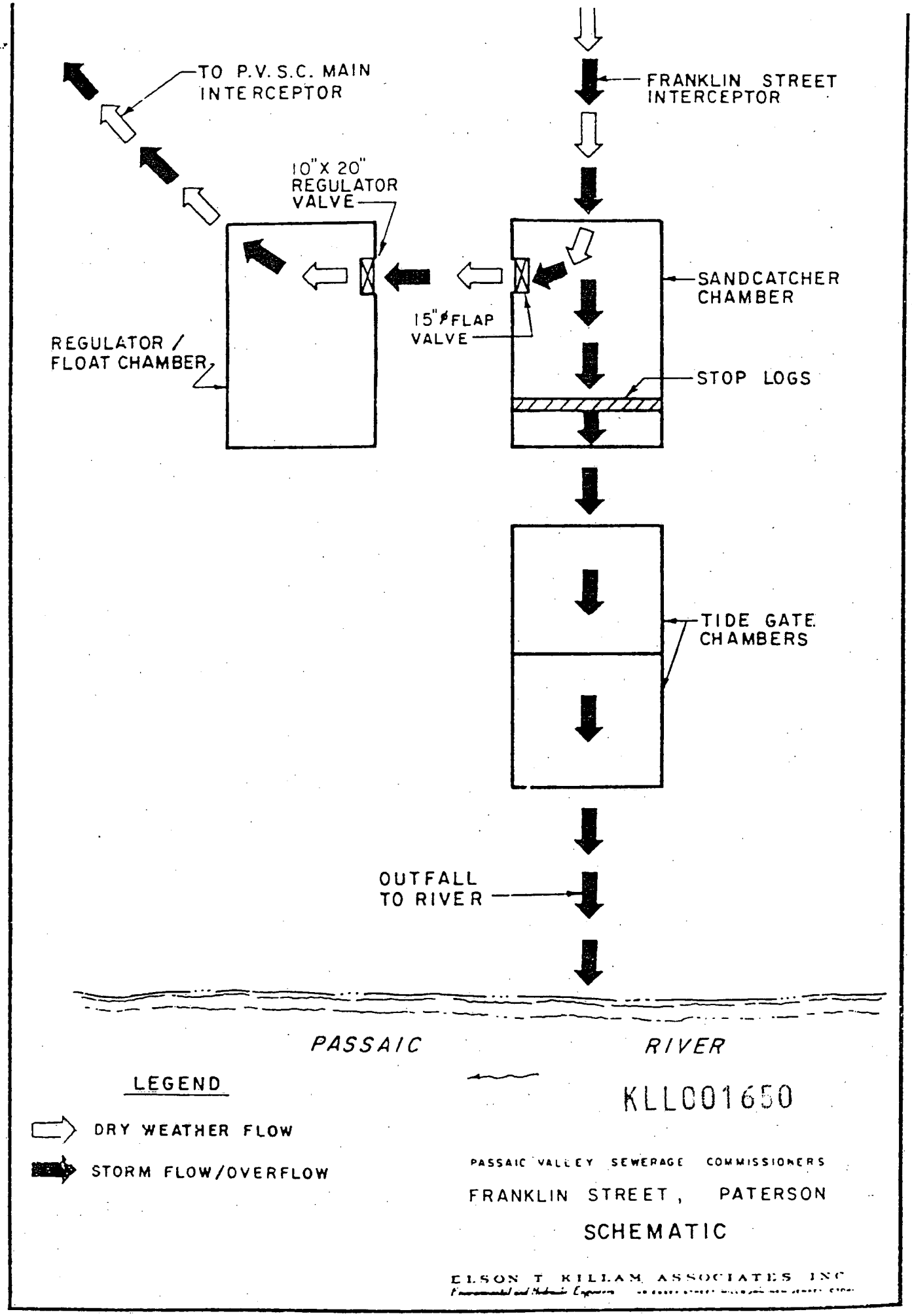

TO P.V.S.C. MAIN INTERCEPTOR
FRANKLIN STREET INTERCEPTOR
10"X 20" REGULATOR VALVE
SANDCATCHER CHAMBER
15"ø FLAP VALVE
REGULATOR / FLOAT CHAMBER
STOP LOGS
TIDE GATE CHAMBERS
OUTFALL TO RIVER
PASSAIC RIVER
LEGEND
DRY WEATHER FLOW
STORM FLOW/OVERFLOW
KLL001650
PASSAIC VALLEY SEWERAGE COMMISSIONERS
FRANKLIN STREET, PATERSON
SCHEMATIC
ELSON T. KILLAM ASSOCIATES INC

PLATE C

LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELIEATION OF SUB AREA
- FRANKLIN STREET OVERFLOW CHAMBER
- FRANKLIN STREET COLLECTION SYSTEM

SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

FRANKLIN STREET, PATERSON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC.

PLATE D

KLL001651

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

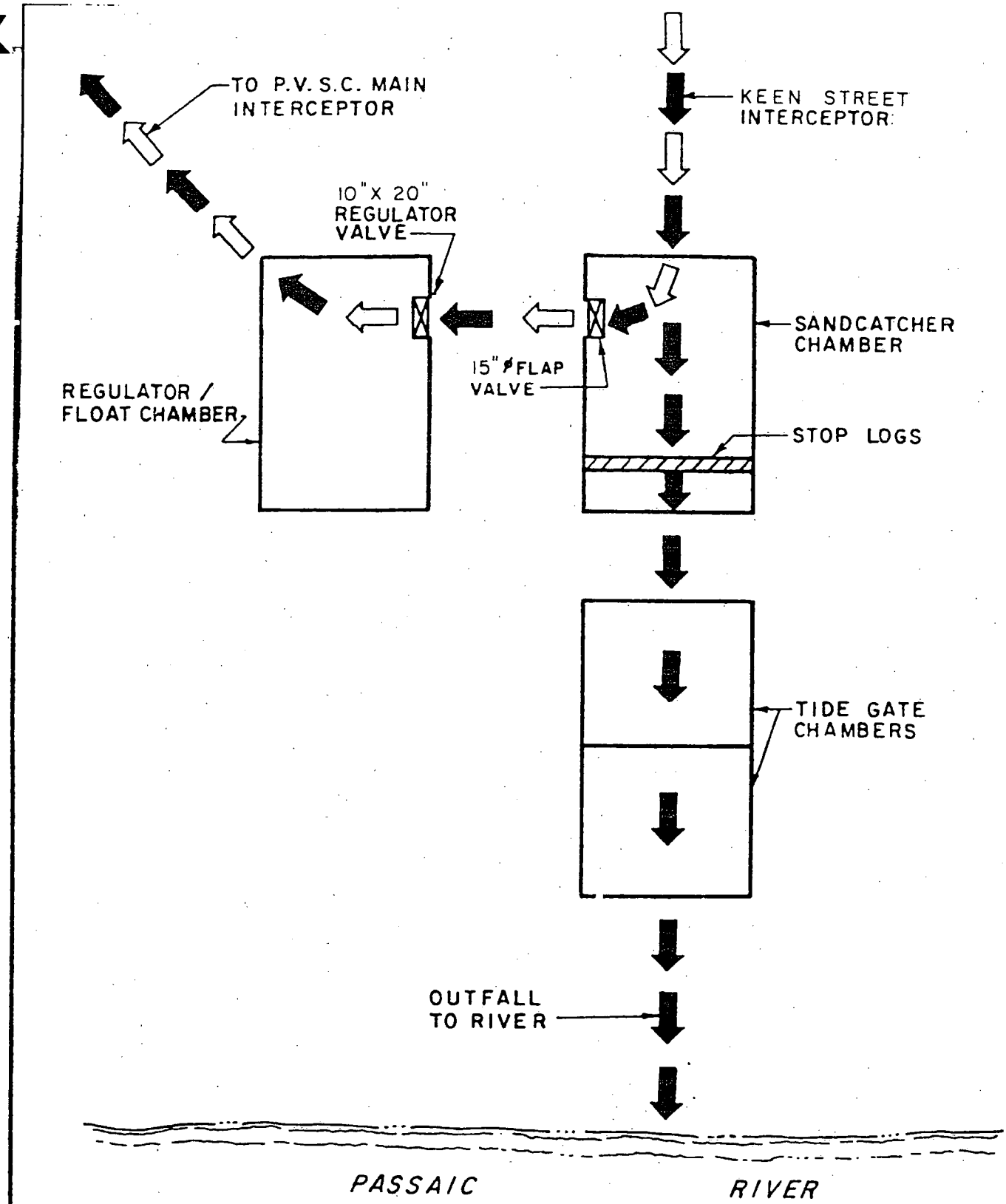
PASSAIC RIVER OVERFLOWS

KEEN STREET, PATERSON
P-009

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

KLL001652



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001653

PASSAIC VALLEY SEWERAGE COMMISSIONERS

KEEN STREET, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- KEEN STREET OVERFLOW CHAMBER
- KEEN STREET COLLECTION SYSTEM

NOTE:
COORDINATES BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND A GRID OF 2000 FEET BETWEEN GRIDS

SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

KEEN STREET, PATERSON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC.

PLATE D

KLL001654

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

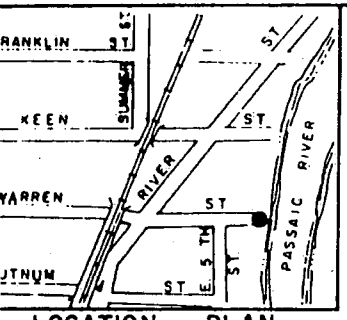
PASSAIC RIVER OVERFLOWS

WARREN STREET, PATERSON
P-010

1976

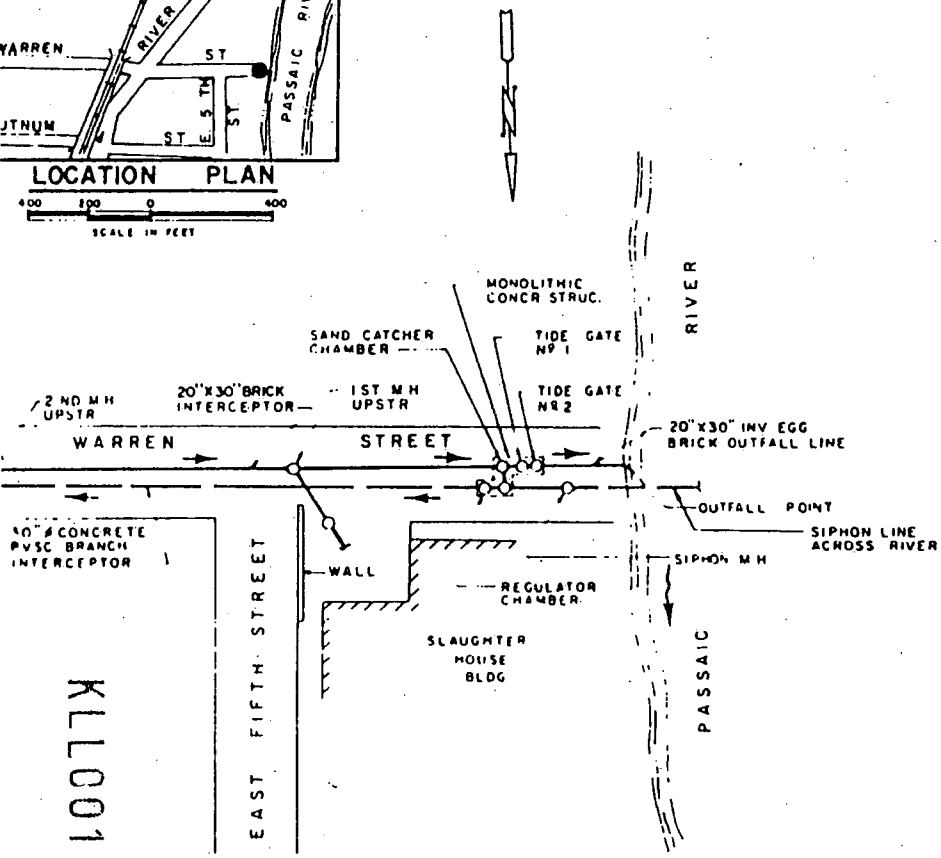
ELSON T KILLAM ASSOCIATES NJ
Environmental and Hydraulic Engineers

KLL001655



LOCATION PLAN

400 200 0 400
SCALE IN FEET



PLAN

30 15 0 30
SCALE IN FEET

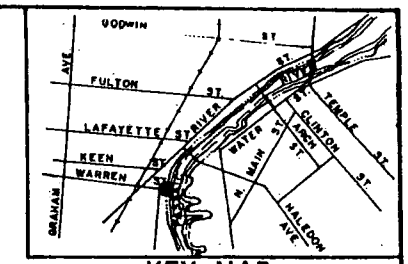
ALL ELEVATIONS BASED ON B.M. Nº 1 AS ESTABLISHED BY PAUL J. EWLING & ASSOCIATES FOR LOCATION AND DESCRIPTION SEE APPENDIX.

NOTE:

ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

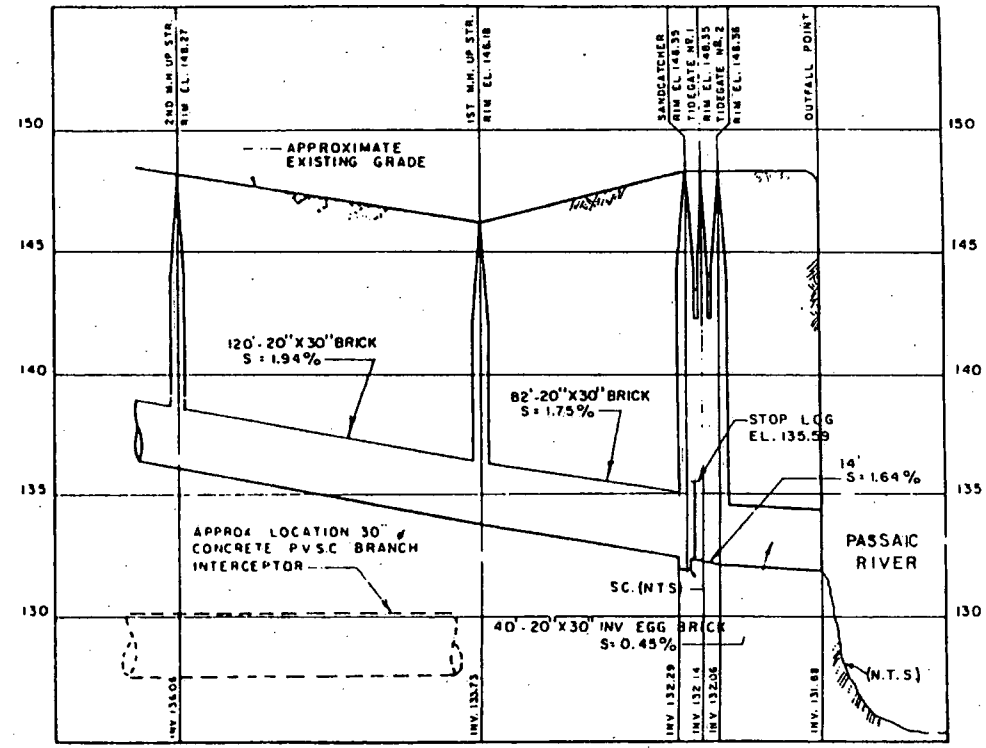
LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UPSTREAM
DN. STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
RCP = REINFORCED CONCRETE PIPE
● = OVERFLOW LOCATION



KEY MAP

2000 1000 0 2000
SCALE IN FEET



PROFILE

HORIZONTAL 50 25 0 50
SCALE IN FEET

VERTICAL 5 4 3 2 1 0 5
SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-010

WARREN STREET, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

PLATE A

KLL001656

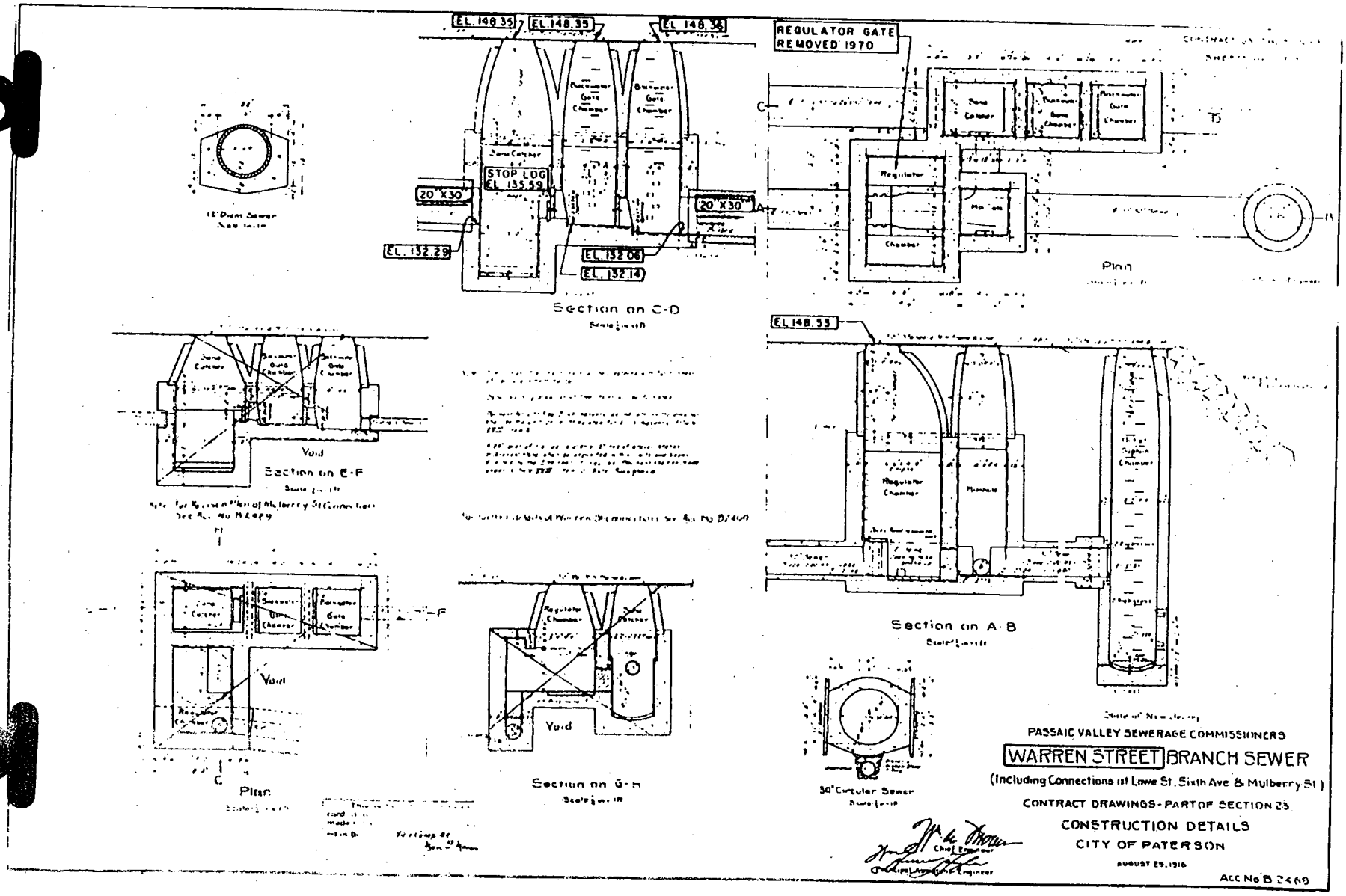
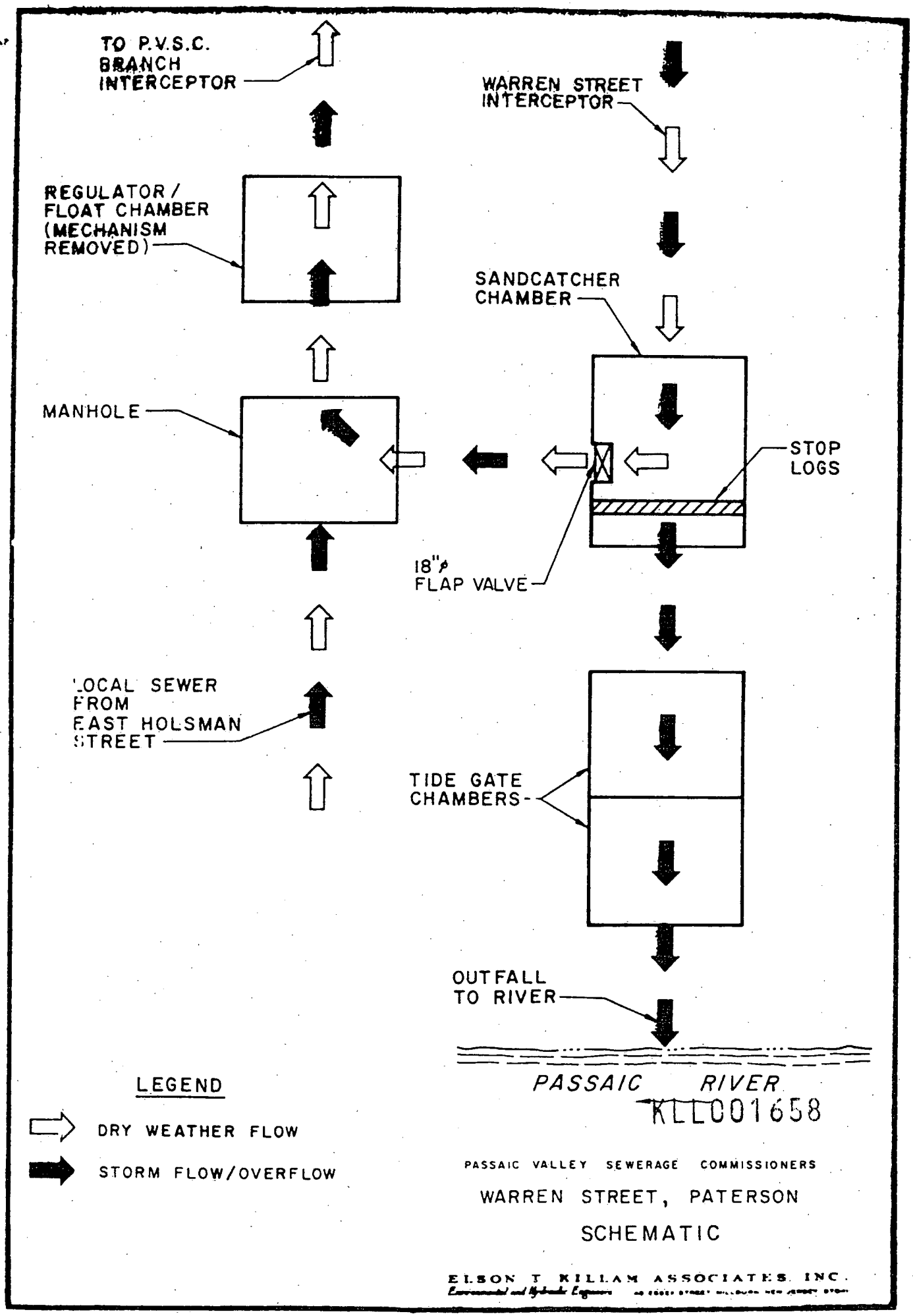
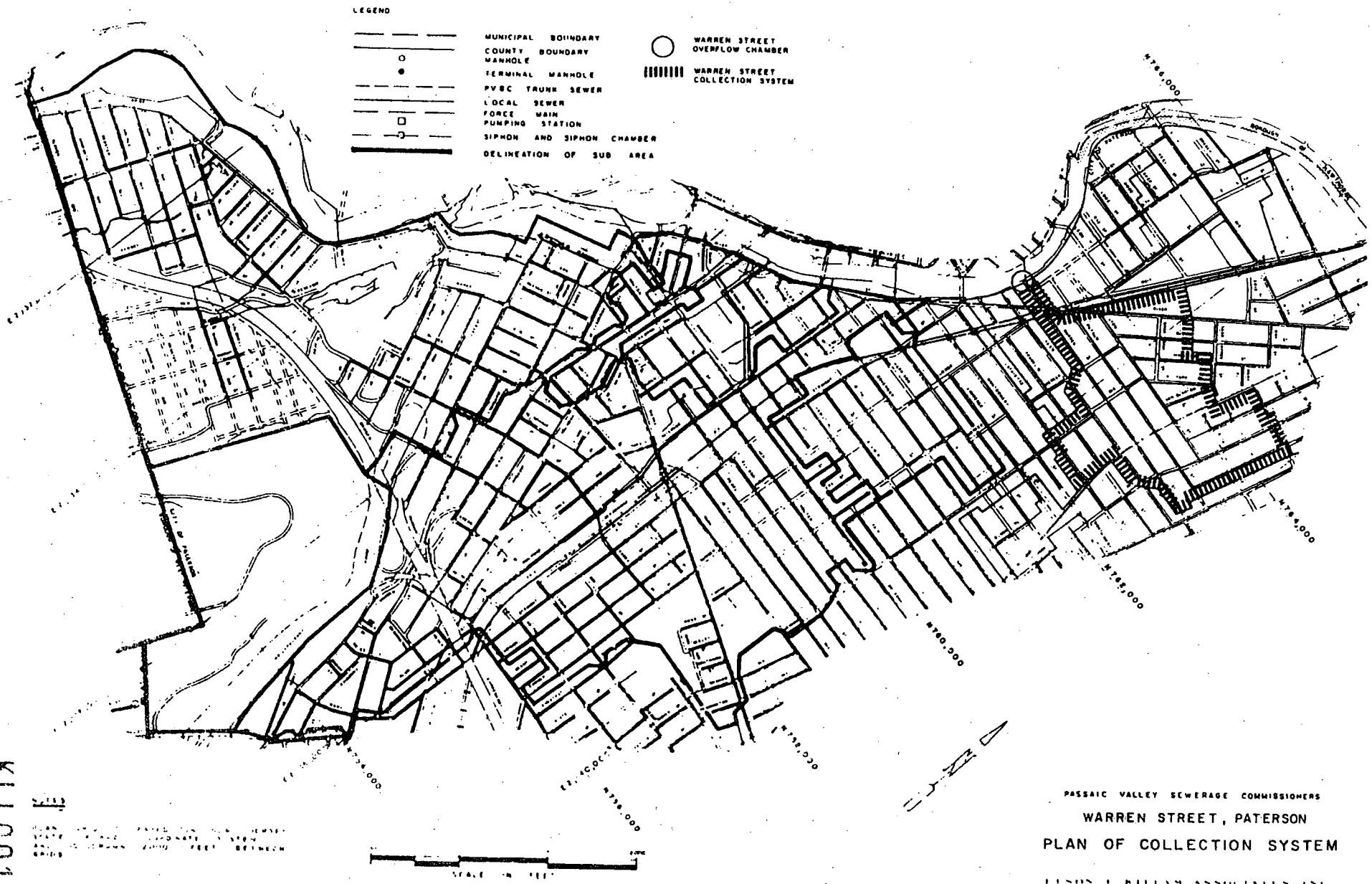


PLATE B

KLL001657


TO P.V.S.C.
BRANCH
INTERCEPTOR
WARREN STREET
INTERCEPTOR
REGULATOR/
FLOAT CHAMBER
(MECHANISM
REMOVED)
SANDCATCHER
CHAMBER
MANHOLE
STOP
LOGS
18"ø
FLAP VALVE
LOCAL SEWER
FROM
EAST HOLSMAN
STREET
TIDE GATE
CHAMBERS
OUTFALL
TO RIVER
PASSAIC RIVER
LEGEND
DRY WEATHER FLOW
STORM FLOW/OVERFLOW
PASSAIC VALLEY SEWERAGE COMMISSIONERS
WARREN STREET, PATERSON
SCHEMATIC
ELSON T. KILLAM ASSOCIATES, INC.

KLL001658



PASSAIC VALLEY SEWERAGE COMMISSIONERS

WARREN STREET, PATERSON

PLAN OF COLLECTION SYSTEM

PLATE D

KLL001659

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

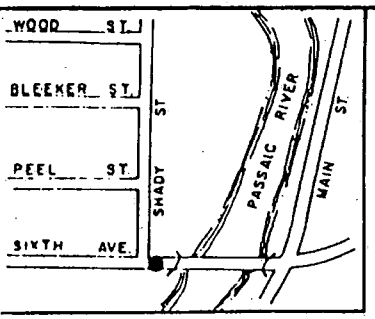
PASSAIC RIVER OVERFLOWS

SIXTH AVENUE, PATERSON
P-011

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

KLL001660



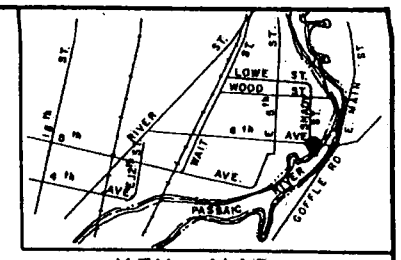
LOCATION PLAN

SCALE IN FEET

NOTE:
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

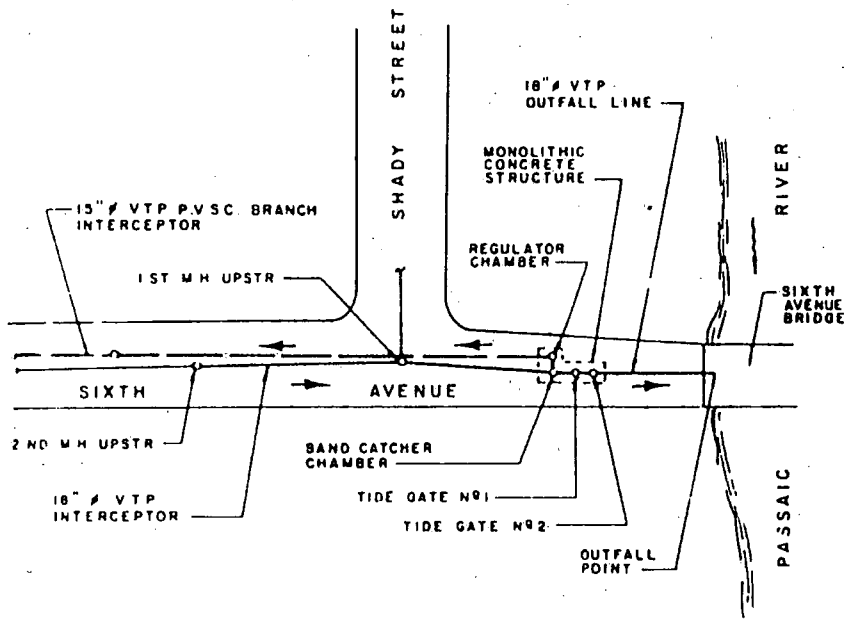
LEGEND:

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



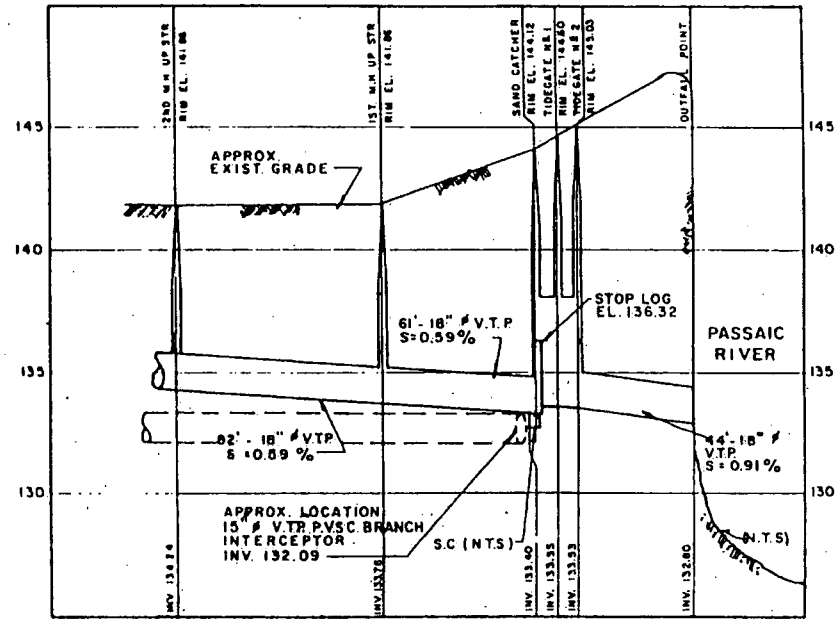
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ SCALE IN FEET

VERT. SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-011

SIXTH AVENUE, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Consulting and Hydraulic Engineers

ALL ELEVATIONS BASED ON B.M. Nº 8 AS ESTABLISHED BY PAUL J. EMLING & ASSOCIATES FOR LOCATION AND DESCRIPTION SEE APPENDIX

KLL001661

PLATE

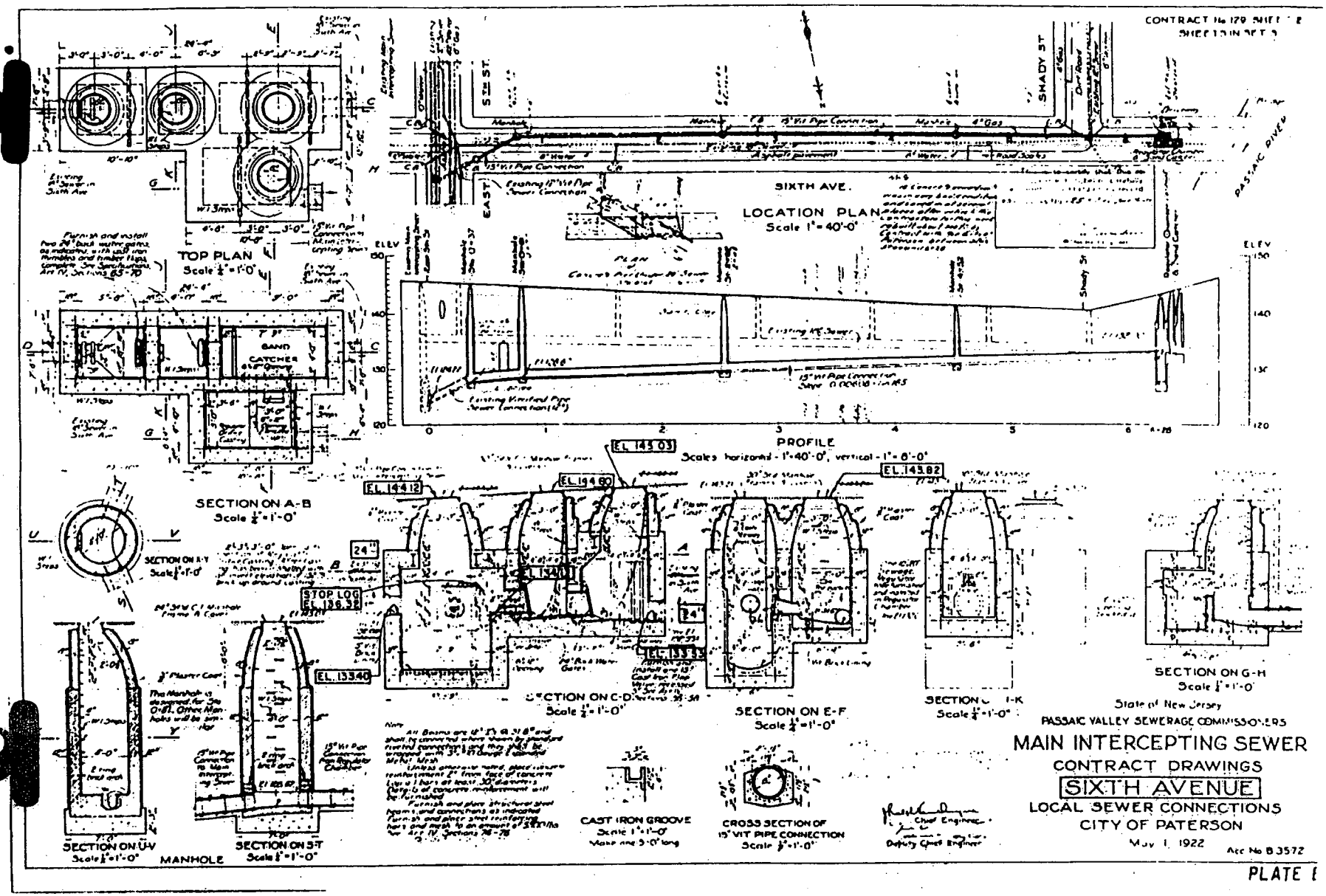
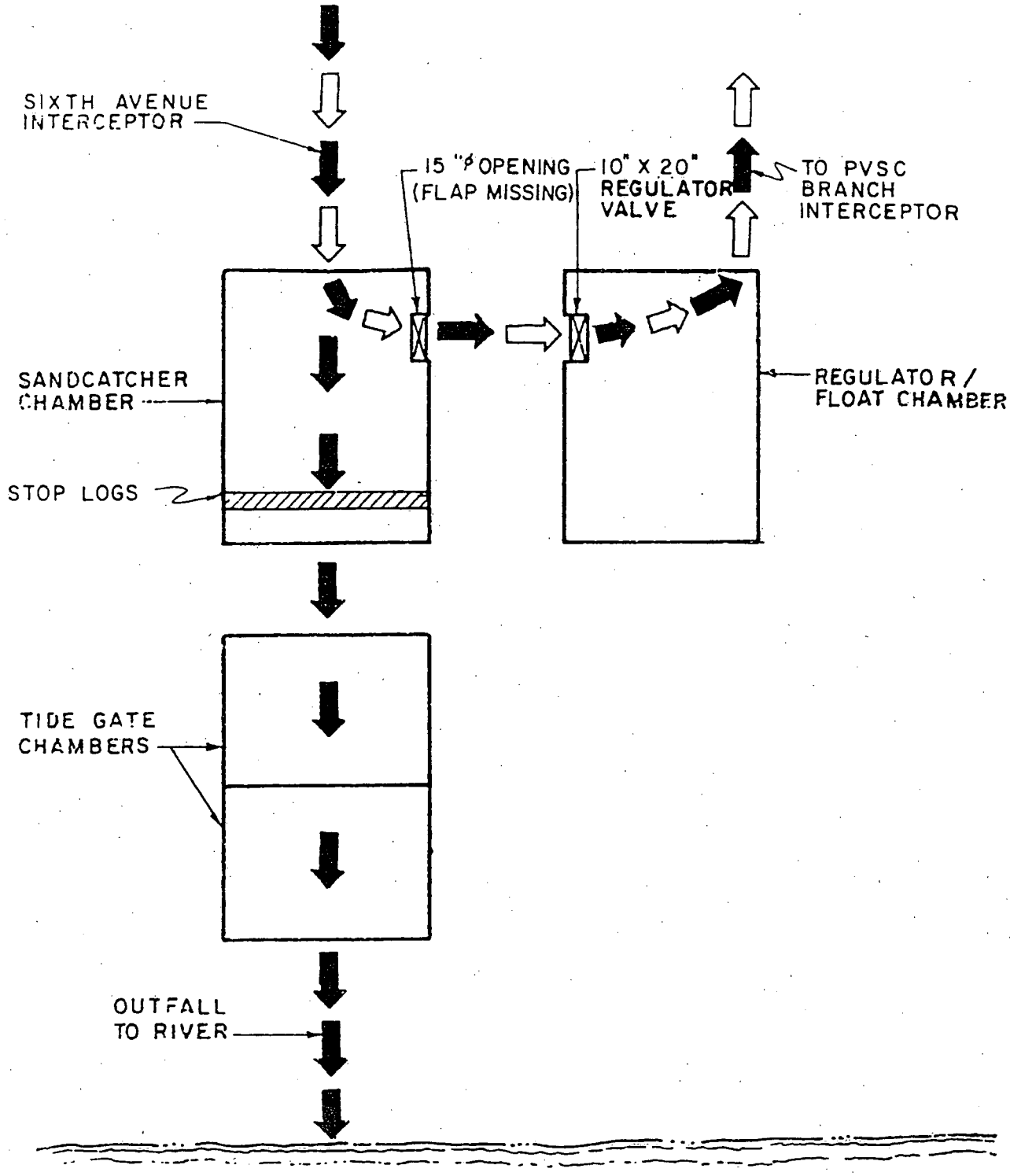


PLATE I

(3)

KLL001662



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001663

PASSAIC VALLEY SEWERAGE COMMISSIONERS

SIXTH AVENUE, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- LOCATION OF SUB AREA
- SIXTH AVENUE OVERFLOW CHAMBER
- SIXTH AVENUE COLLECTION SYSTEM

SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

SIXTH AVENUE, PATERSON

PLAN OF COLLECTION SYSTEM

PLATE D

KLL001664

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

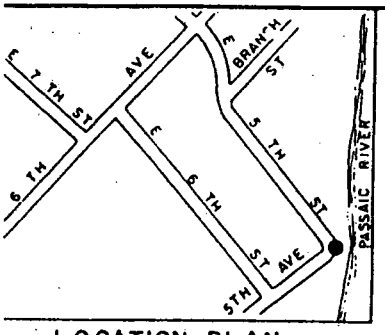
PASSAIC RIVER OVERFLOWS

EAST 5th ST. & 5th AVE., PATERSON
P-012

1976

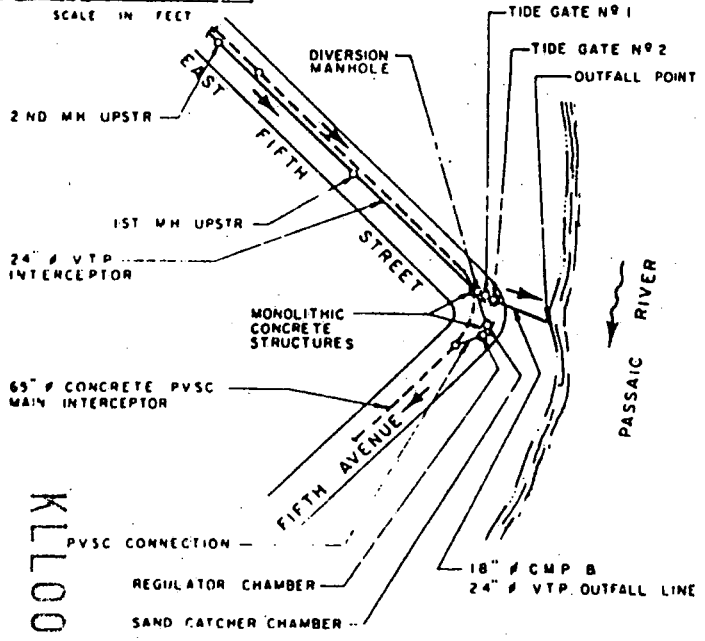
ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

KLL001665



LOCATION PLAN

SCALE IN FEET



PLAN

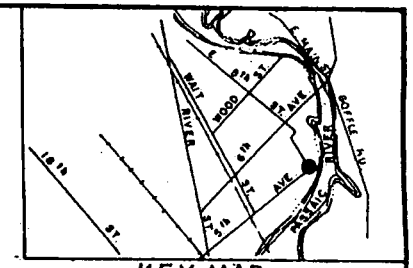
SCALE IN FEET

NOTE:

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

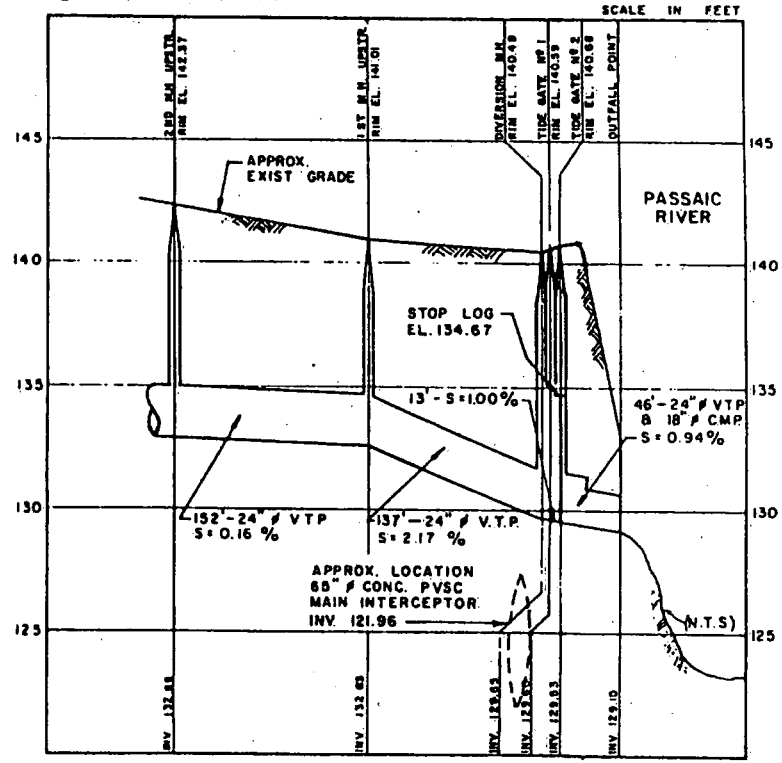
LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UPSTREAM
DN. STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
CMP = CORRUGATED METAL PIPE
V.T.P = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



KEY MAP

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-012

EAST FIFTH STREET AND FIFTH AVENUE, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE A

KLL001666

L ELEVATIONS BASED ON
M Nº 10 AS ESTABLISHED BY
A. J. EMILIUS & ASSOCIATES
R LOCATION AND DESCRIPTION
E APPENDIX

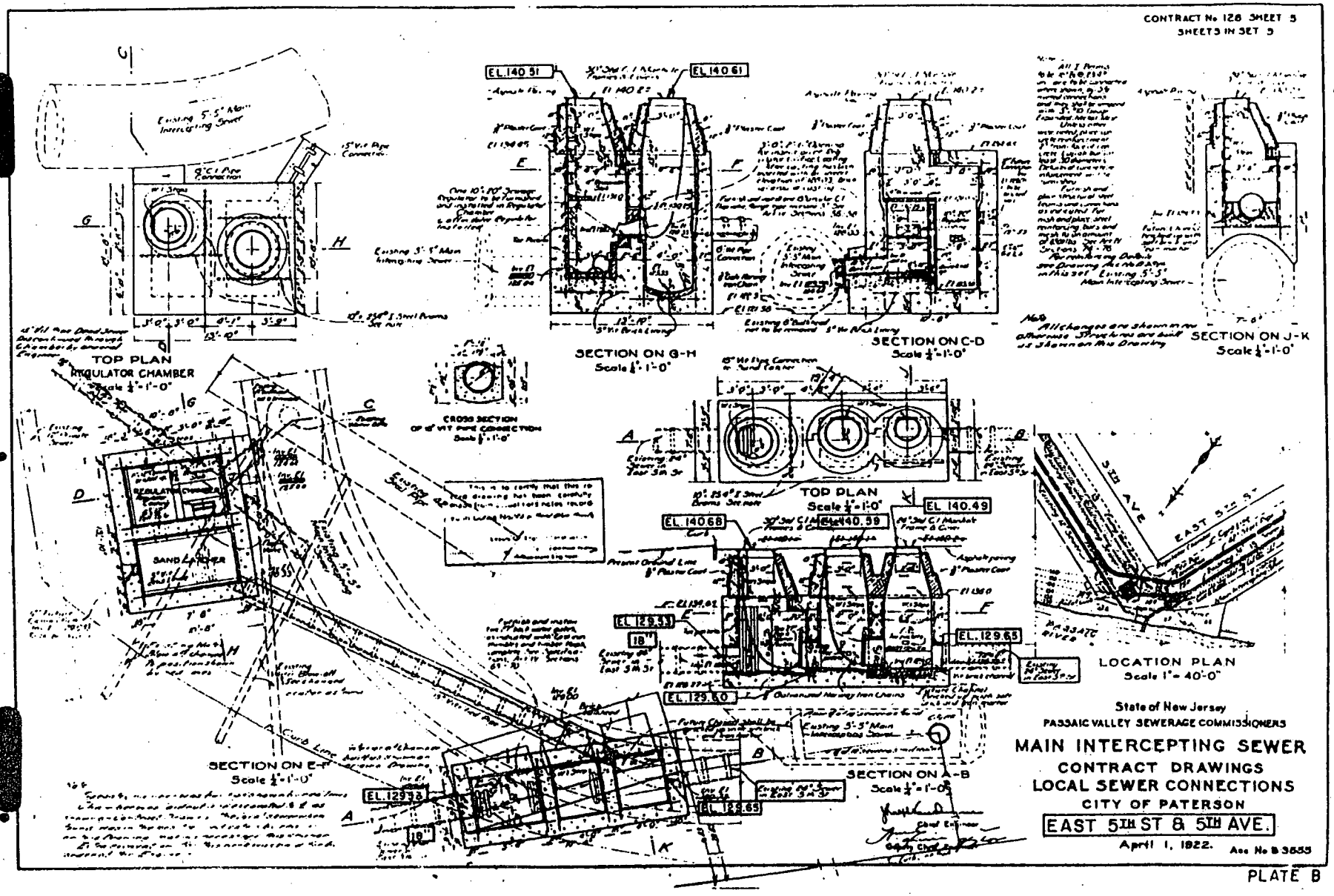


PLATE B

(3)

KLL001667

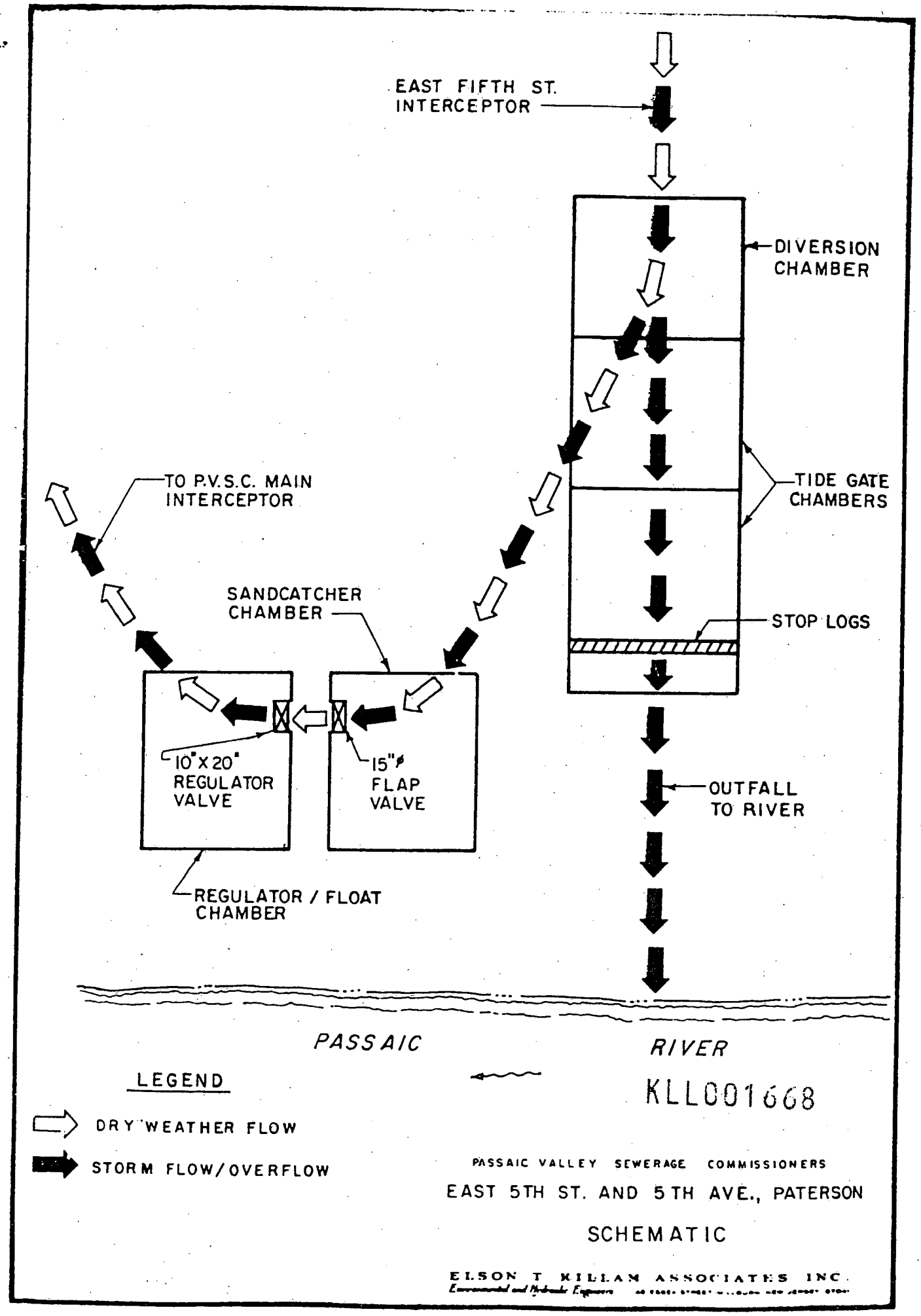

EAST FIFTH ST.
INTERCEPTOR
DIVERSION
CHAMBER
TIDE GATE
CHAMBERS
STOP LOGS
TO P.V.S.C. MAIN
INTERCEPTOR
SANDCATCHER
CHAMBER
10"X20"
REGULATOR
VALVE
15"ø
FLAP
VALVE
OUTFALL
TO RIVER
REGULATOR / FLOAT
CHAMBER
PASSAIC
RIVER
LEGEND
DRY WEATHER FLOW
STORM FLOW/OVERFLOW
KLL001668
PASSAIC VALLEY SEWERAGE COMMISSIONERS
EAST 5TH ST. AND 5TH AVE., PATERSON
SCHEMATIC
ELSON T. KILLAM ASSOCIATES INC.

PLATE C

LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- EAST 5th ST. & 5th AVE. OVERFLOW CHAMBER
- EAST 5th ST. & 5th AVE. COLLECTION SYSTEM

NOTE:
PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND [illegible] FEET BETWEEN GRIDS

SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

EAST 5th ST. & 5th AVE., PATERSON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC

PLATE [

KLL001669

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

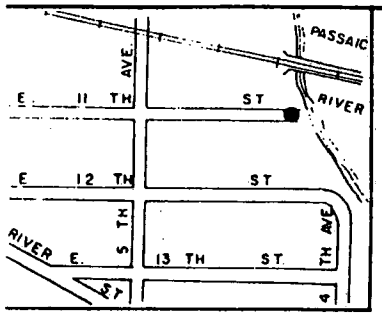
PASSAIC RIVER OVERFLOWS

EAST ELEVENTH STREET, PATERSON
P-013

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001670



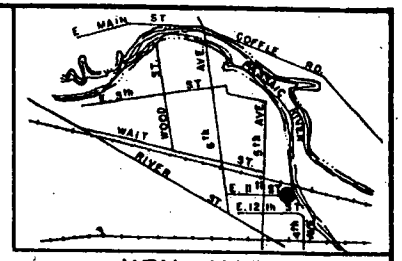
LOCATION PLAN

SCALE IN FEET

NOTE:
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

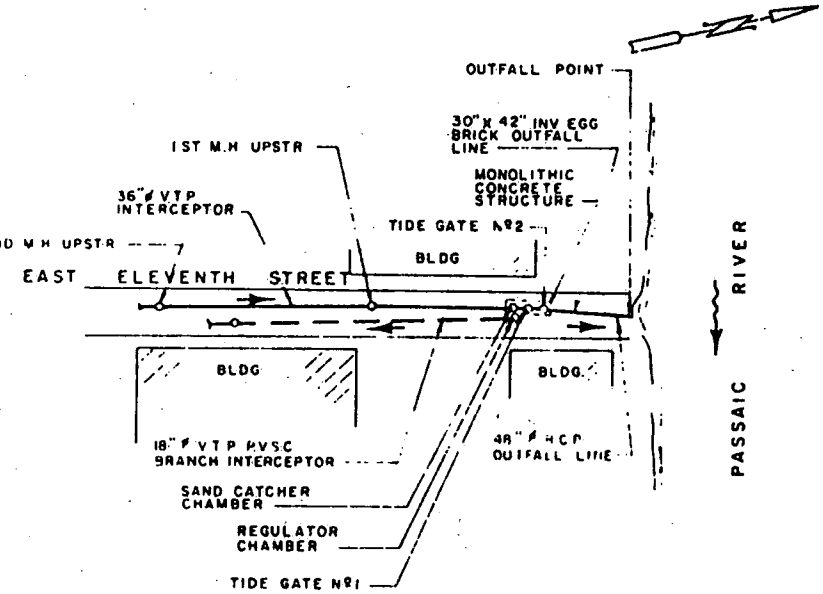
LEGEND:

- DIRECTION OF FLOW
- S.C. = SAND CATCHER
- T G = TIDE GATE
- UP STR = UP STREAM
- DN STR = DOWN STREAM
- N T S = NOT TO SCALE
- V T P = VITRIFIED TILE PIPE
- R C P = REINFORCED CONCRETE PIPE
- ● = OVERFLOW LOCATION



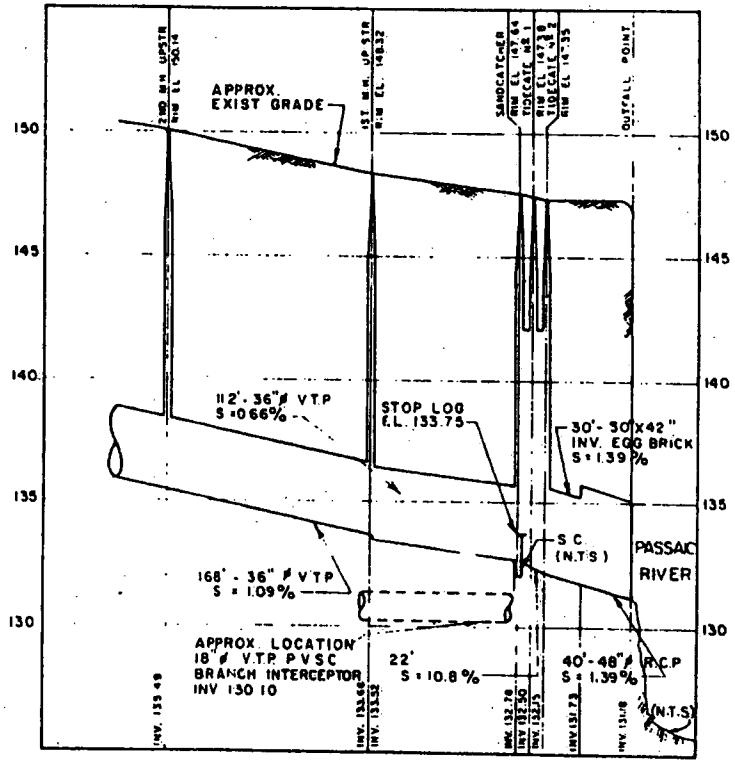
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON BM Nº 14 AS ESTABLISHED BY PAUL J. EMILIUS & ASSOCIATES FOR LOCATION AND DESCRIPTION SEE APPENDIX

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-013

EAST 11th STREET, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.

PLATE

KLL001671

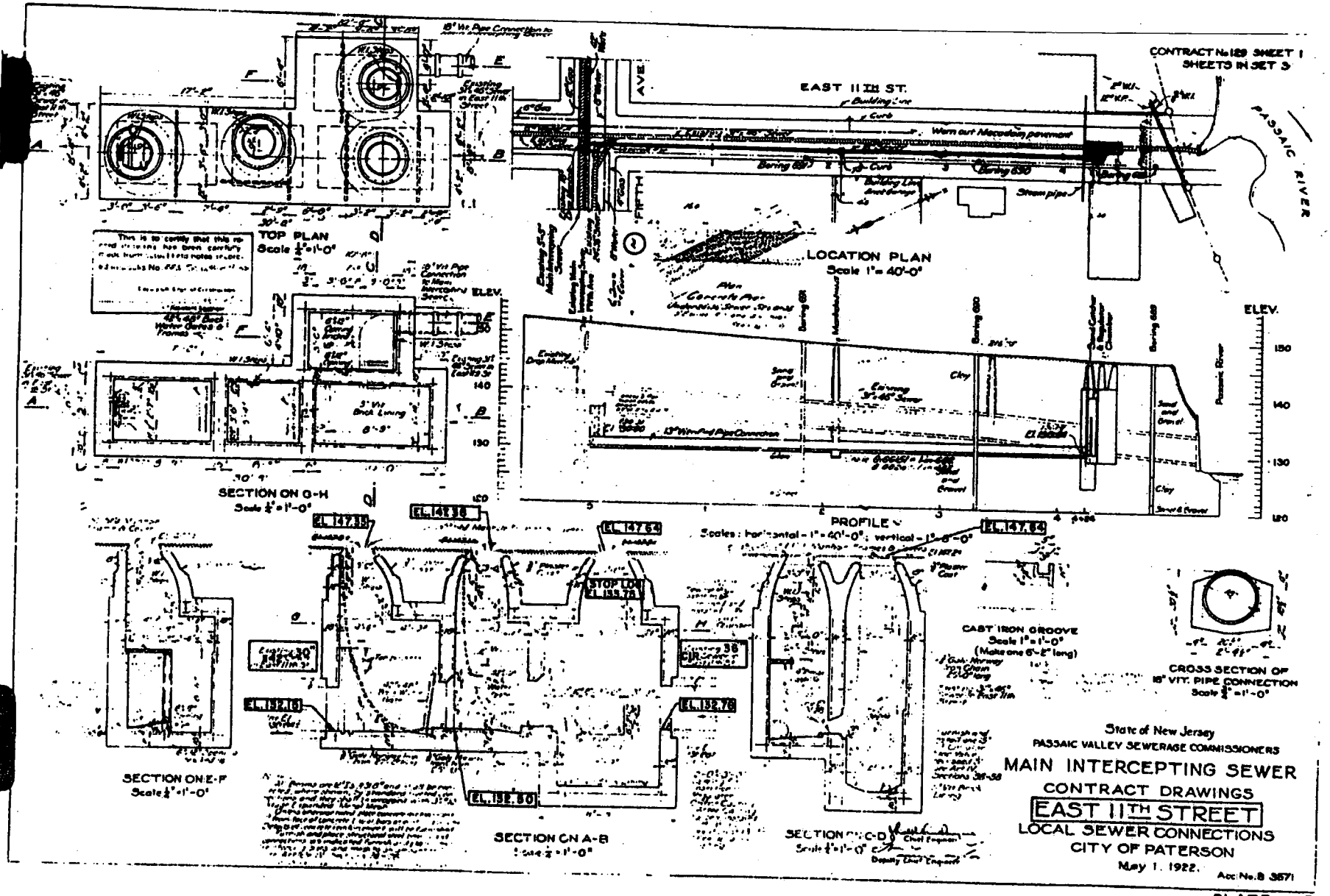


PLATE B

(3)

C1672

PASSAIC VALLEY SEWERAGE COMMISSIONERS

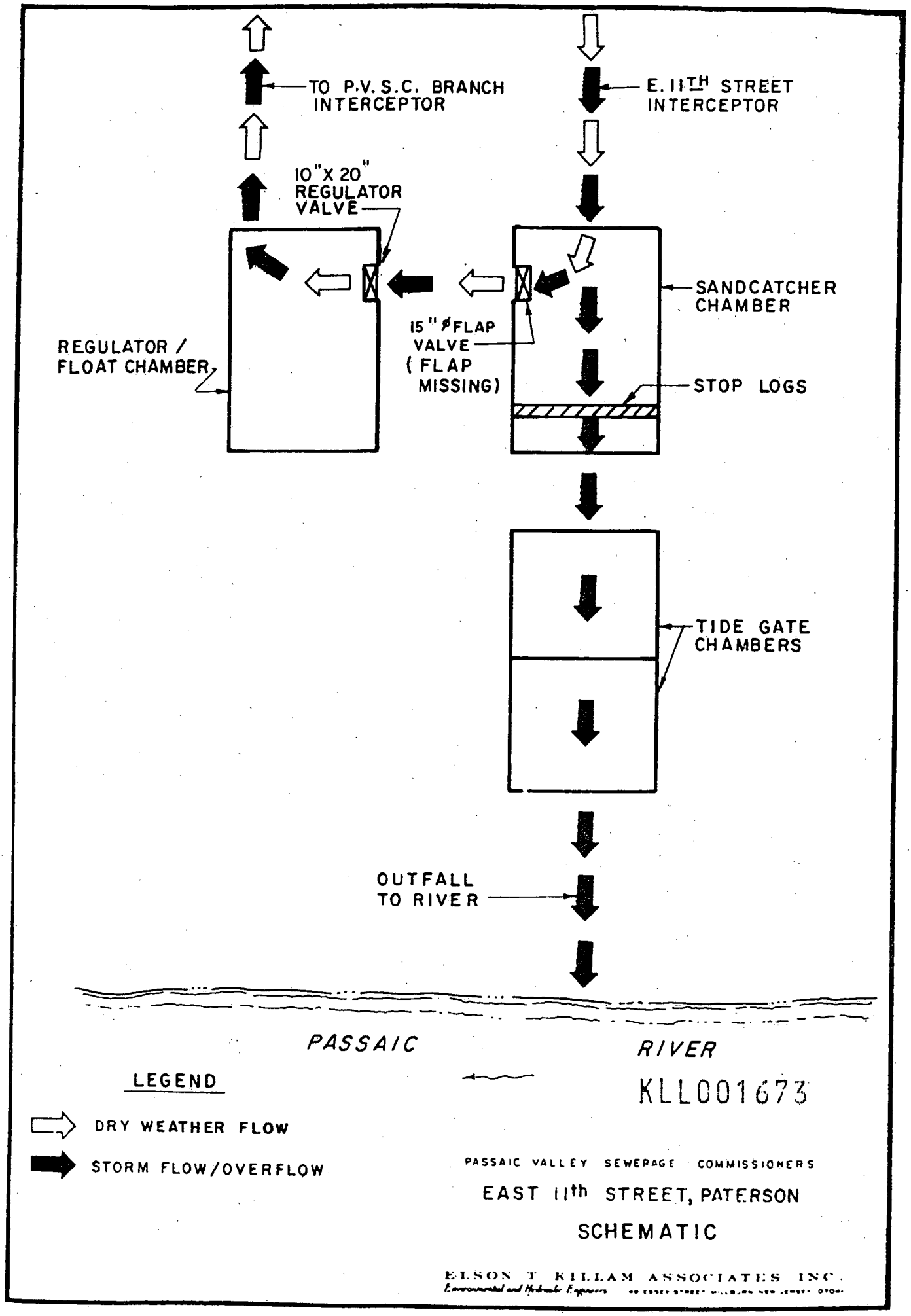
EAST 11th STREET, PATERSON

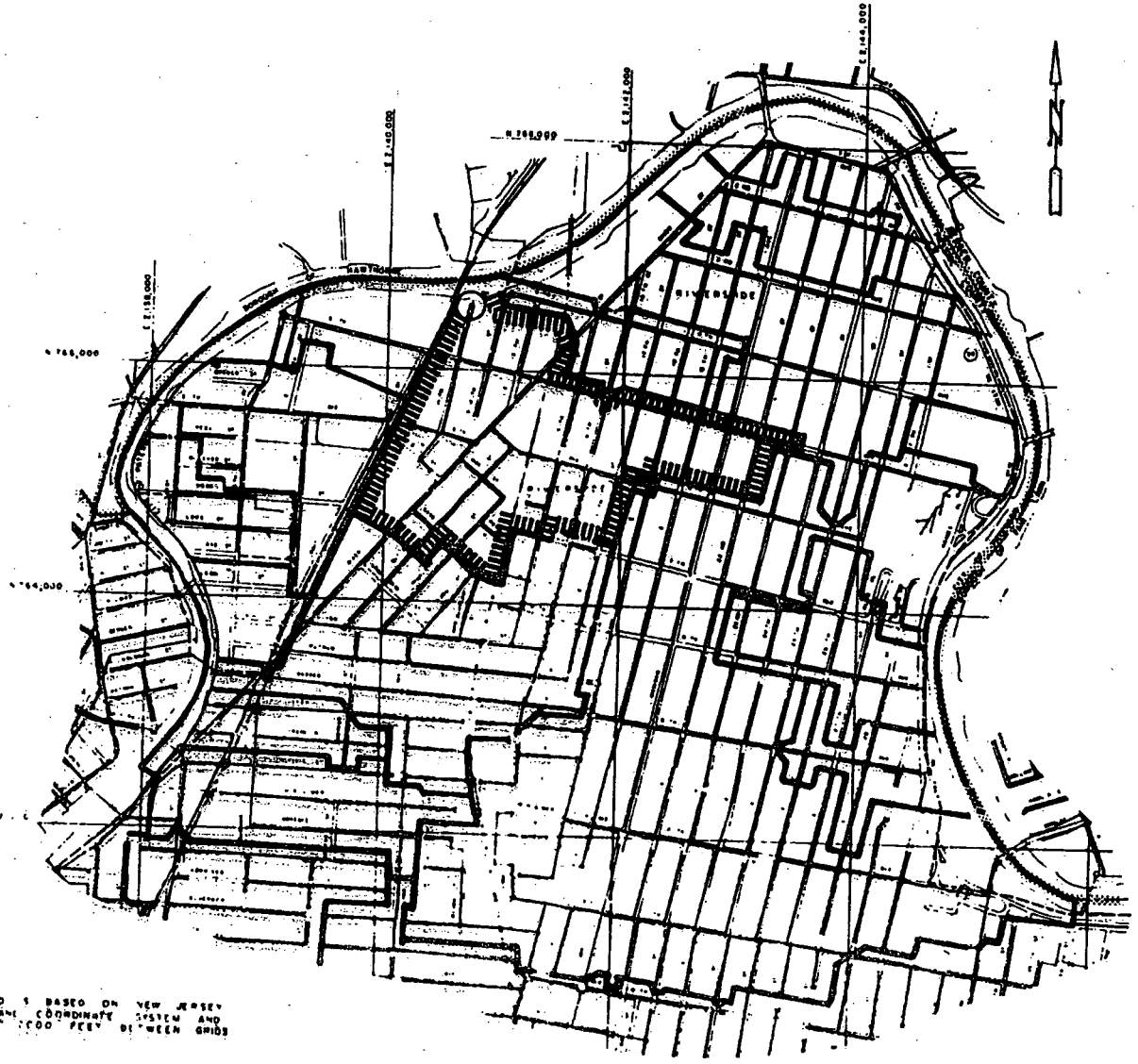
PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC

PLATE D

KLLC01674


TO P.V.S.C. BRANCH INTERCEPTOR
E. 11TH STREET INTERCEPTOR
10"X 20" REGULATOR VALVE
SANDCATCHER CHAMBER
15" ø FLAP VALVE (FLAP MISSING)
REGULATOR / FLOAT CHAMBER
STOP LOGS
TIDE GATE CHAMBERS
OUTFALL TO RIVER
PASSAIC RIVER
LEGEND
DRY WEATHER FLOW
STORM FLOW/OVERFLOW
KLL001673
PASSAIC VALLEY SEWERAGE COMMISSIONERS
EAST 11th STREET, PATERSON
SCHEMATIC
ELSON T. KILLAM ASSOCIATES INC.
Environmental and Hydraulic Engineers



LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- EAST 11th STREET OVERFLOW CHAMBER
- EAST 11th STREET COLLECTION SYSTEM

SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

EAST 11th STREET, PATERSON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC

PLATE D

KLLC01674

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC RIVER OVERFLOWS

EAST 12th ST. & 4th AVE., PATERSON
P-014

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

KLL001675

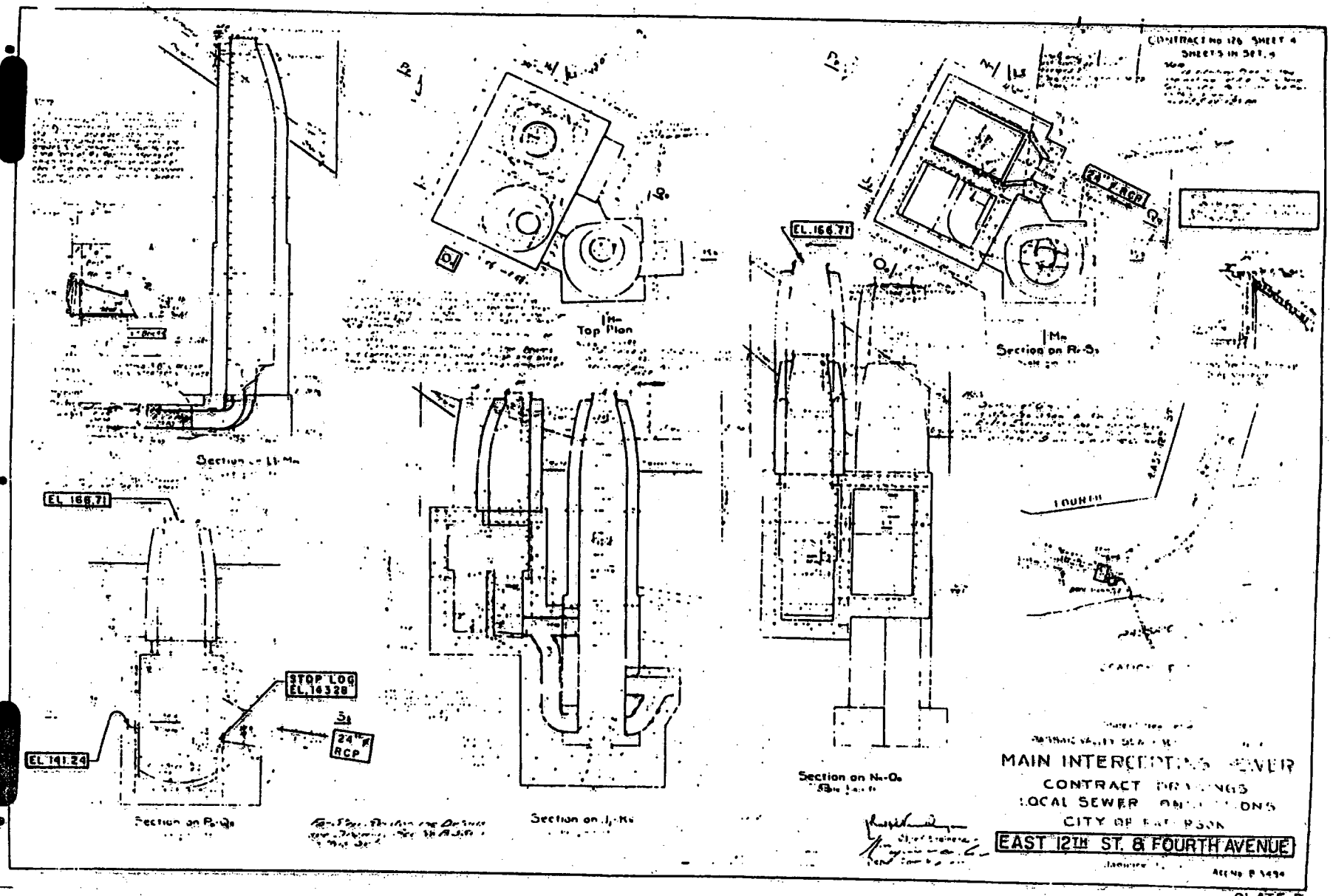
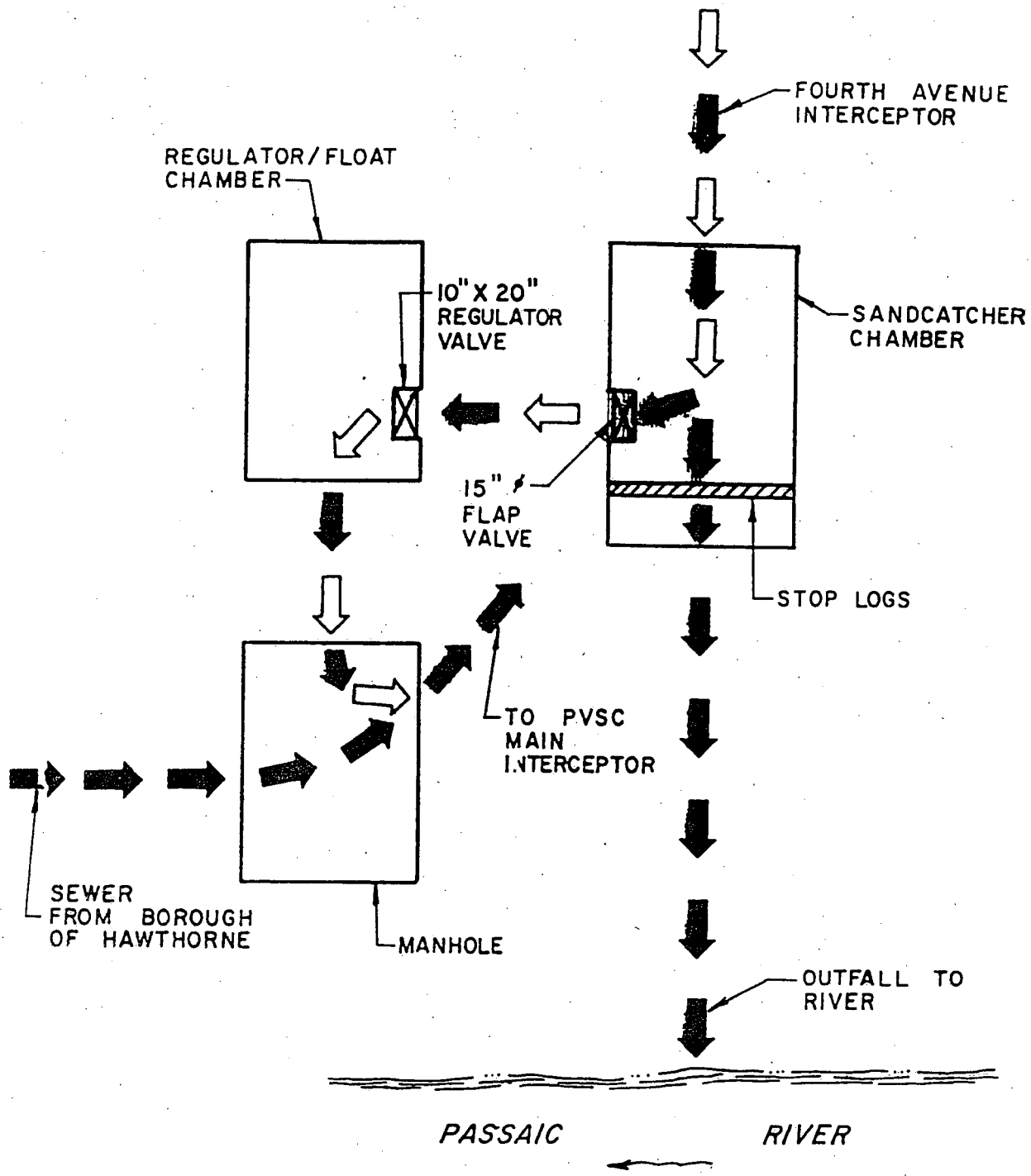


PLATE B

(3)

KLLC01677



KLL001678

LEGEND

DRY WEATHER FLOW

STORM FLOW / OVERFLOW

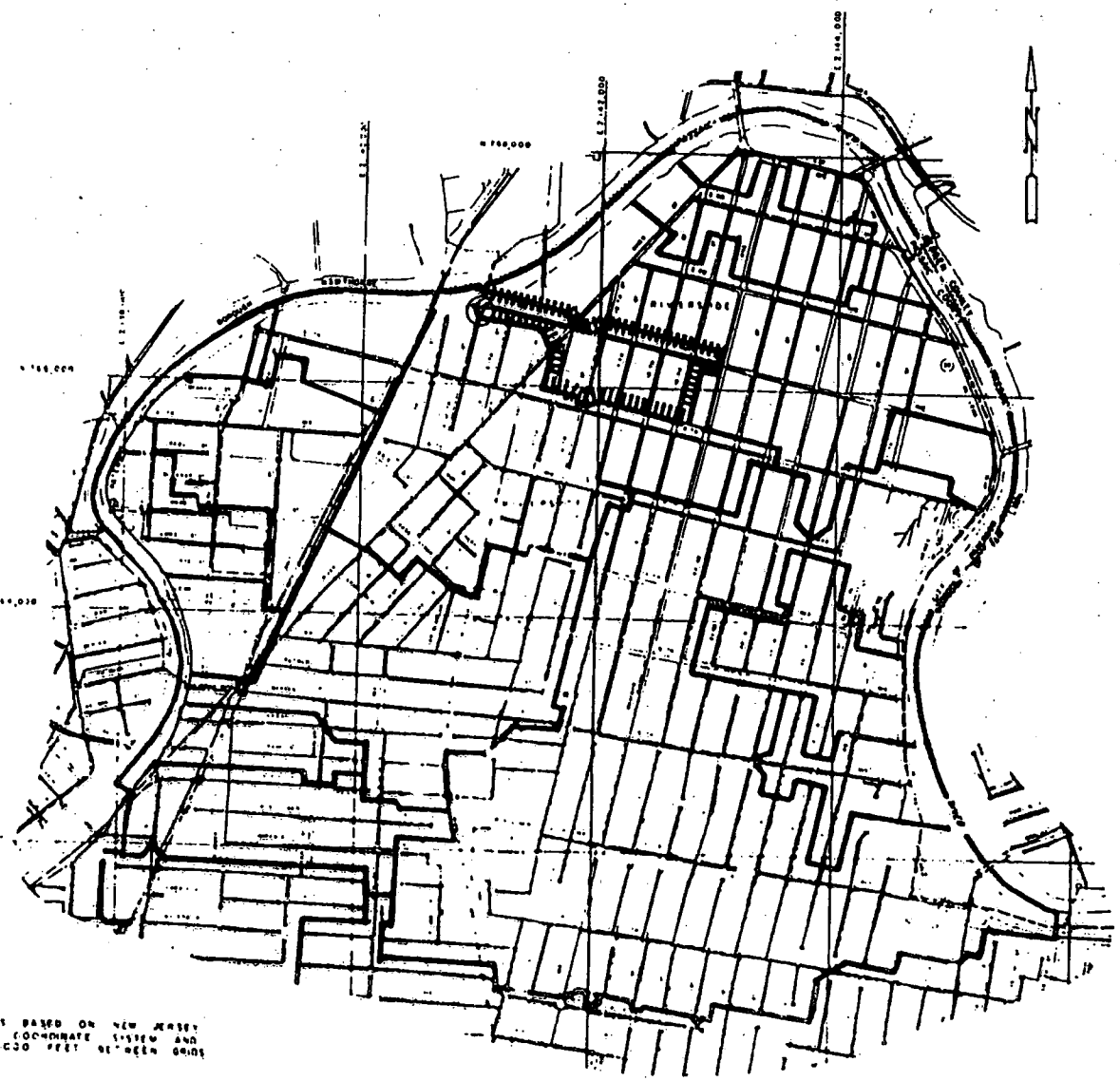
PASSAIC VALLEY SEWERAGE COMMISSIONERS

E. 12TH ST. & 4TH AVE., PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

PLATE C



LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- EAST 12th STREET & 4th AVENUE OVERFLOW CHAMBER
- EAST 12th STREET & 4th AVENUE COLLECTION SYSTEM

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS EQUAL 2000 FEET BETWEEN GRIDS

SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

EAST 12th STREET & 4th AVENUE, PATERS

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC

PLATE D

KLL001679

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

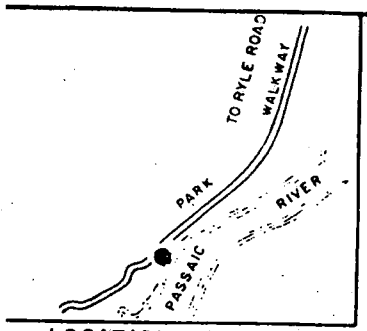
PASSAIC RIVER OVERFLOWS

S.U.M. PARK, PATERSON
P-015

1976

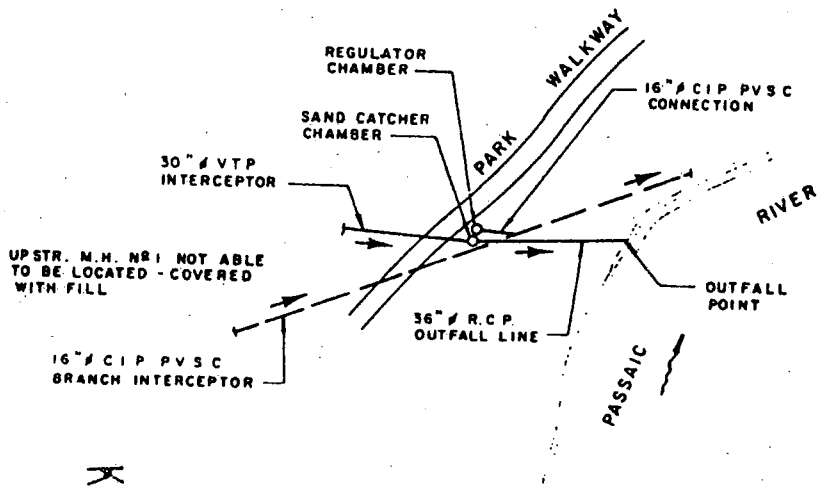
ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 40 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001600



LOCATION PLAN

SCALE IN FEET



PLAN

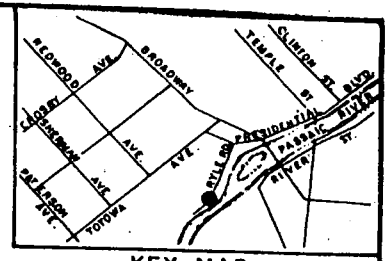
SCALE IN FEET

NOTE

ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

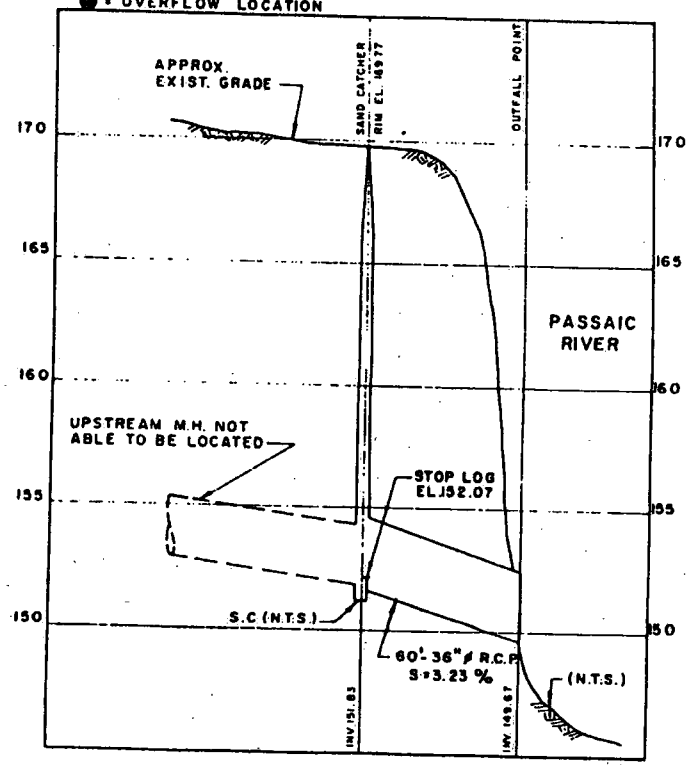
LEGEND

- → DIRECTION OF FLOW
- S.C. = SAND CATCHER
- T. G. = TIDE GATE
- UP STR. = UPSTREAM
- DN. STR. = DOWNSTREAM
- N.T.S. = NOT TO SCALE
- R.C.P. = REINFORCED CONCRETE PIPE
- V.T.P. = VITRIFIED TILE PIPE
- C.I.P. = CAST IRON PIPE
- ● = OVERFLOW LOCATION



KEY MAP

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-015

S.U.M. PARK, PATERSON

PLAN

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

ELEVATIONS BASED ON Nº 67 AS ESTABLISHED BY J. EMILIUS B. ASSOCIATES LOCATION AND DESCRIPTION APPENDIX

KLL001681

PLATE A

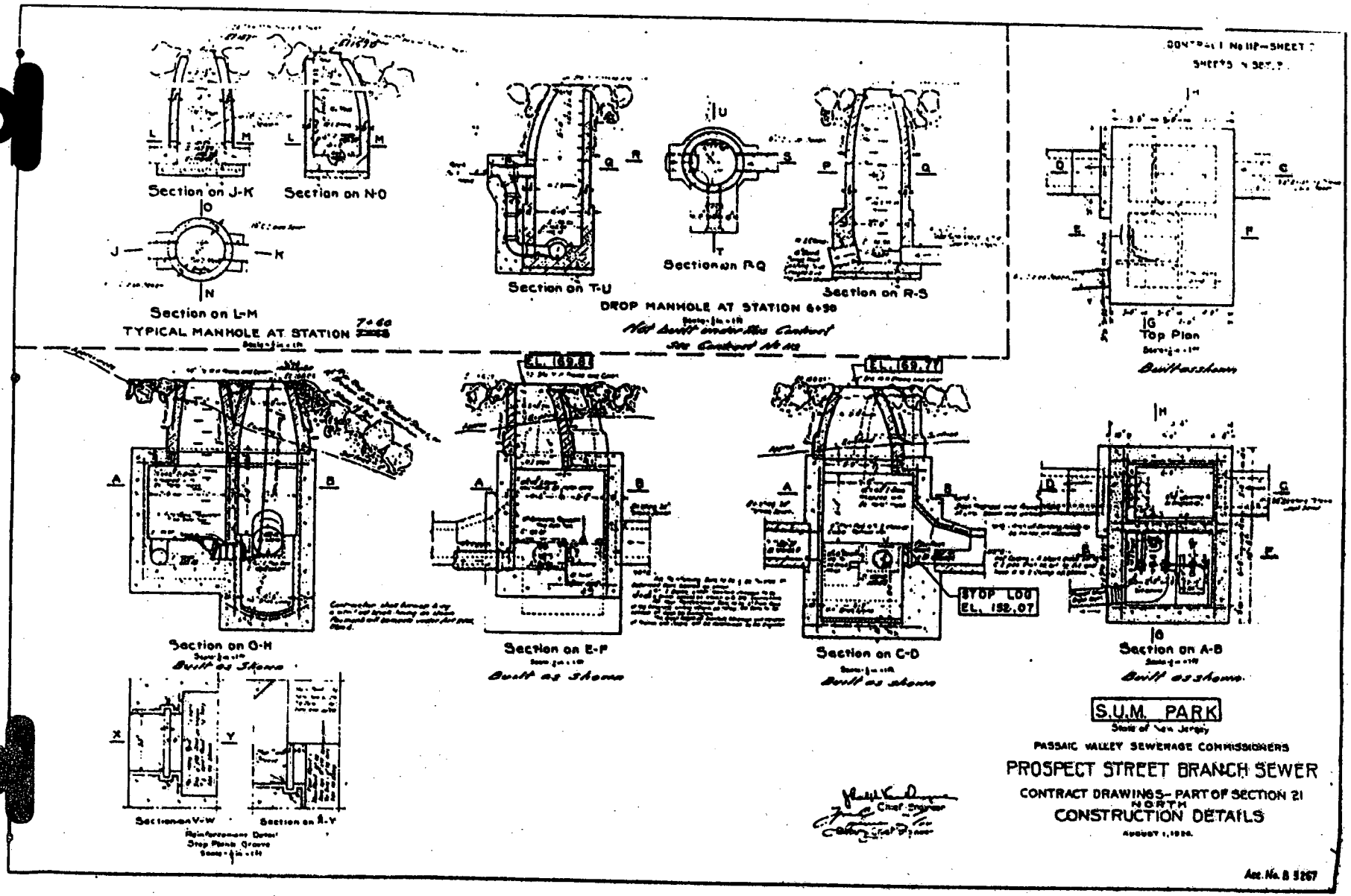
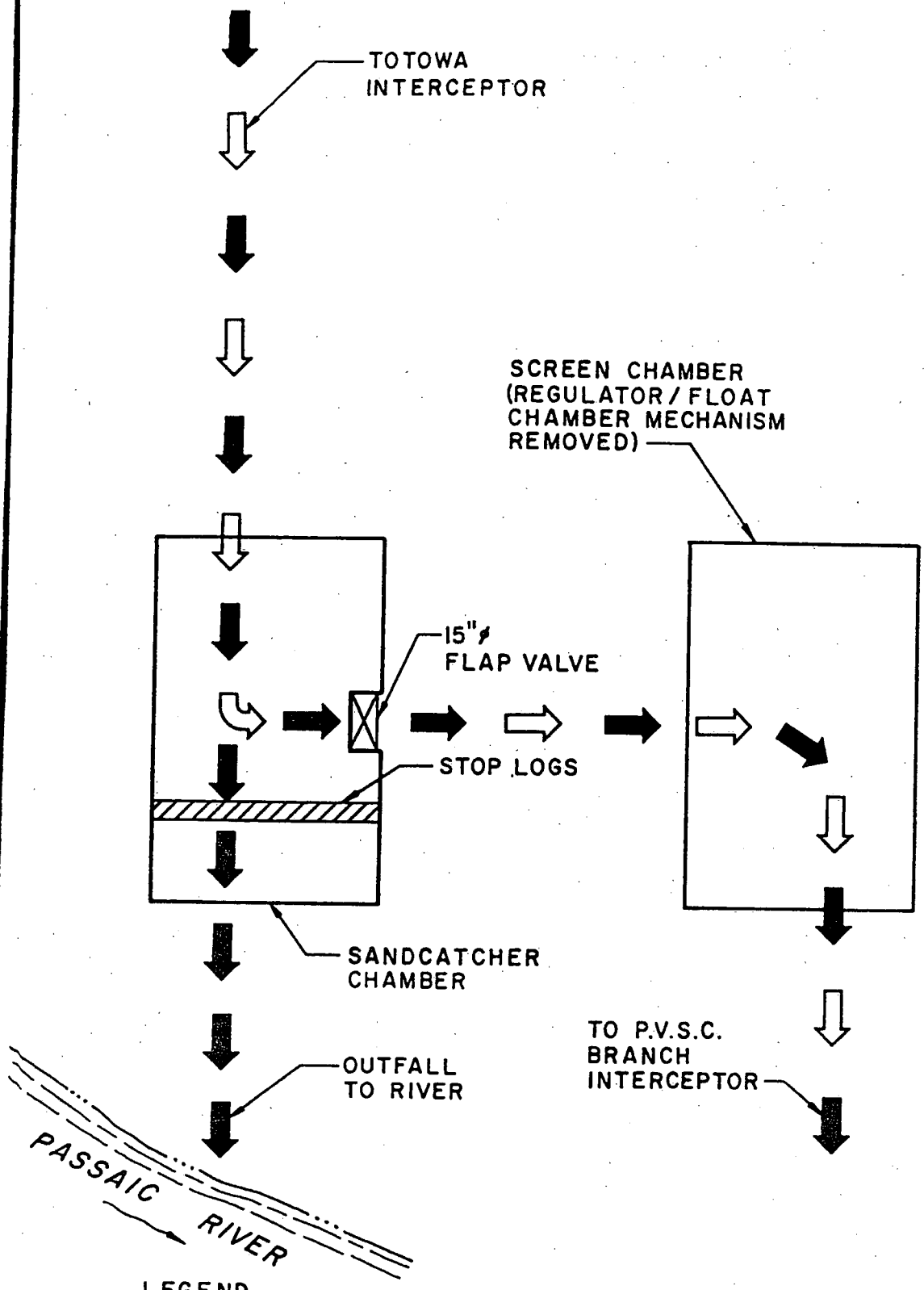


PLATE B

KLLC01682



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001683

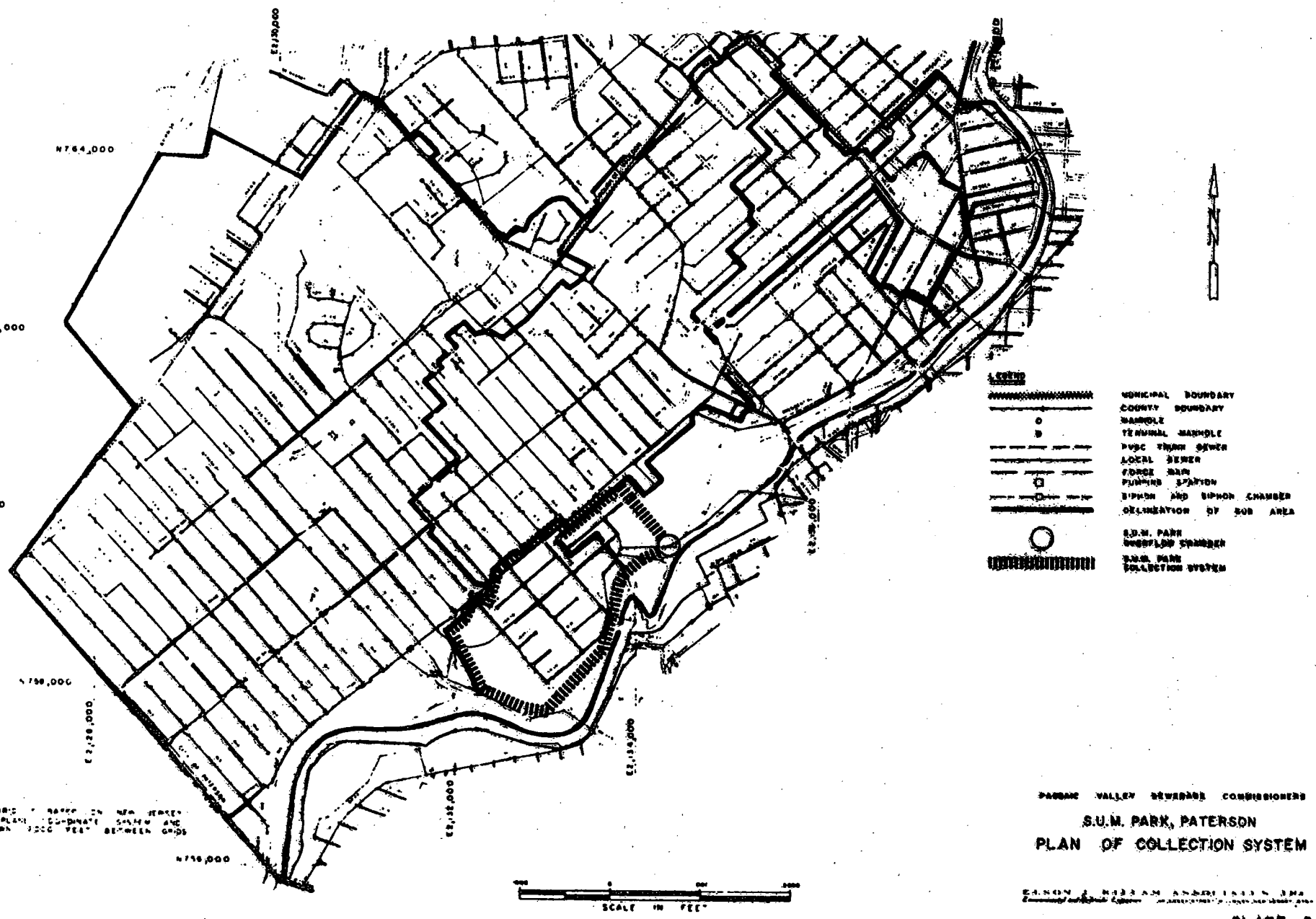
PASSAIC VALLEY SEWERAGE COMMISSIONERS

S.U.M. PARK, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC.
Environmental and Hydraulic Engineers

PLATE C



PASSAIC VALLEY SEWERAGE COMMISSIONERS

S.U.M. PARK, PATERSON

PLAN OF COLLECTION SYSTEM

PLATE D

KLL001684

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC RIVER OVERFLOWS

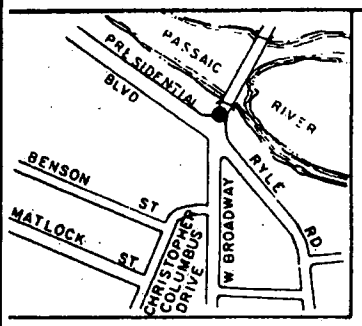
NORTHWEST STREET, PATERSON

P-016

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers
40 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001685



LOCATION PLAN

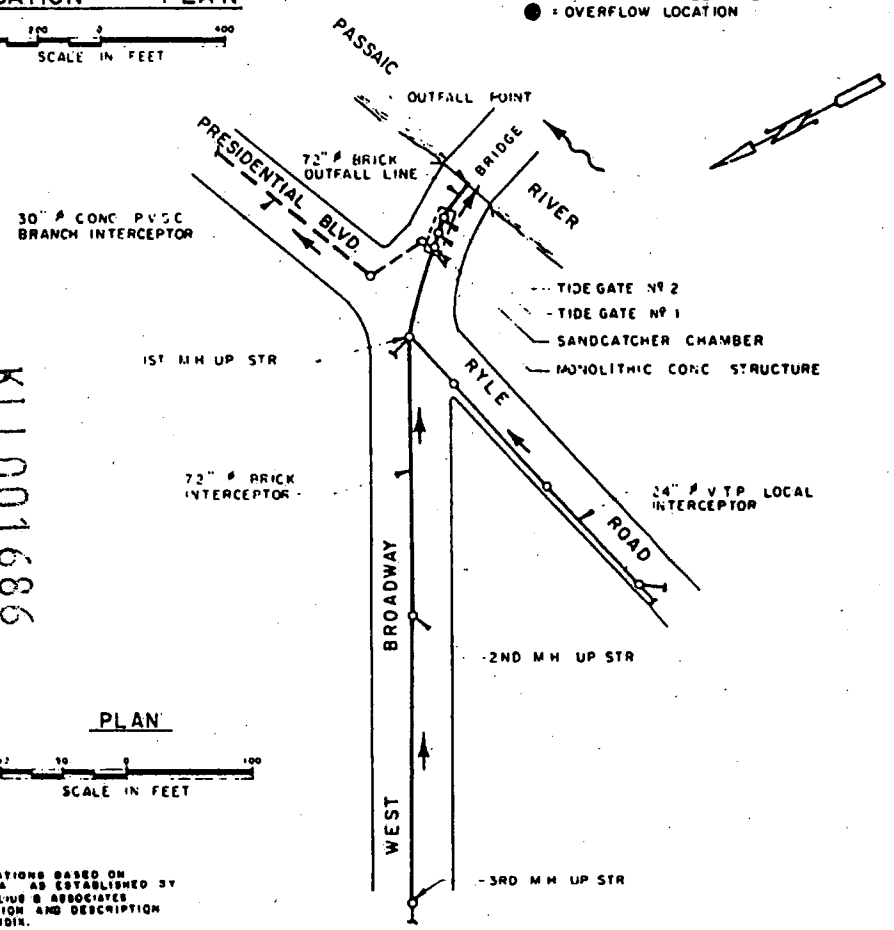
SCALE IN FEET

NOTE:

ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

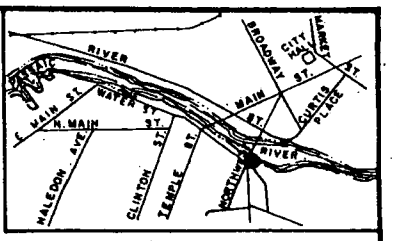
LEGEND:

→ DIRECTION OF FLOW
S.C. : SAND CATCHER
T.G. : TIDE GATE
UP STR : UP STREAM
DN STR. : DOWN STREAM
N.T.S. : NOT TO SCALE
V.T.P. : VITRIFIED TILE PIPE
● : OVERFLOW LOCATION



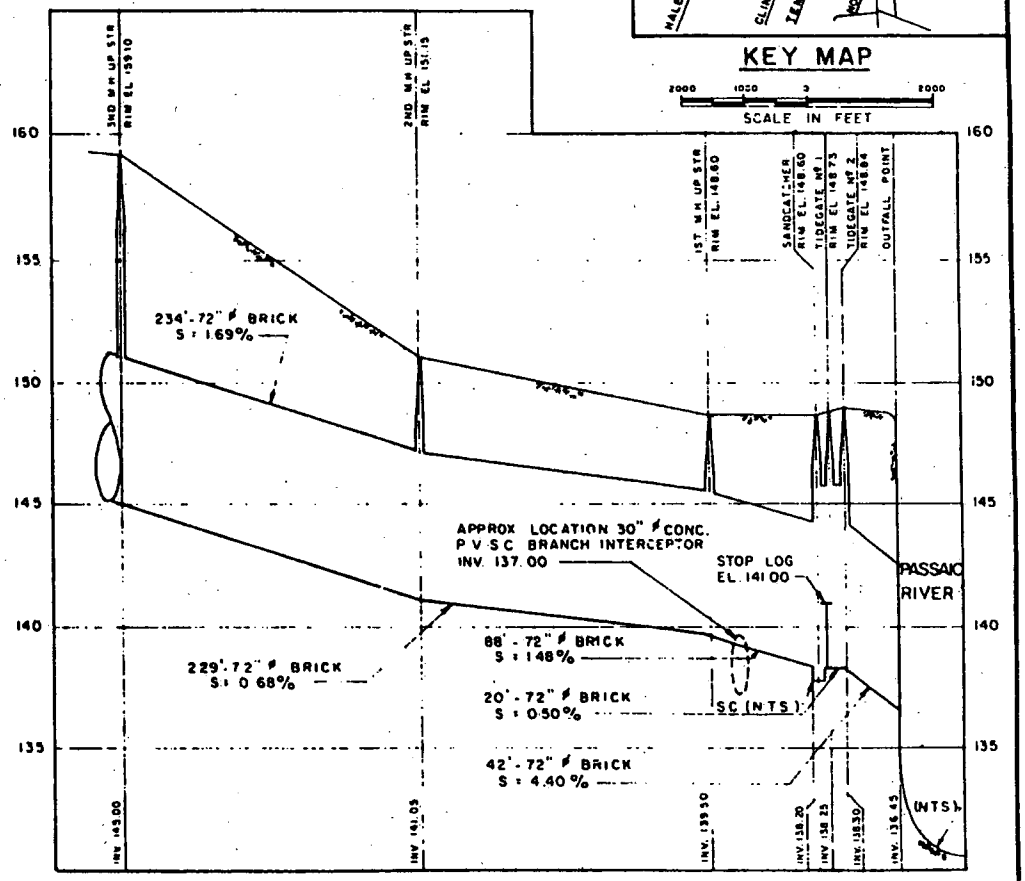
PLAN

SCALE IN FEET



KEY MAP

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-016

NORTHWEST STREET, PATERSON

PLAN AND PROFILE

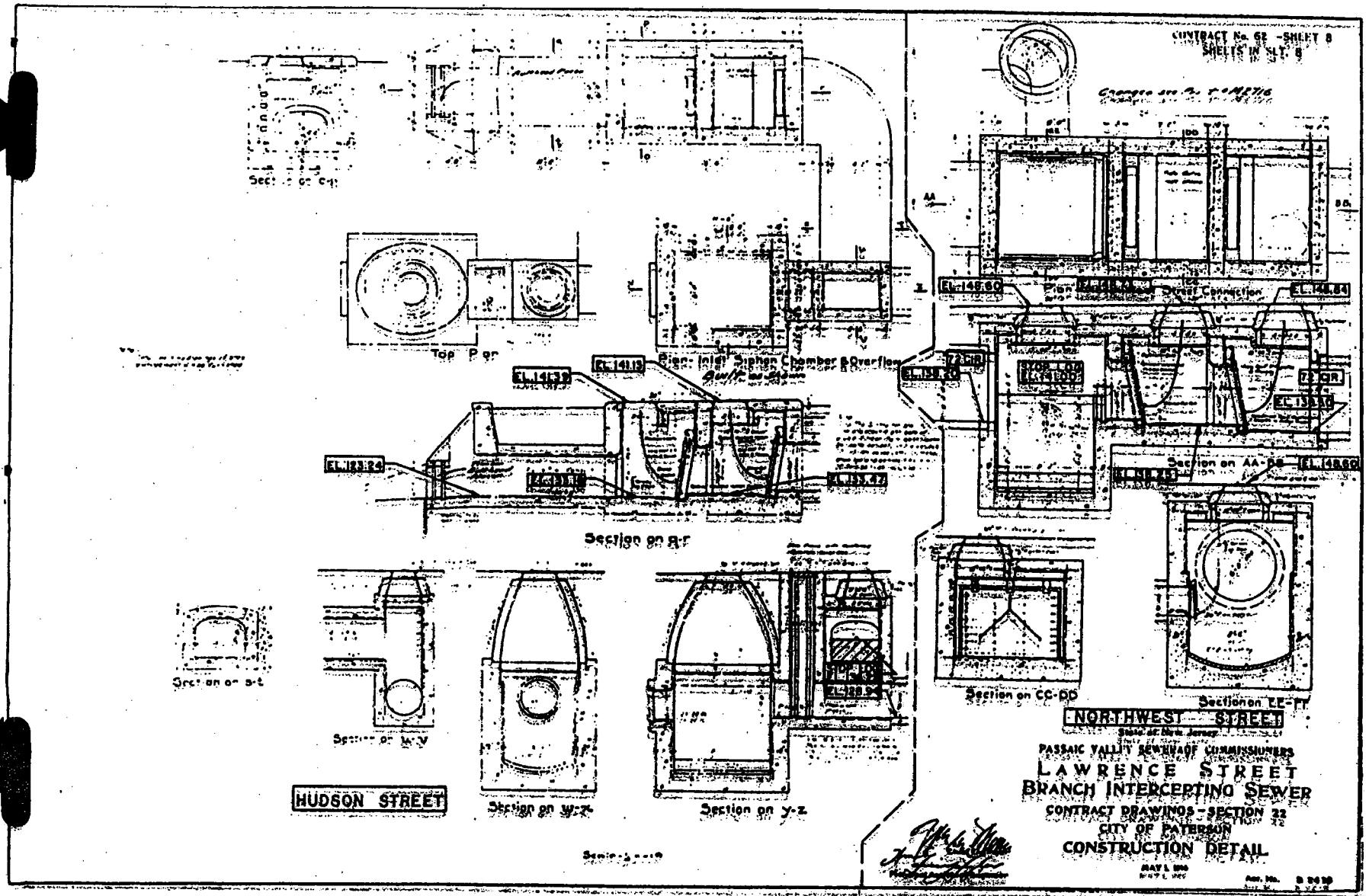
ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

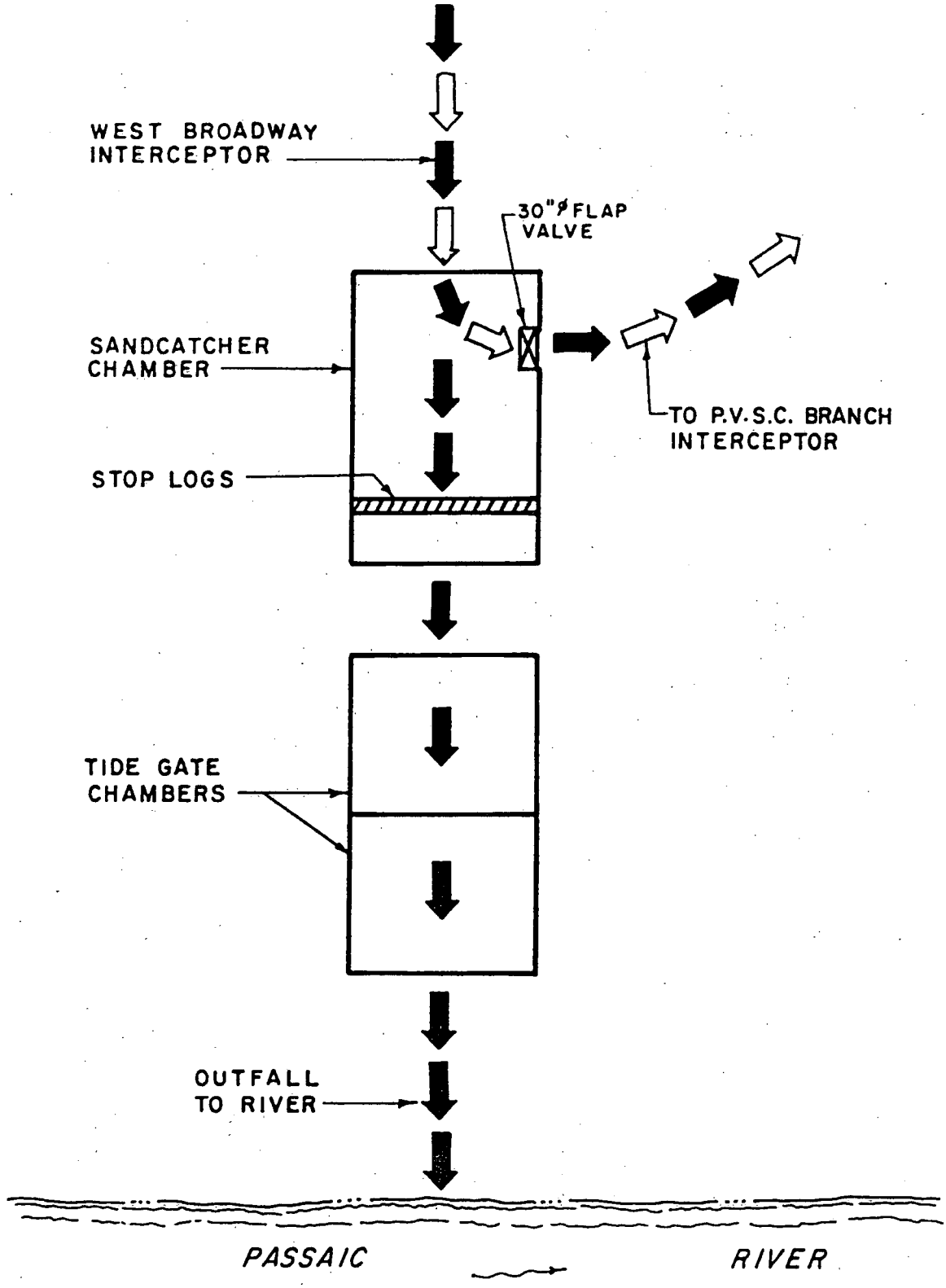
...L ELEVATIONS BASED ON ...M. Nº 11A AS ESTABLISHED BY ...AUL J. EMKLUB & ASSOCIATES ...OR LOCATION AND DESCRIPTION ...EE APPENDIX.

KLL001686

PLATE A


CONTRACT No. 62 - SHEET 8
SHEETS IN SET 8
Top Plan
Plan - Inlet Siphon Chamber & Overflow
Section on g-r
Section on s-t
Section on w-v
Section on w-x
Section on y-z
Section on CC-DD
Section on EE-FF
Section on AA-BB
EL. 148.60
EL. 148.84
EL. 141.13
EL. 141.39
EL. 123.24
EL. 133.47
EL. 128.94
HUDSON STREET
NORTHWEST STREET
State of New Jersey
PASSAIC VALLEY SEWERAGE COMMISSIONERS
LAWRENCE STREET
BRANCH INTERCEPTING SEWER
CONTRACT DRAWINGS - SECTION 22
CITY OF PATERSON
CONSTRUCTION DETAIL
PLATE 8

LL001687



LEGEND

DRY WEATHER FLOW

STORM FLOW / OVERFLOW

KLL001688

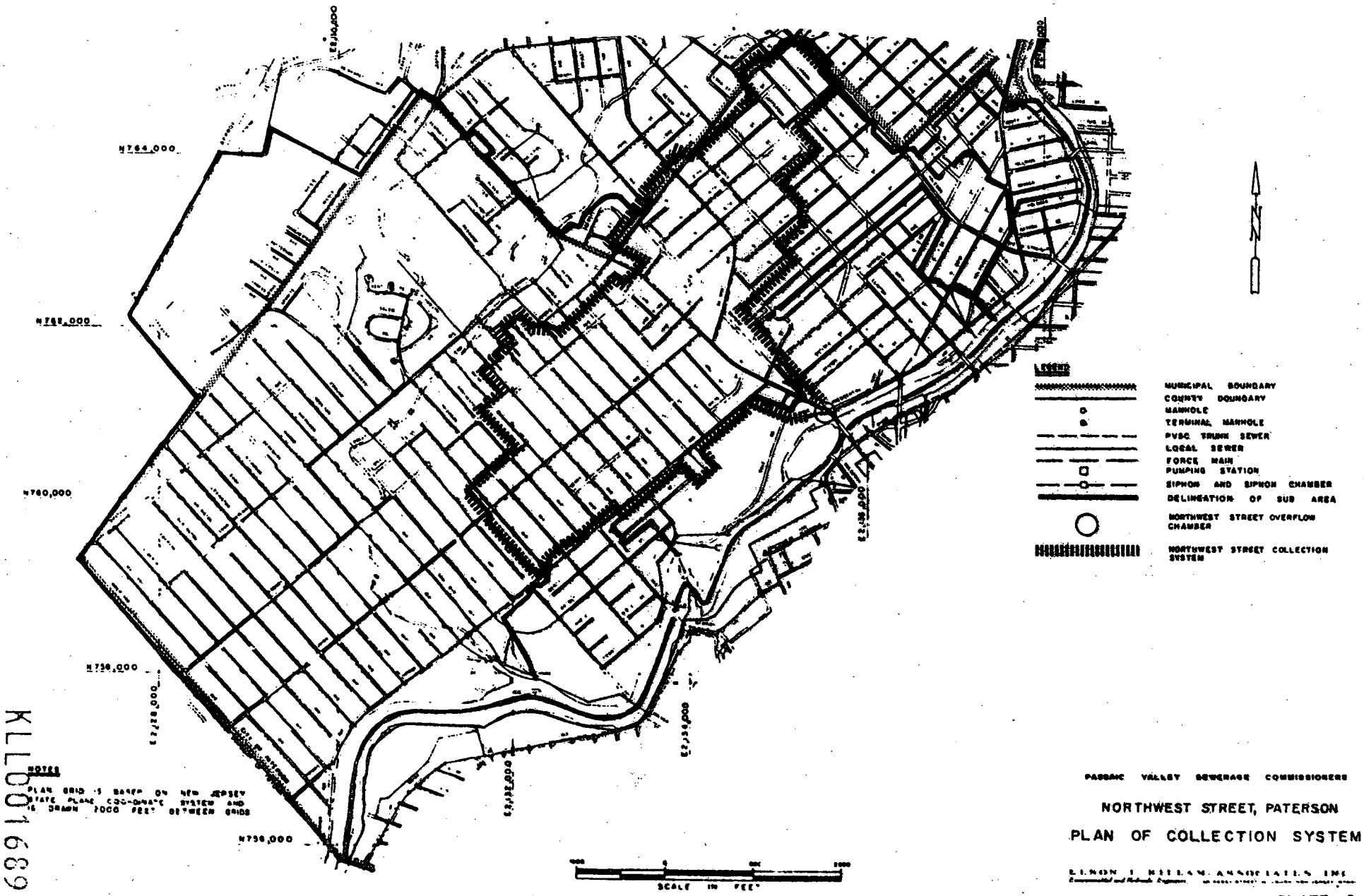
PASSAIC VALLEY SEWERAGE COMMISSIONERS

NORTHWEST STREET, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE C



PASSAIC VALLEY SEWERAGE COMMISSIONERS

NORTHWEST STREET, PATERSON

PLAN OF COLLECTION SYSTEM

ELMON T. HILLARD ASSOCIATES, INC.

PLATE D

KLL001689

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

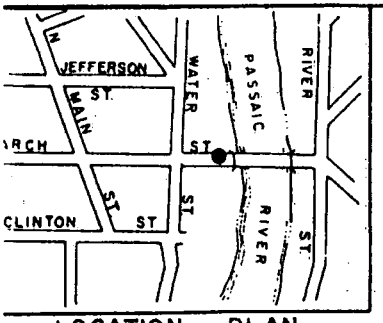
PASSAIC RIVER OVERFLOWS

ARCH STREET, PATERSON
P-017

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 40 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001690



LOCATION PLAN

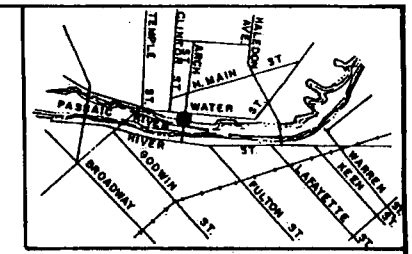
SCALE IN FEET

NOTE

ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

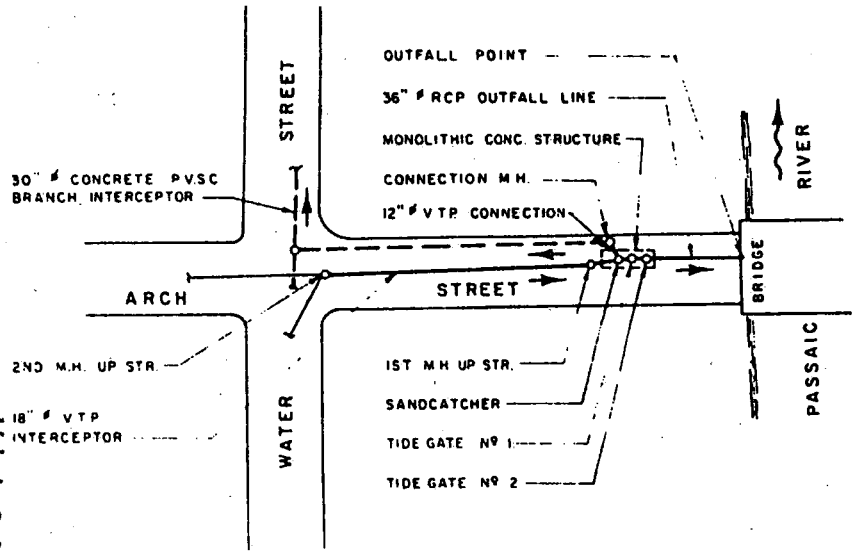
LEGEND:

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
R.C.P. = REINFORCED CONCRETE PIPE
● = OVERFLOW LOCATION



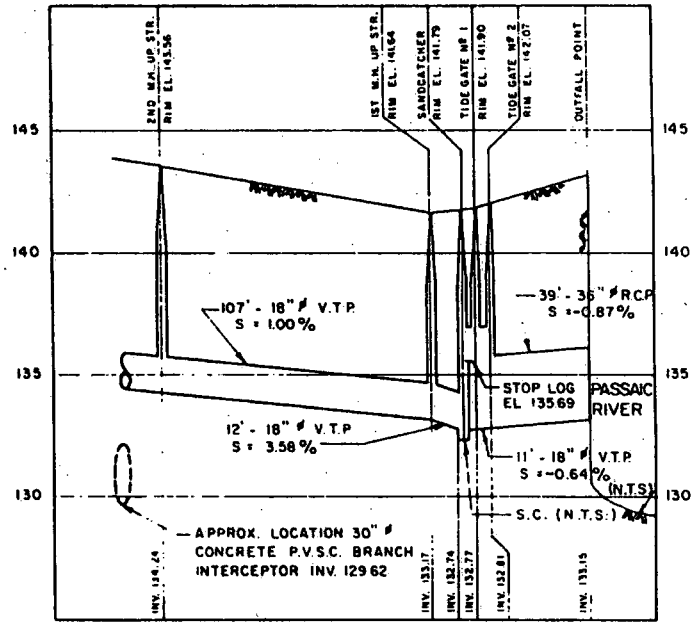
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

KLL001691

ALL ELEVATIONS BASED ON B.M. NO. 8A AS ESTABLISHED BY PAUL J. EMILIUS & ASSOCIATES FOR LOCATION AND DESCRIPTION SEE APPENDIX

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-017

ARCH STREET, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE 1

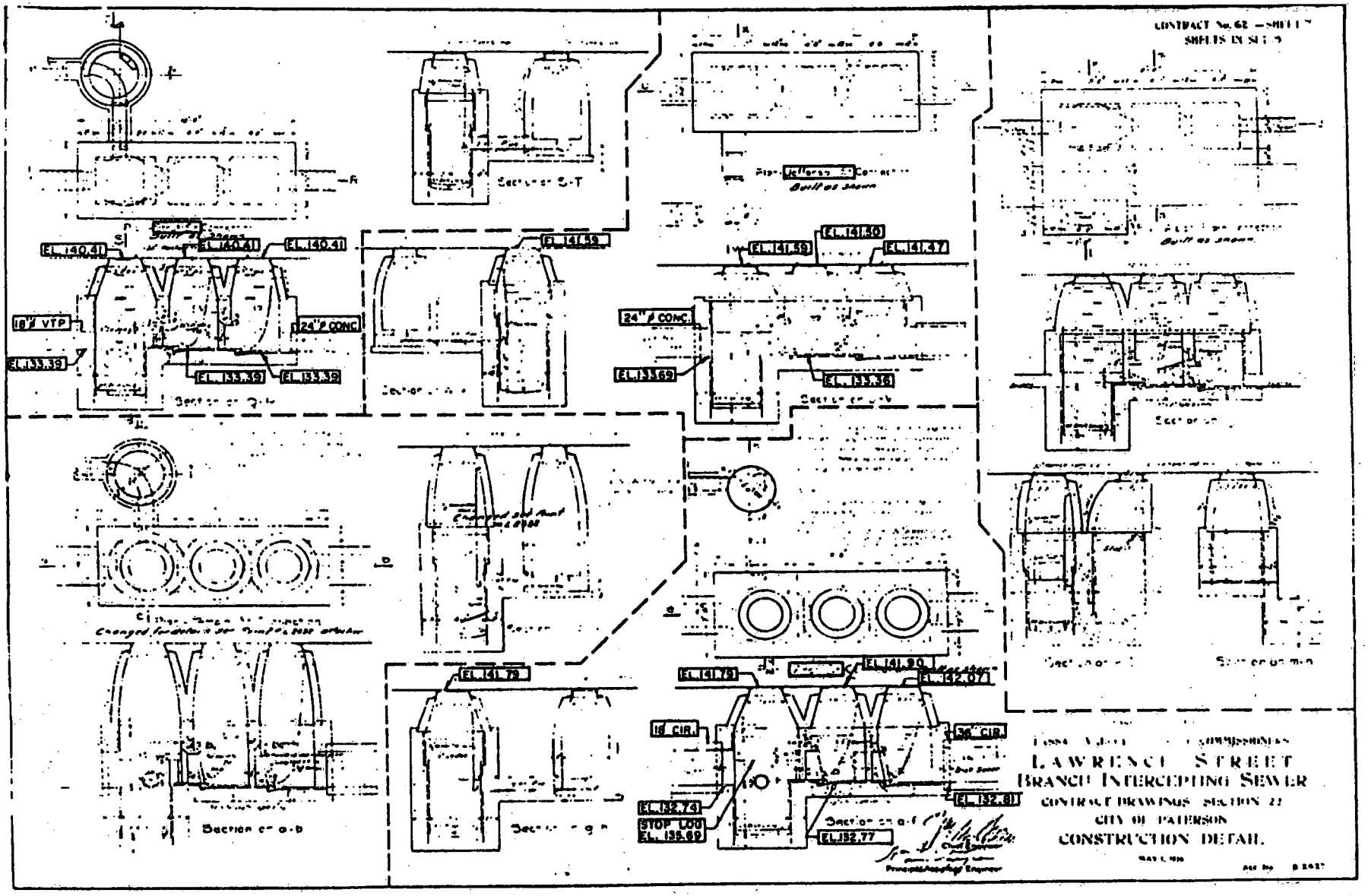
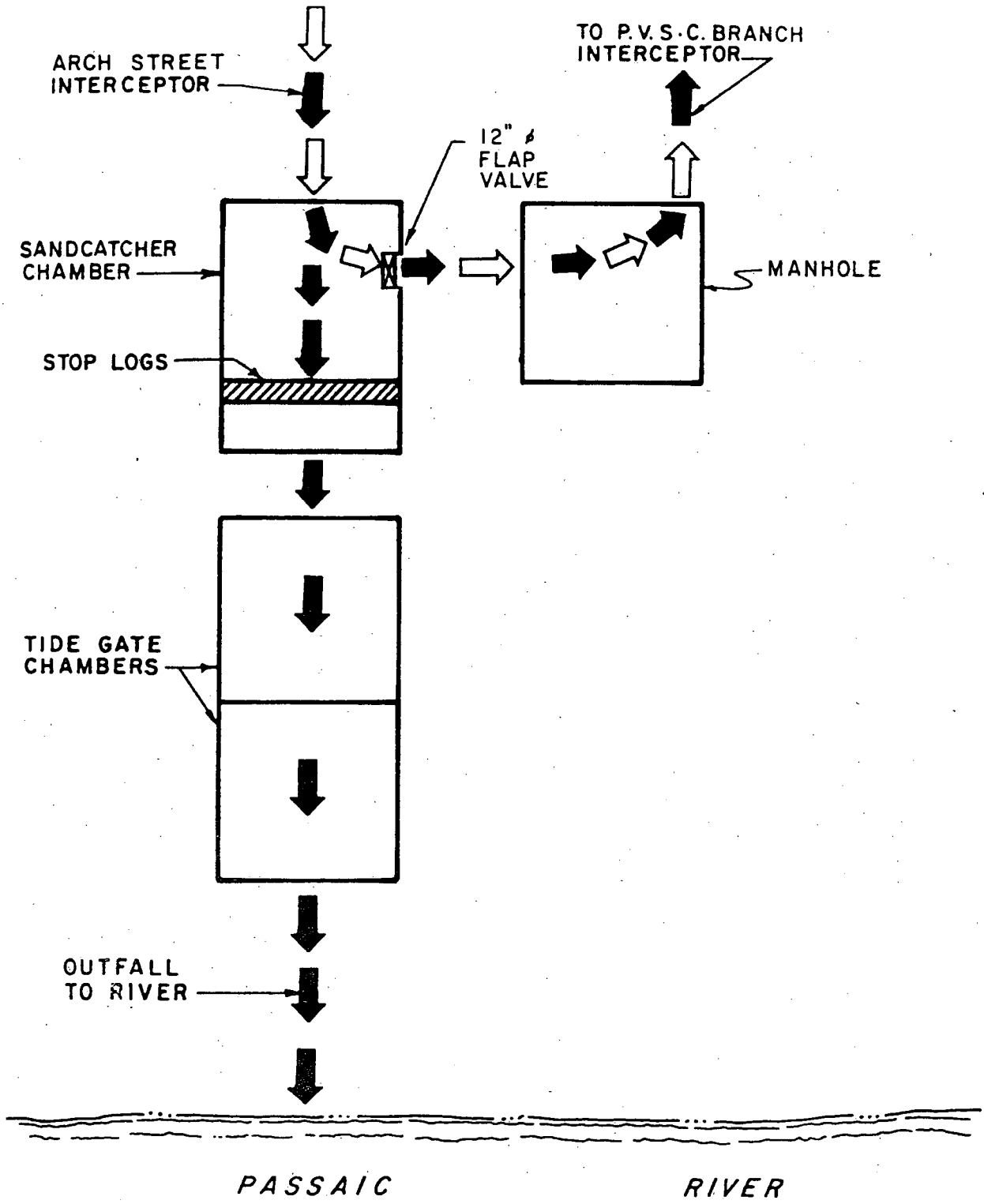


PLATE 8

(3)

KLL001622



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001693

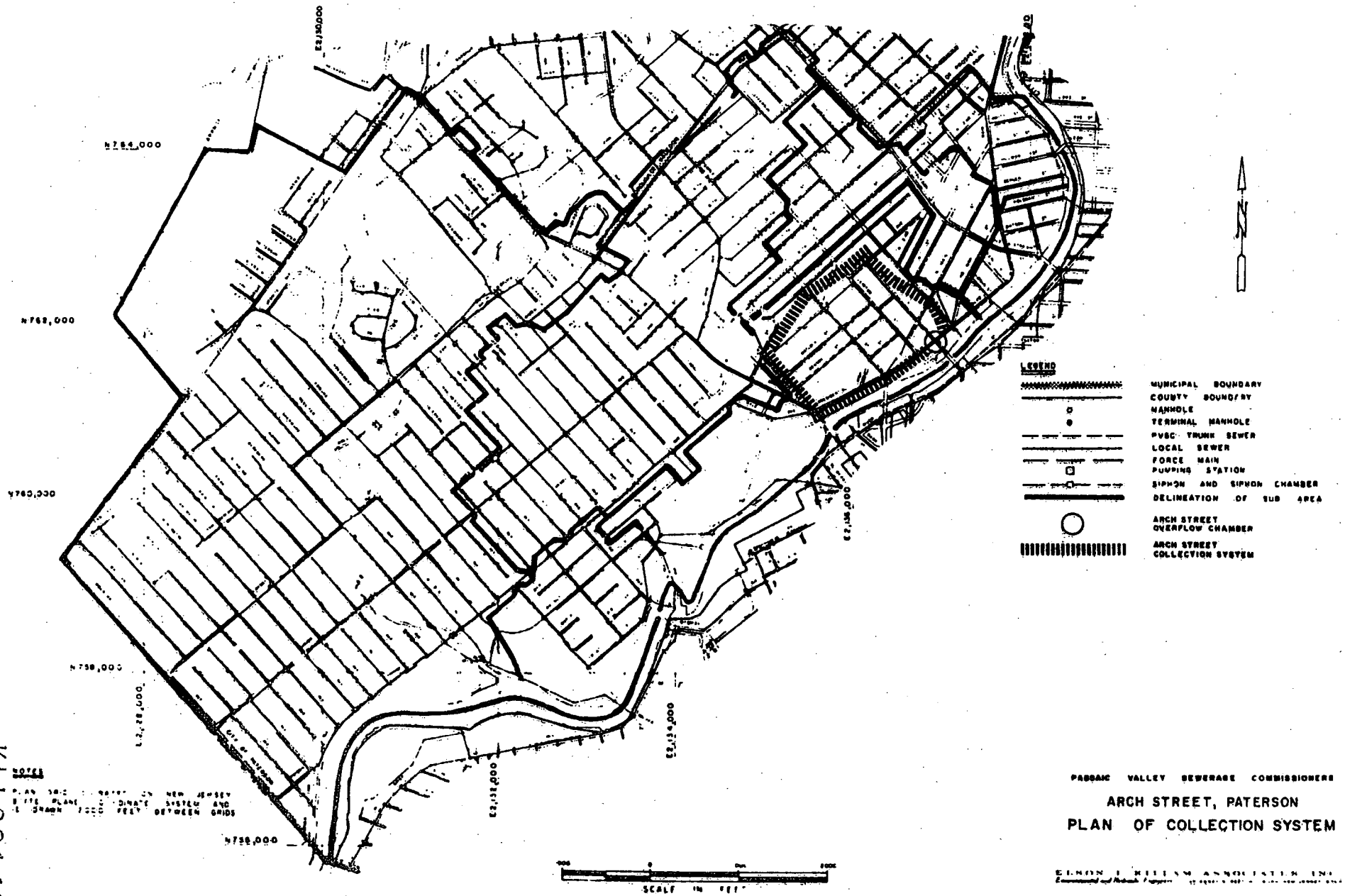
PASSAIC VALLEY SEWERAGE COMMISSIONERS

ARCH STREET, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers



NOTES

PLAN GRID [illegible] ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS

PASSAIC VALLEY SEWERAGE COMMISSIONERS

ARCH STREET, PATERSON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE D

KLL001694

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC RIVER OVERFLOWS

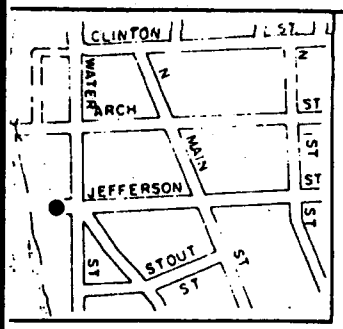
JEFFERSON STREET, PATERSON

P-018

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers
[illegible] ESSEX STREET MILLBURN NEW JERSEY 07041

KLL00160[illegible]



LOCATION PLAN

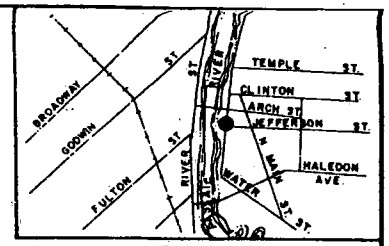
SCALE IN FEET

NOTE

ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

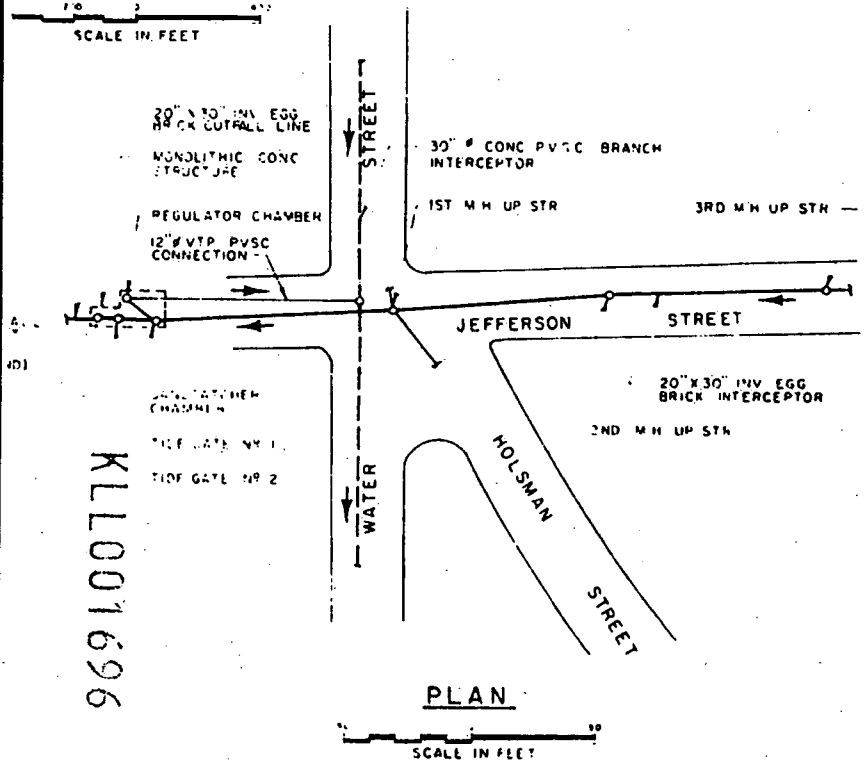
LEGEND

→ DIRECTION OF FLOW
SC : SAND CATCHER
TG : TIDE GATE
UP STR : UP STREAM
DN STR : DOWN STREAM
NTS : NOT TO SCALE
VTP : VITRIFIED TILE PIPE
UNK : UNKNOWN
● : OVERFLOW LOCATION



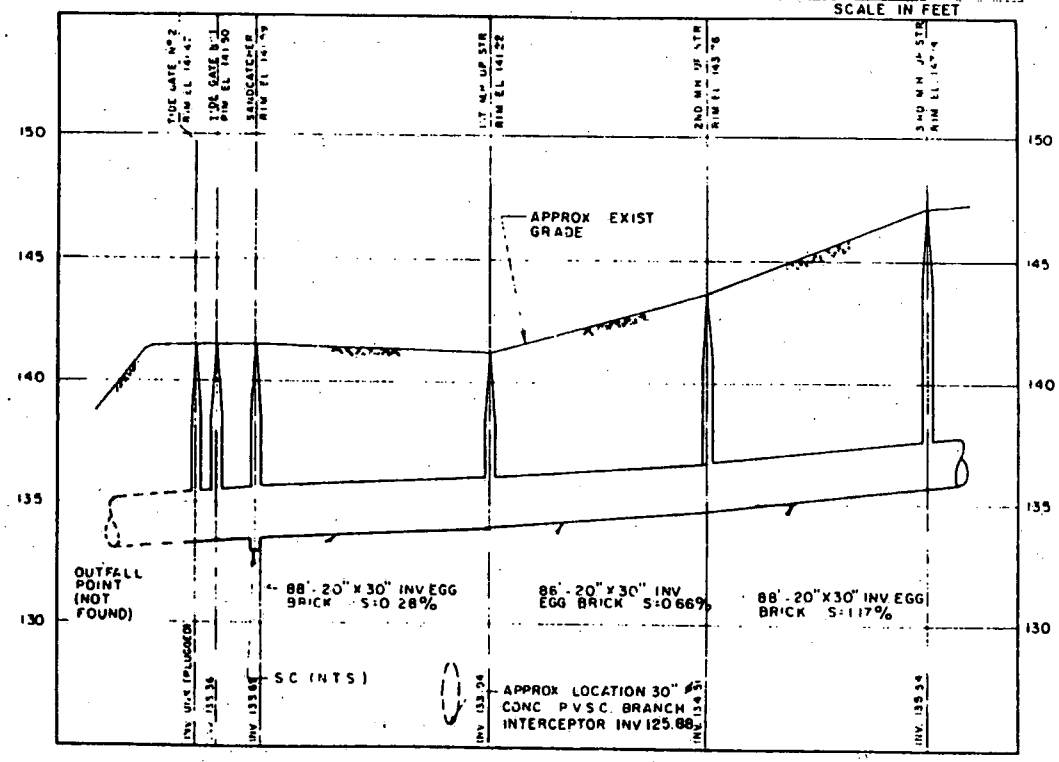
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ SCALE IN FEET

VERT SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-018

JEFFERSON STREET, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

ALL ELEVATIONS BASED ON B.M. NO. ... AS ESTABLISHED BY ... FOR LOCATION AND DESCRIPTION SEE APPENDIX.

KLL001696

PLATE A

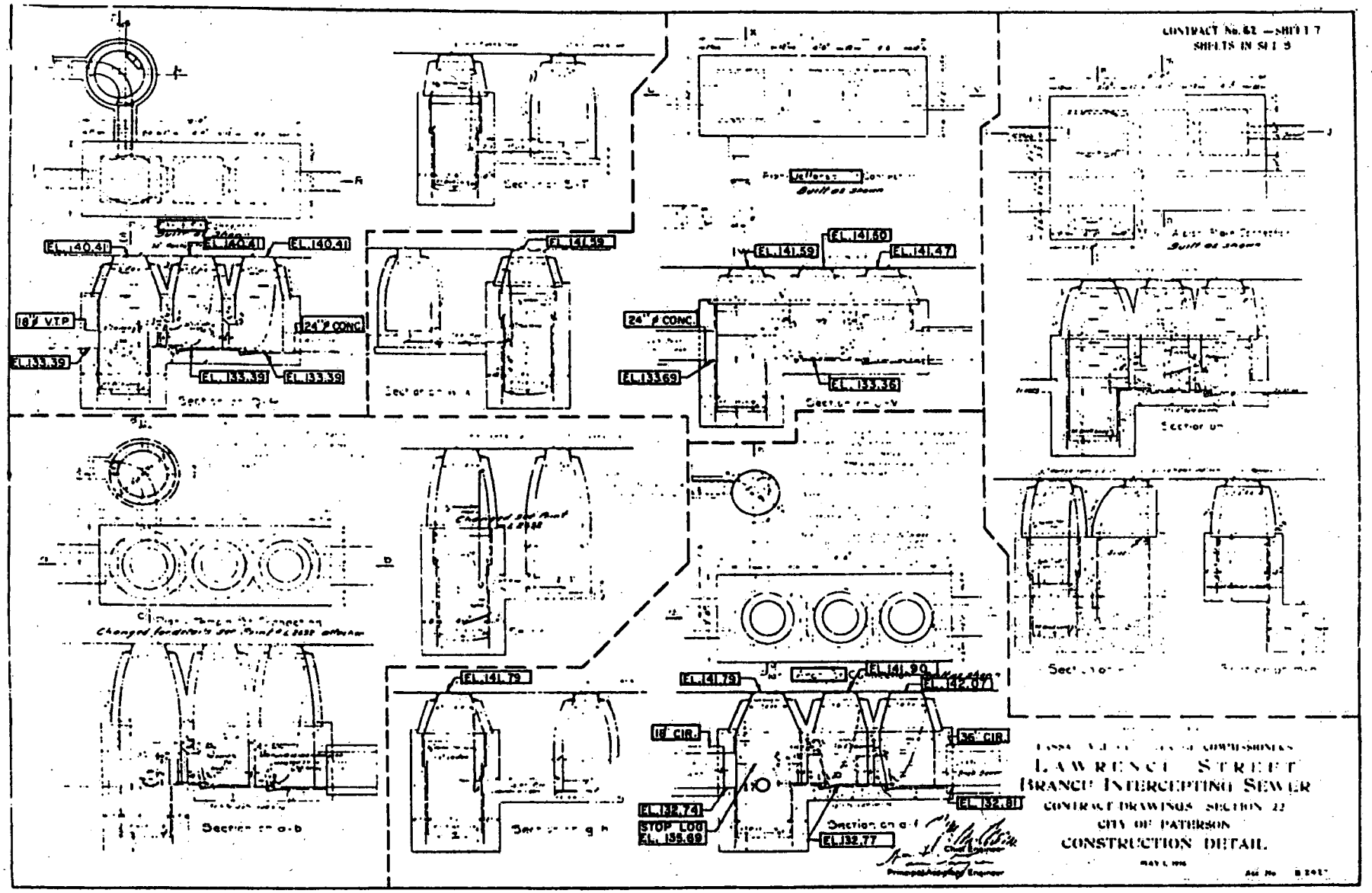
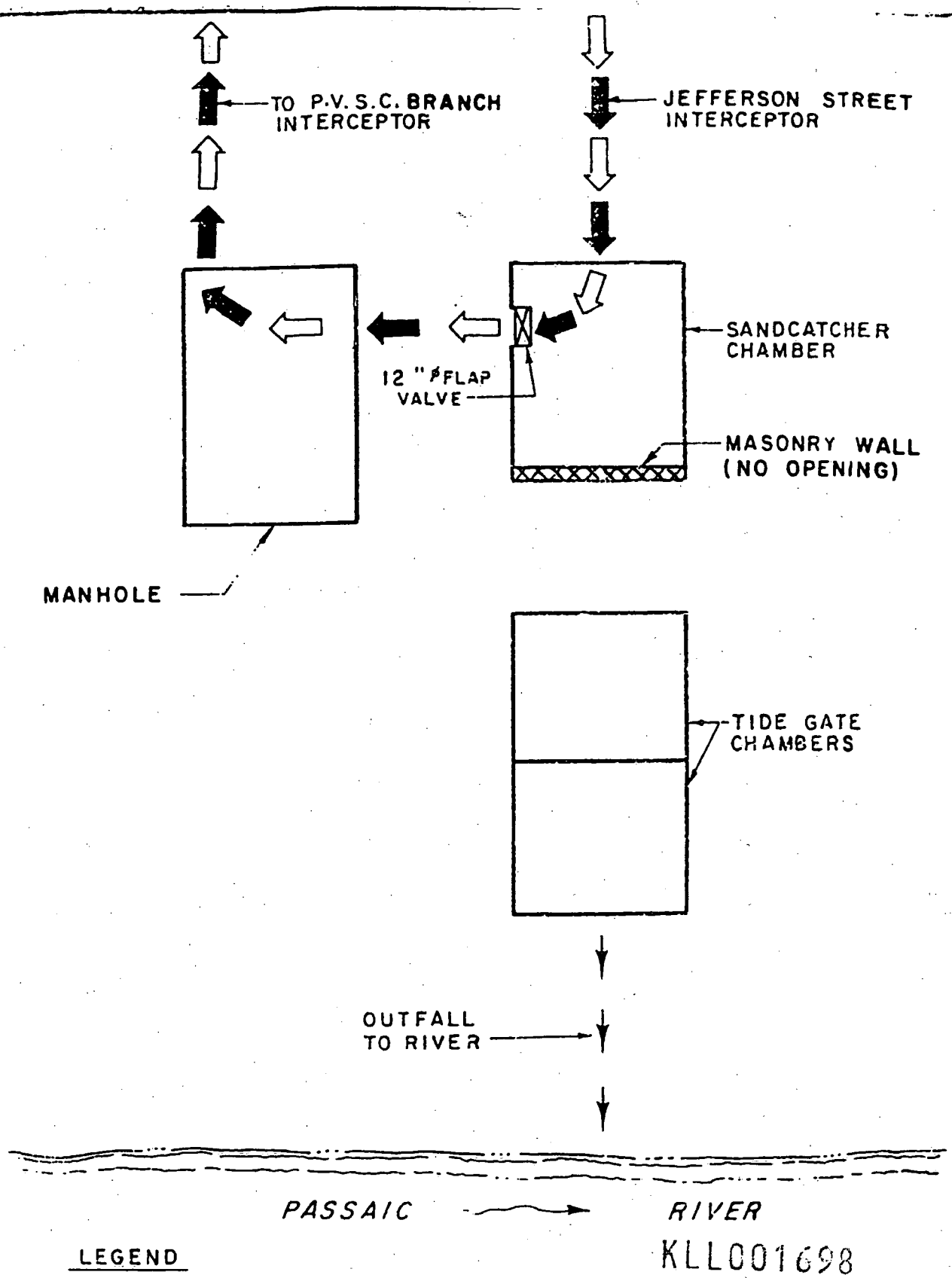


PLATE 8

(3)

KLL001697



KLL001698

LEGEND

DRY WEATHER FLOW

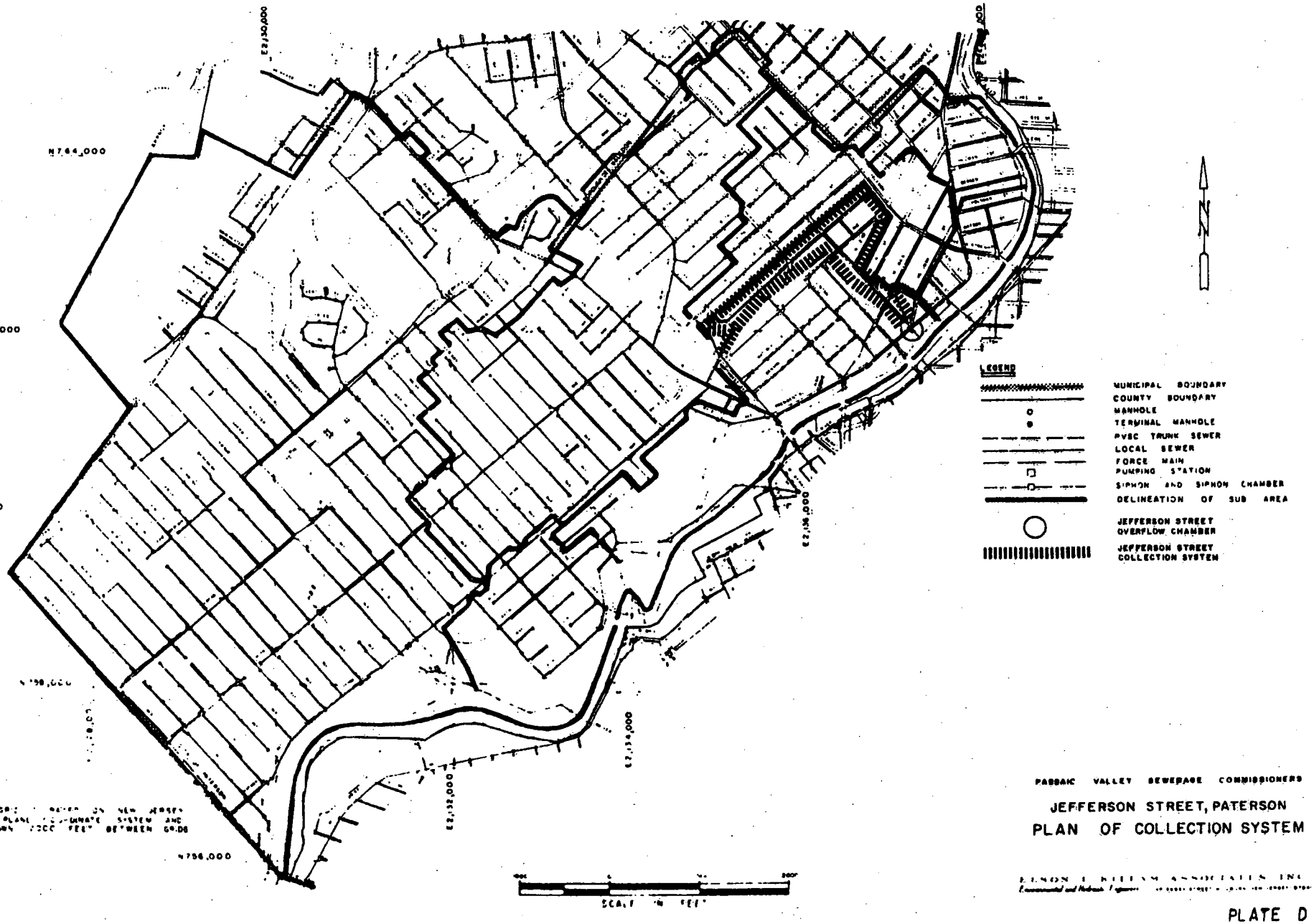
STORM FLOW/OVERFLOW

PASSAIC VALLEY SEWERAGE COMMISSIONERS

JEFFERSON STREET, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.



NOTES

PASSAIC VALLEY SEWERAGE COMMISSIONERS

JEFFERSON STREET, PATERSON

PLAN OF COLLECTION SYSTEM

PLATE D

KLL001699

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

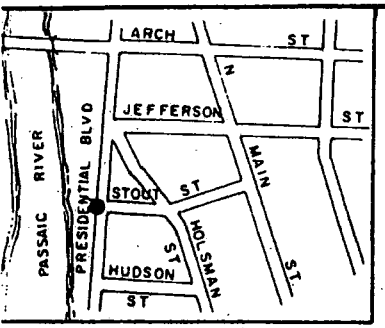
PASSAIC RIVER OVERFLOWS

STOUT STREET, PATERSON
P-019

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

KLL001700



LOCATION PLAN

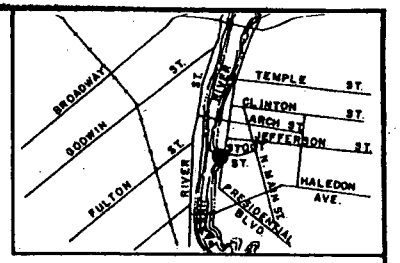
SCALE IN FEET

NOTE:

ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

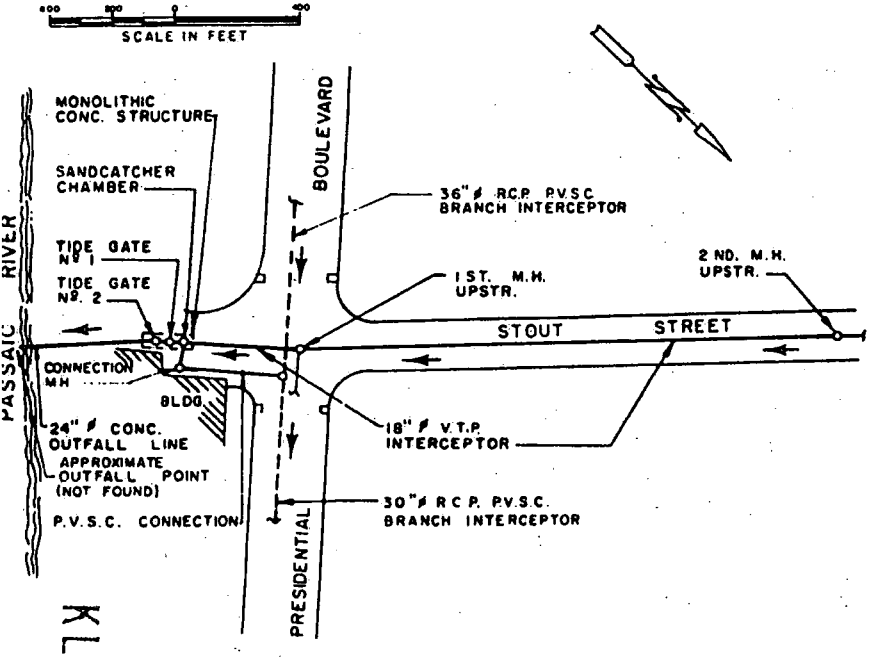
LEGEND:

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
R.C.P. = REINFORCED CONCRETE PIPE
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



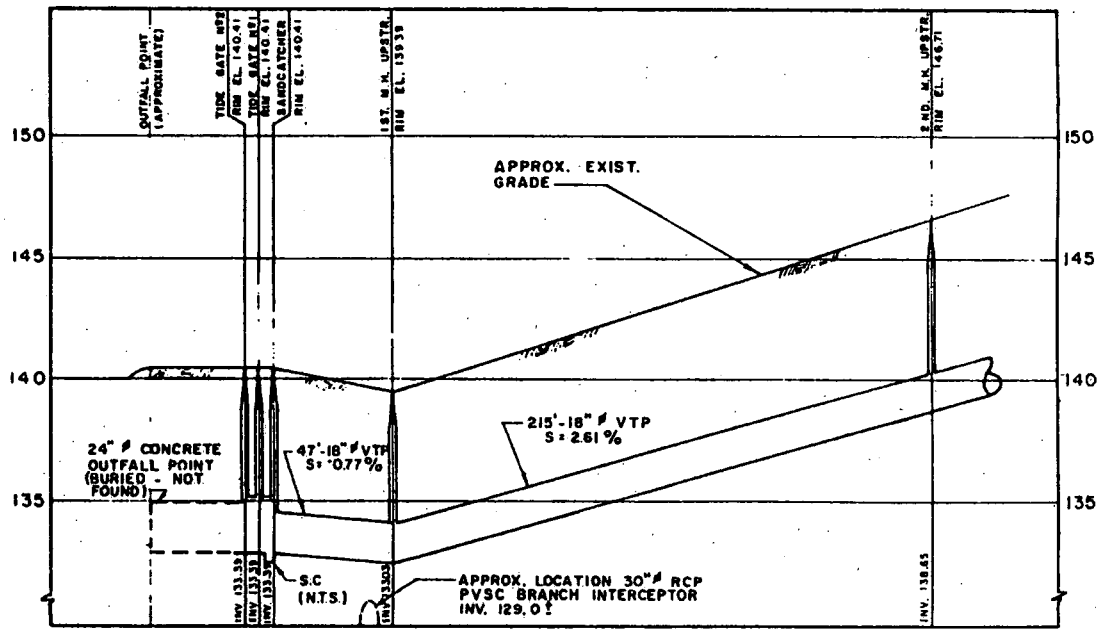
KEY MAP

SCALE IN FEET



PLAN

HORIZ SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-019

STOUT STREET, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Consulting and Hydraulic Engineers

ALL ELEVATIONS BASED ON B.M. Nº 64 AS ESTABLISHED BY PAUL J. EMILIUS & ASSOCIATES FOR LOCATION AND DESCRIPTION SEE APPENDIX

KL100170

PLATE A

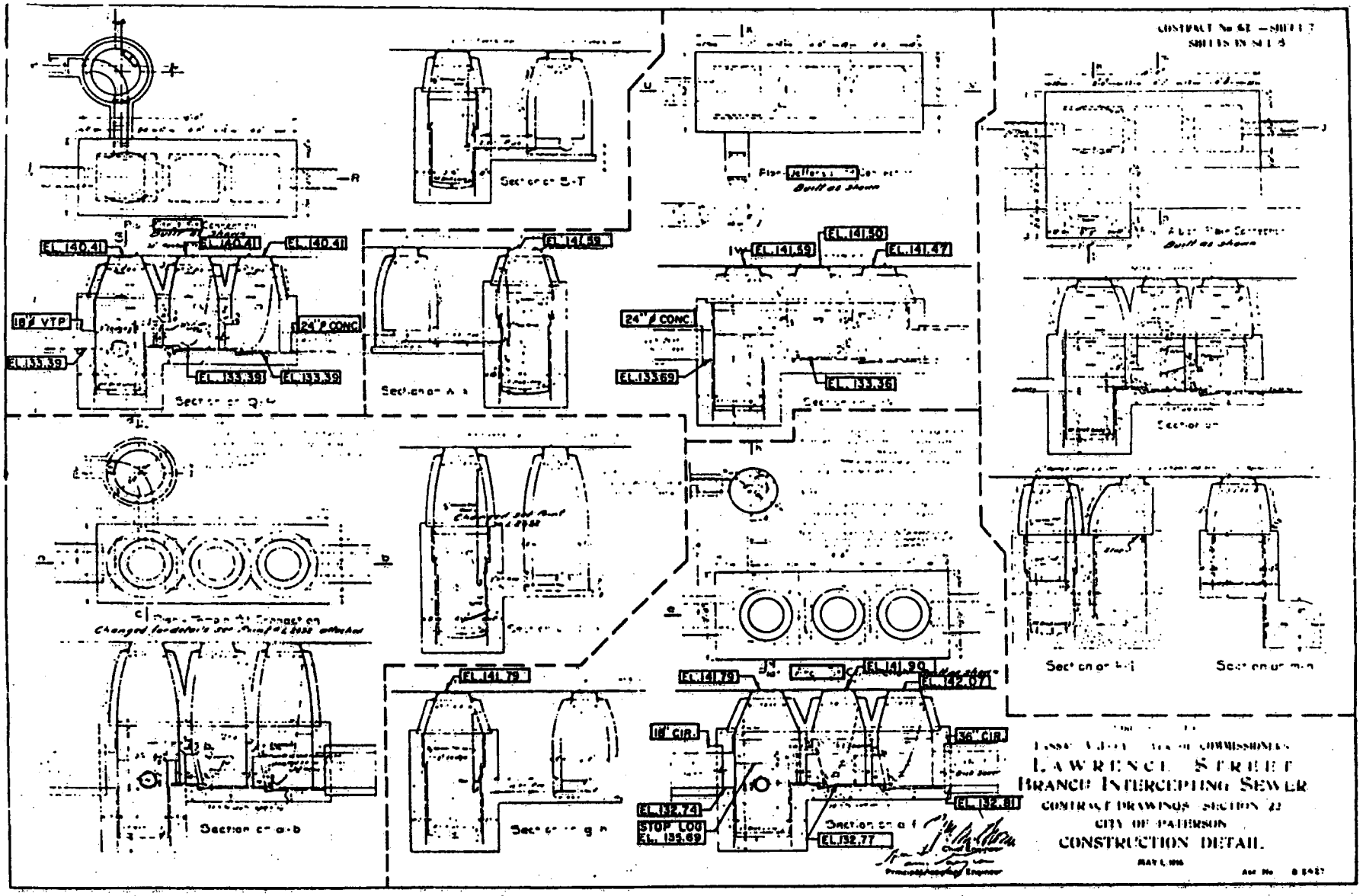
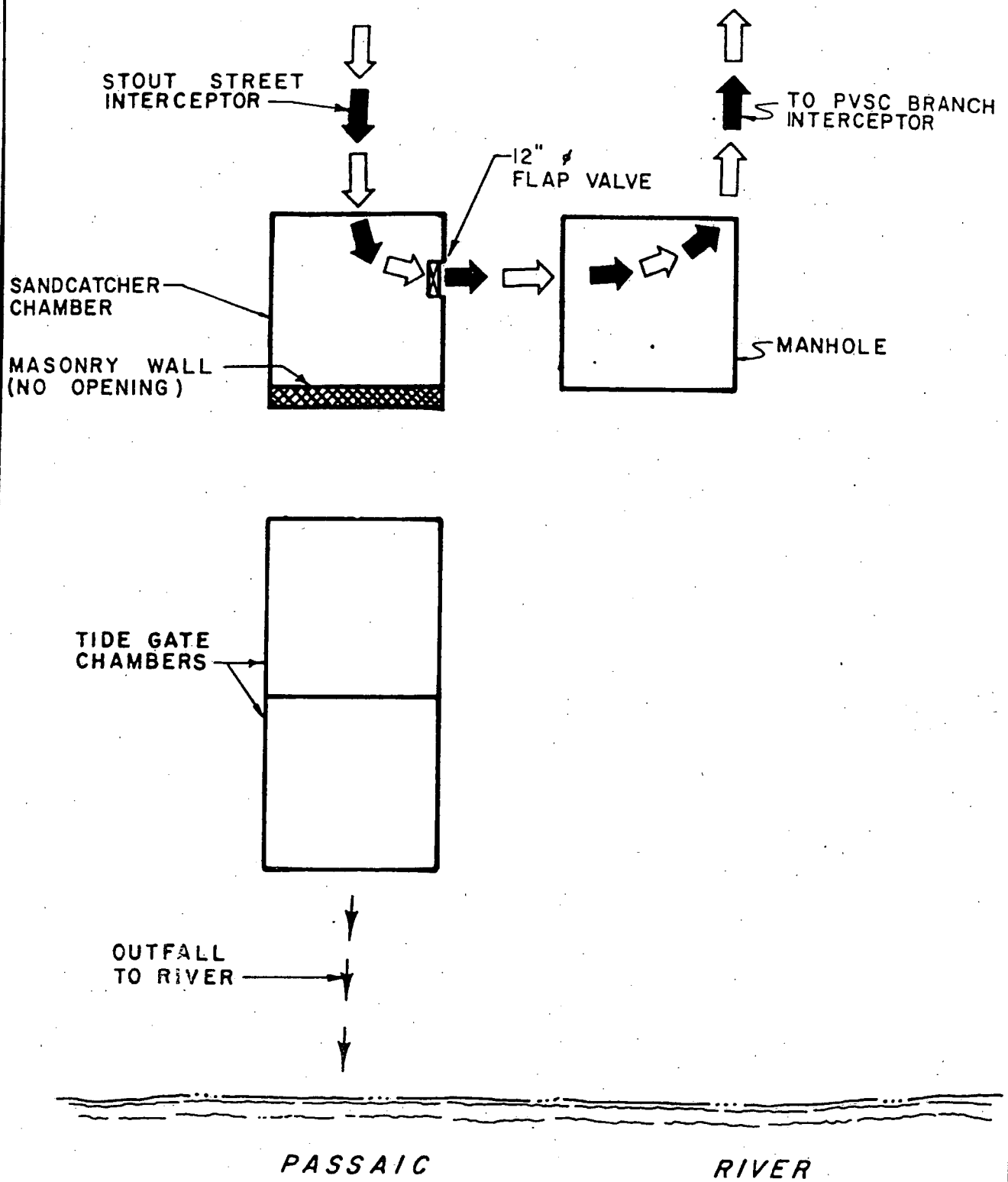


PLATE 8

(3)

KLL001702



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

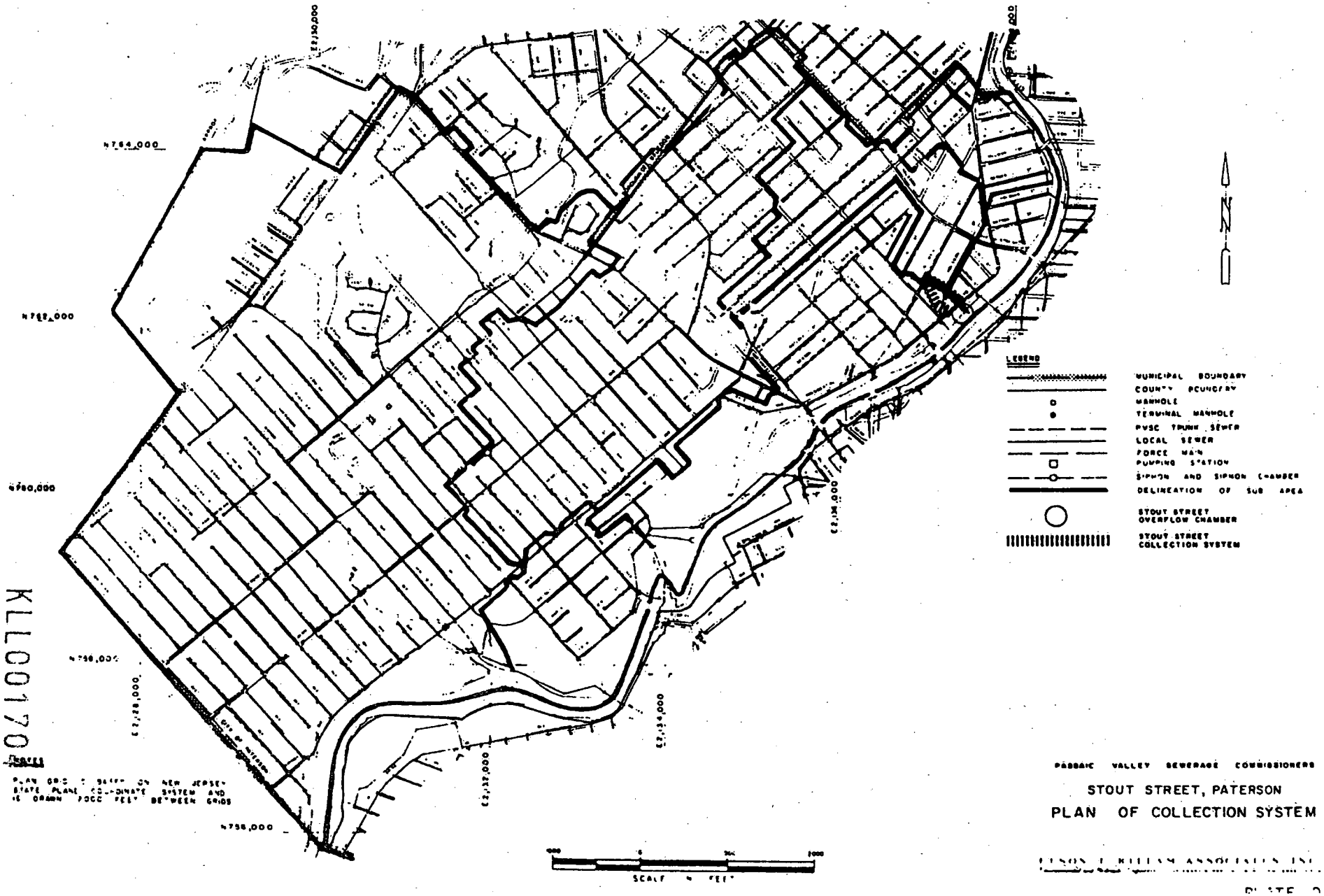
KLL001703

PASSAIC VALLEY SEWERAGE COMMISSIONERS

STOUT STREET, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC.
Environmental and Hydraulic Engineers



KLL001170

PASSAIC VALLEY SEWERAGE COMMISSIONERS

STOUT STREET, PATERSON

PLAN OF COLLECTION SYSTEM

PLATE 2

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

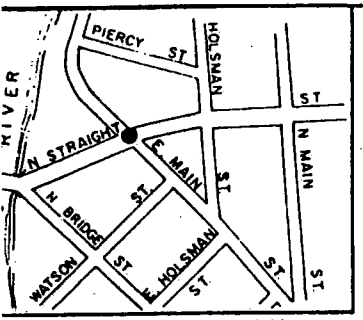
PASSAIC RIVER OVERFLOWS

NORTH STRAIGHT STREET, PATERSON
P-020

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

KLL001705



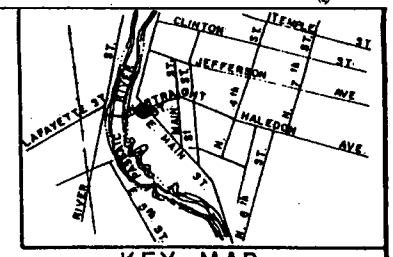
LOCATION PLAN

400 200 0 400
SCALE IN FEET

NOTE:
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

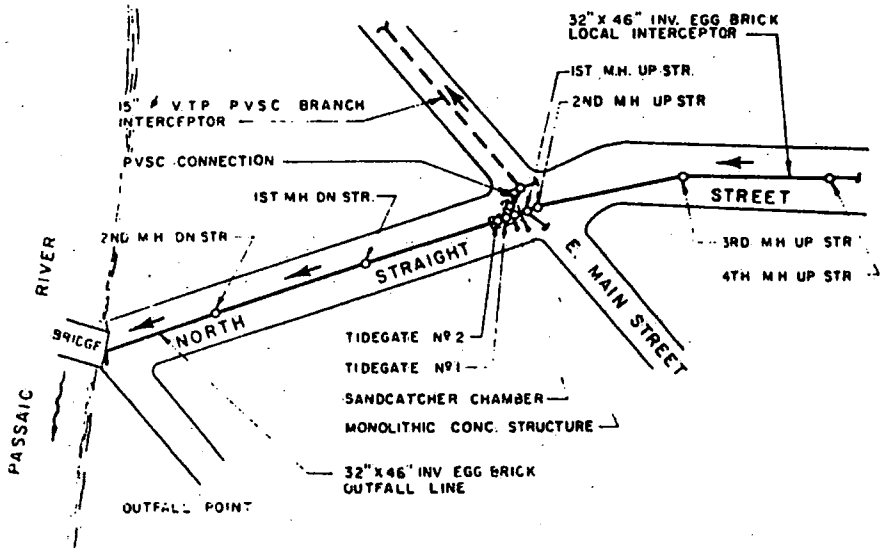
LEGEND:

- DIRECTION OF FLOW
- S.C. = SAND CATCHER
- T.G. = TIDE GATE
- UP STR. = UP STREAM
- DN STR. = DOWN STREAM
- N.T.S. = NOT TO SCALE
- ● = OVERFLOW LOCATION
- V.T.P. = VITRIFIED TILE PIPE



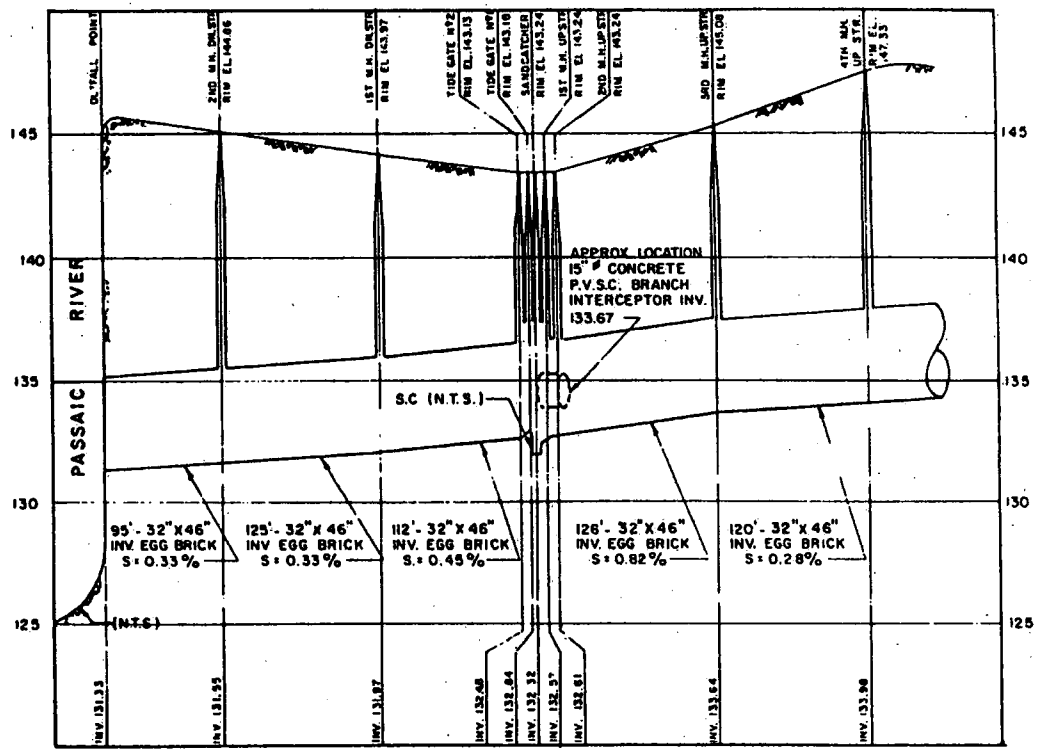
KEY MAP

2000 1000 0 2000
SCALE IN FEET



PLAN

100' 50 0 100
SCALE IN FEET



PROFILE

100 50 0 100
HORIZ. SCALE IN FEET

5 0 5
VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON
[illegible] AS ESTABLISHED BY
PAUL J. EMILIUS & ASSOCIATES
FOR LOCATION AND DESCRIPTION
SEE APPENDIX

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-020

NORTH STRAIGHT STREET, PATERSON

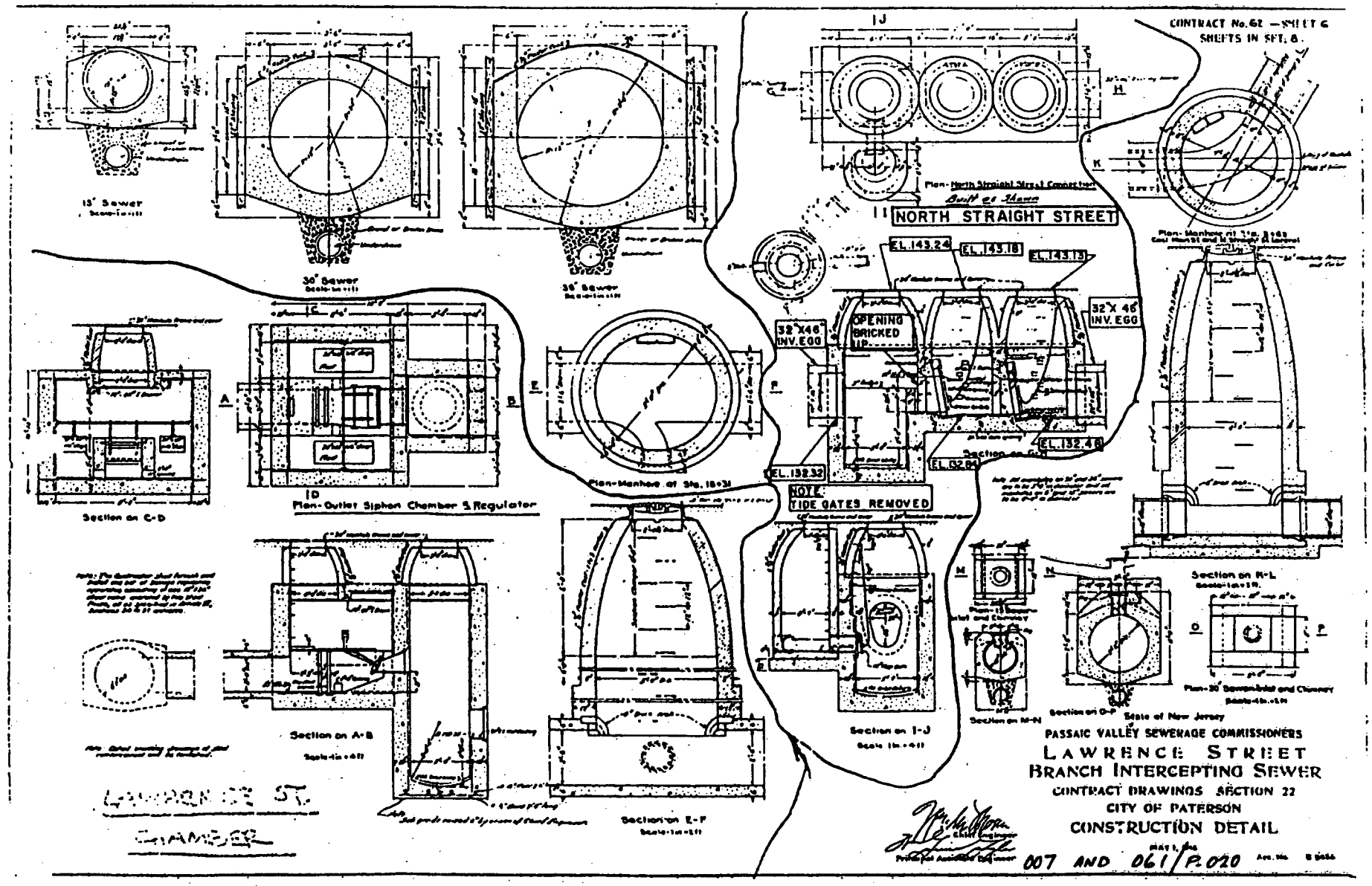
PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

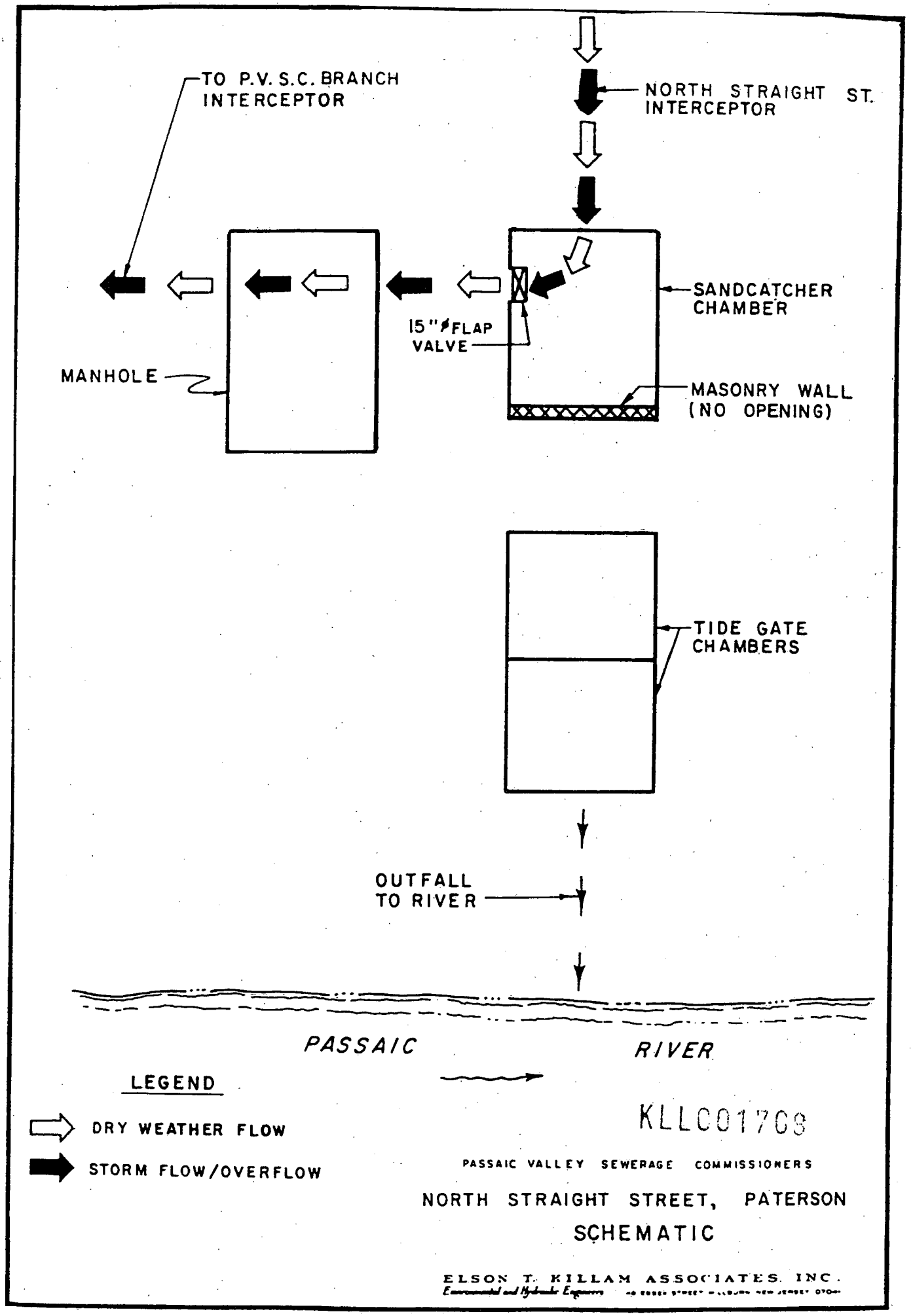
PLATE

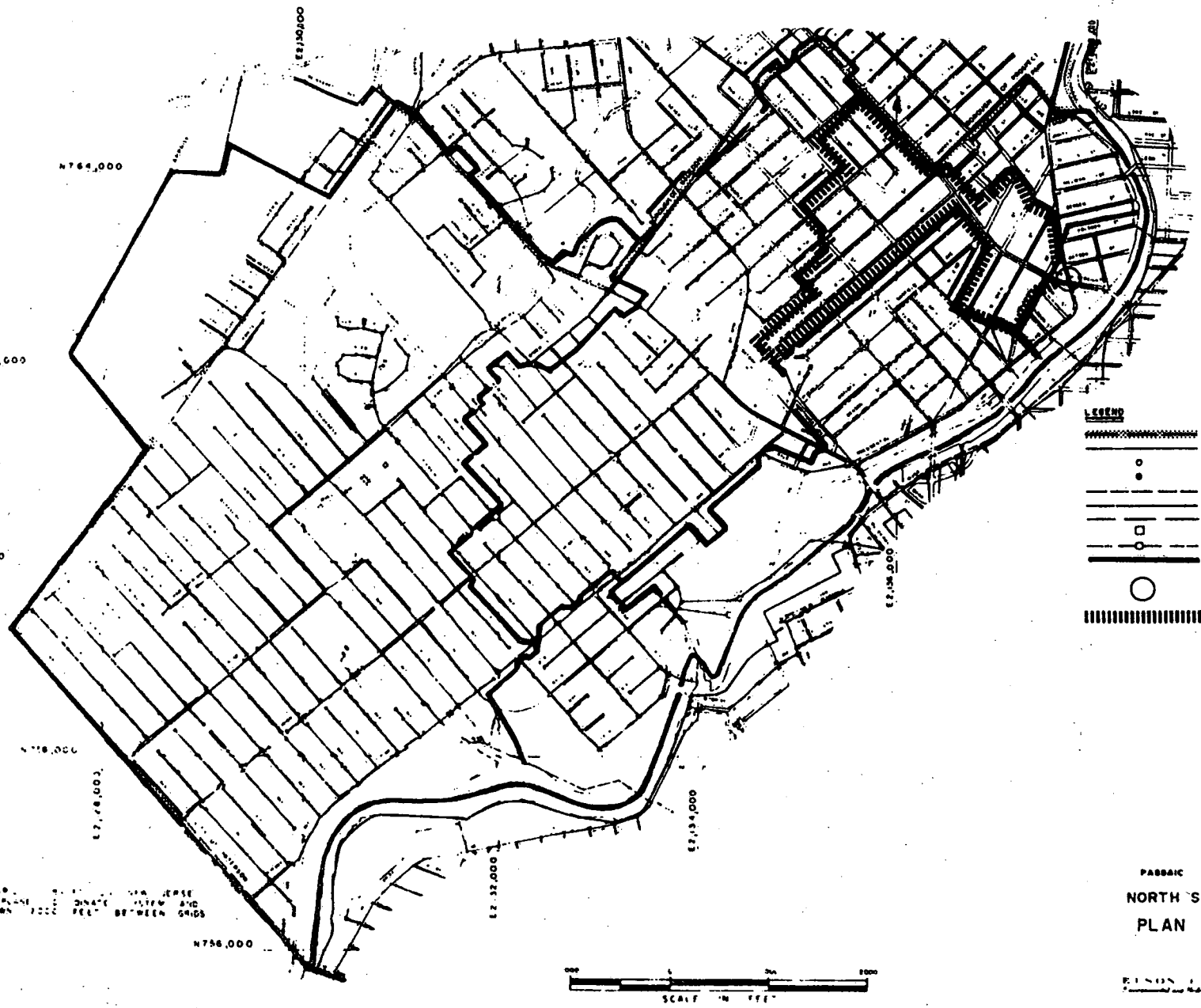
KLL001706



KLL001707

PLATE B


TO P.V.S.C. BRANCH INTERCEPTOR
NORTH STRAIGHT ST. INTERCEPTOR
SANDCATCHER CHAMBER
15"ø FLAP VALVE
MANHOLE
MASONRY WALL (NO OPENING)
TIDE GATE CHAMBERS
OUTFALL TO RIVER
PASSAIC RIVER
LEGEND
DRY WEATHER FLOW
STORM FLOW/OVERFLOW
KLLC01708
PASSAIC VALLEY SEWERAGE COMMISSIONERS
NORTH STRAIGHT STREET, PATERSON
SCHEMATIC
ELSON T. KILLAM ASSOCIATES, INC.



PASSAIC VALLEY SEWERAGE COMMISSIONERS

NORTH STRAIGHT STREET, PATERSON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC.

PLATE D

KLLC01709

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

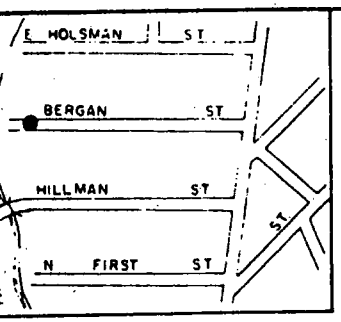
PASSAIC RIVER OVERFLOWS

BERGAN STREET, PATERSON
P-021

1976

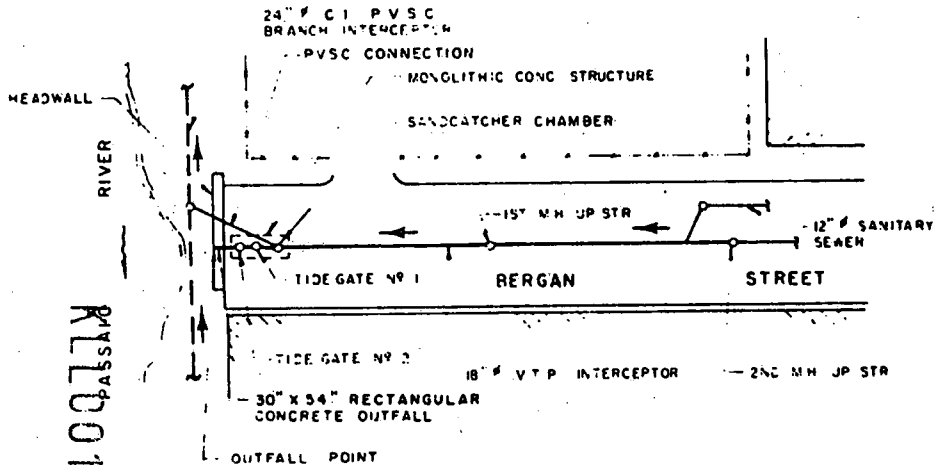
ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001710



LOCATION PLAN

SCALE IN FEET



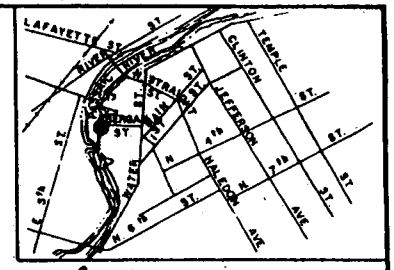
PLAN

SCALE IN FEET

NOTE:
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

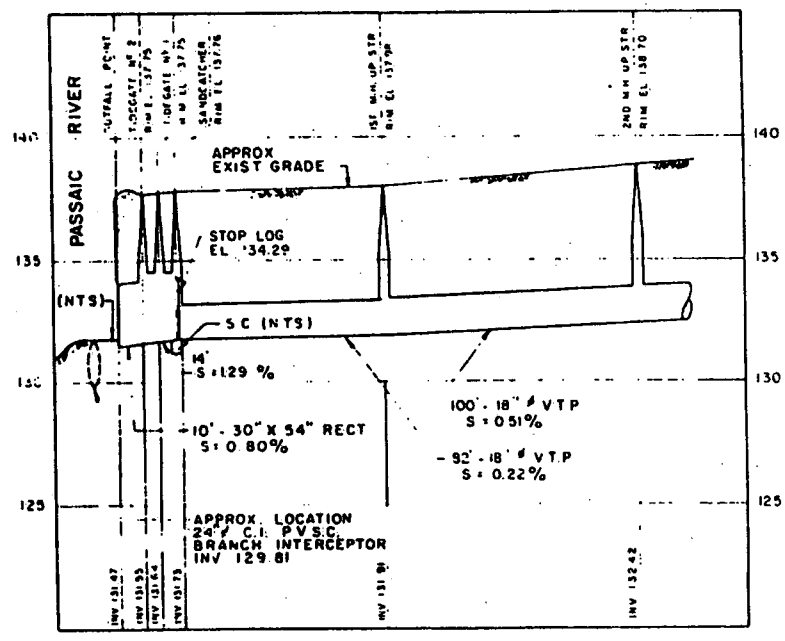
LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UPSTREAM
DN. STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
C.I. = CAST IRON
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



KEY MAP

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-021

BERGAN STREET, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

L ELEVATIONS BASED ON
. Nº 60' AS ESTABLISHED BY
L J EMILIUS & ASSOCIATES
R LOCATION AND DESCRIPTION
E APPENDIX.

PLATE A

RLL001711

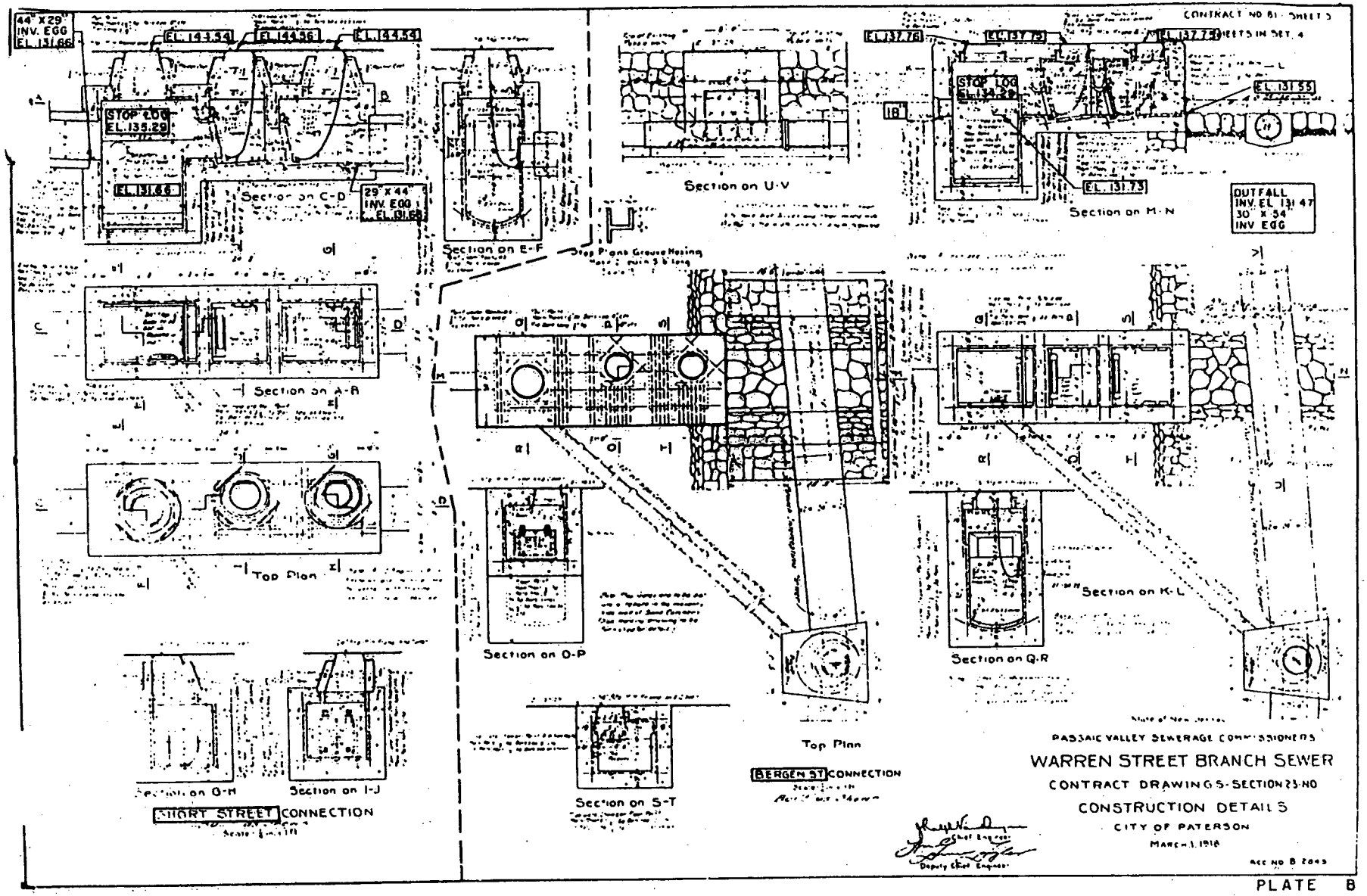
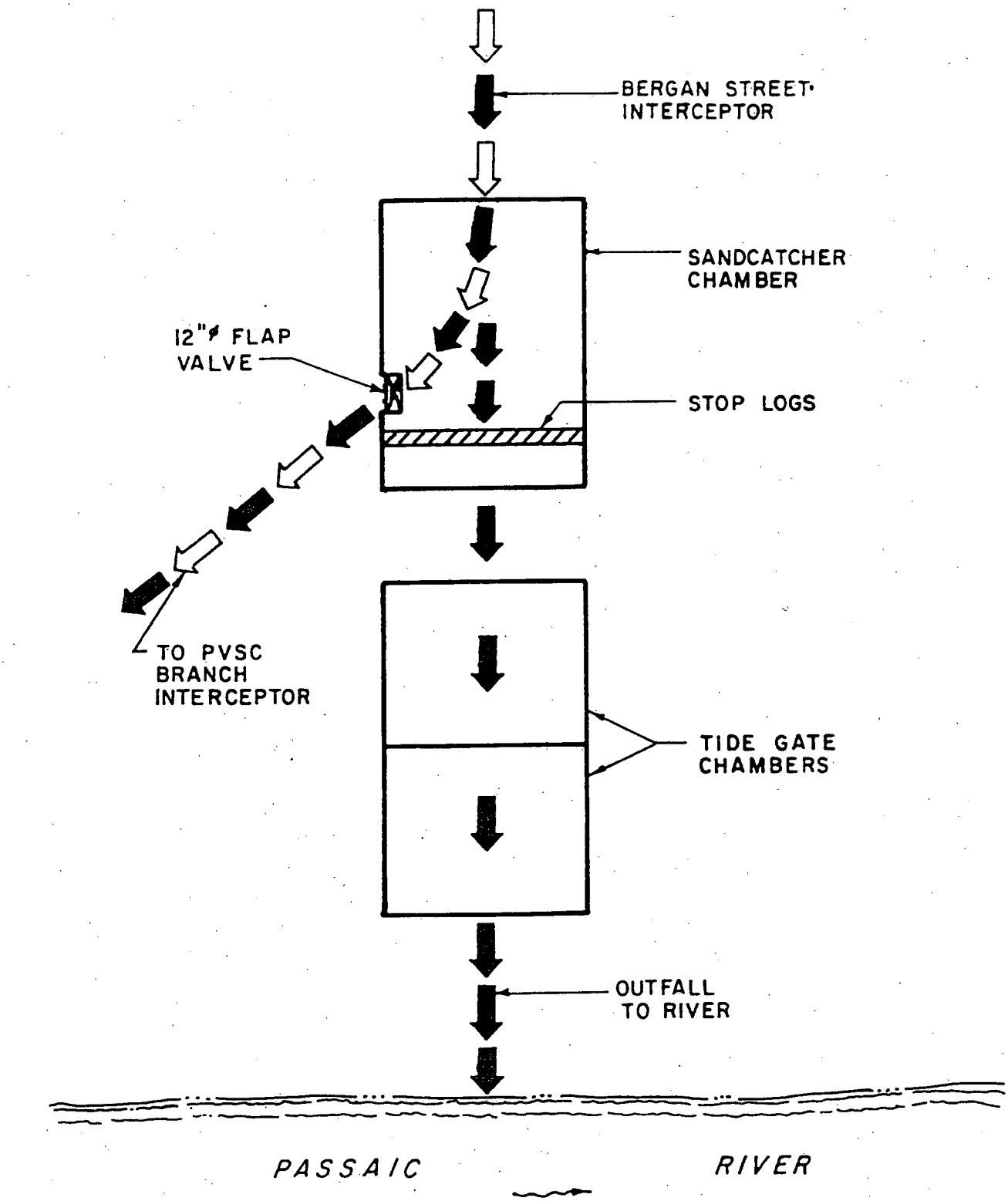


PLATE B

KLL001712



KLL001713

LEGEND

DRY WEATHER FLOW

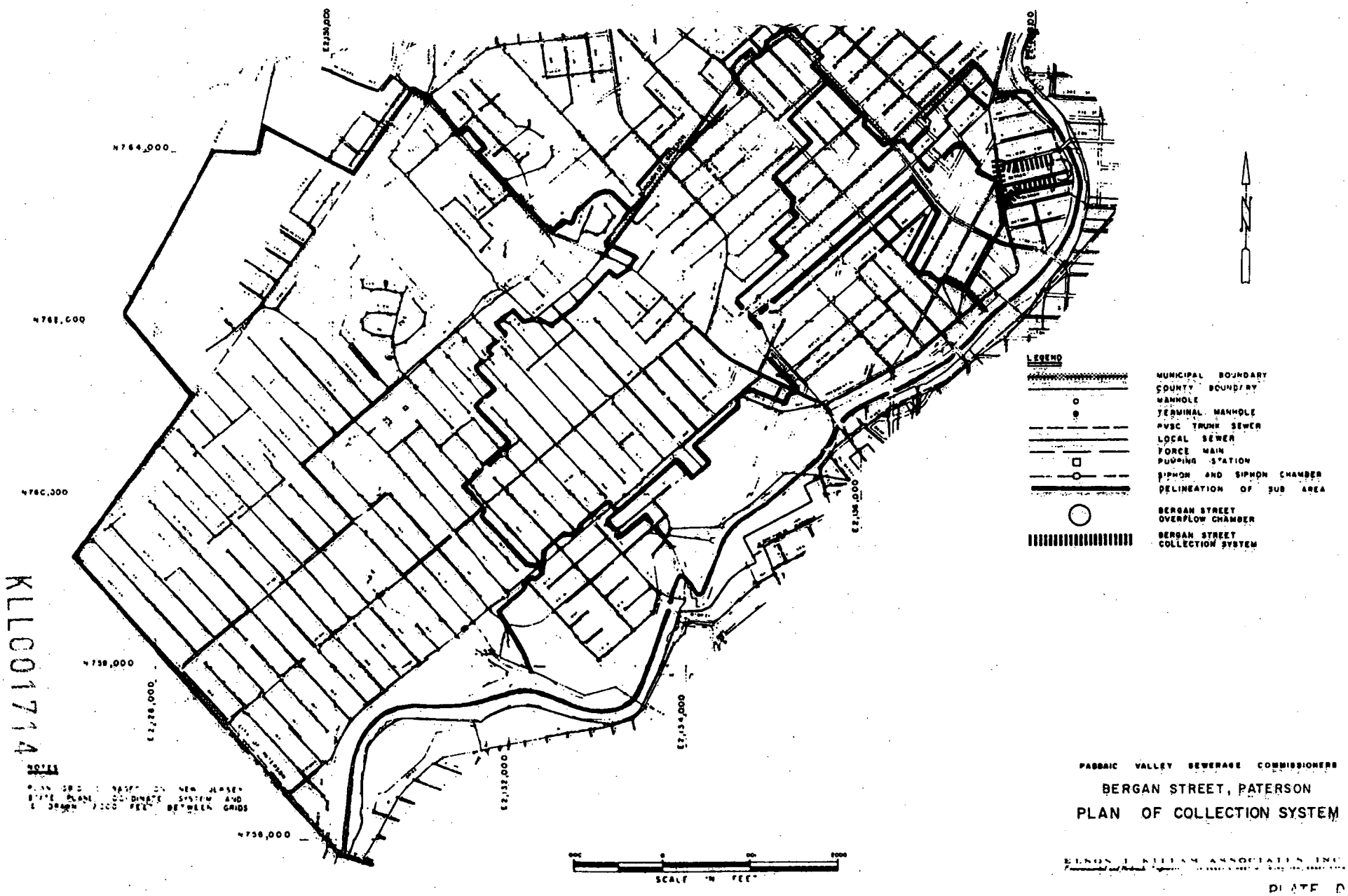
STORM FLOW/OVERFLOW

PASSAIC VALLEY SEWERAGE COMMISSIONERS

BERGAN STREET, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers



NOTES

PASSAIC VALLEY SEWERAGE COMMISSIONERS

BERGAN STREET, PATERSON

PLAN OF COLLECTION SYSTEM

ELMER L. MILLER ASSOCIATES, INC.

PLATE D

KLLC01714

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

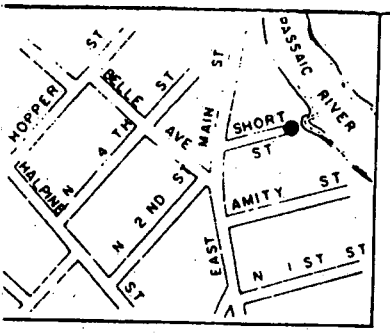
PASSAIC RIVER OVERFLOWS

SHORT STREET, PATERSON
P-022

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001715



LOCATION PLAN

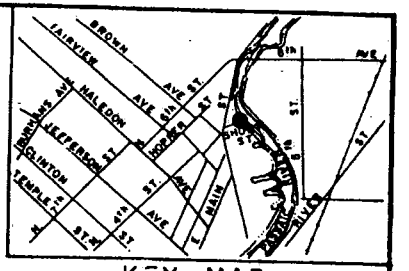
SCALE IN FEET

NOTE:

ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

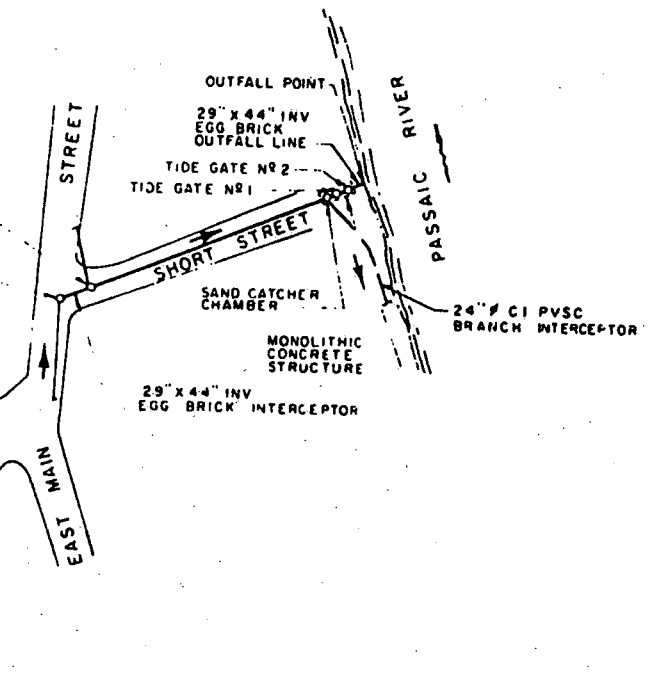
LEGEND

- DIRECTION OF FLOW
- S.C. = SAND CATCHER
- T.G. = TIDE GATE
- UP STR. = UPSTREAM
- DN STR. = DOWNSTREAM
- N.T.S. = NOT TO SCALE
- ● = OVERFLOW LOCATION



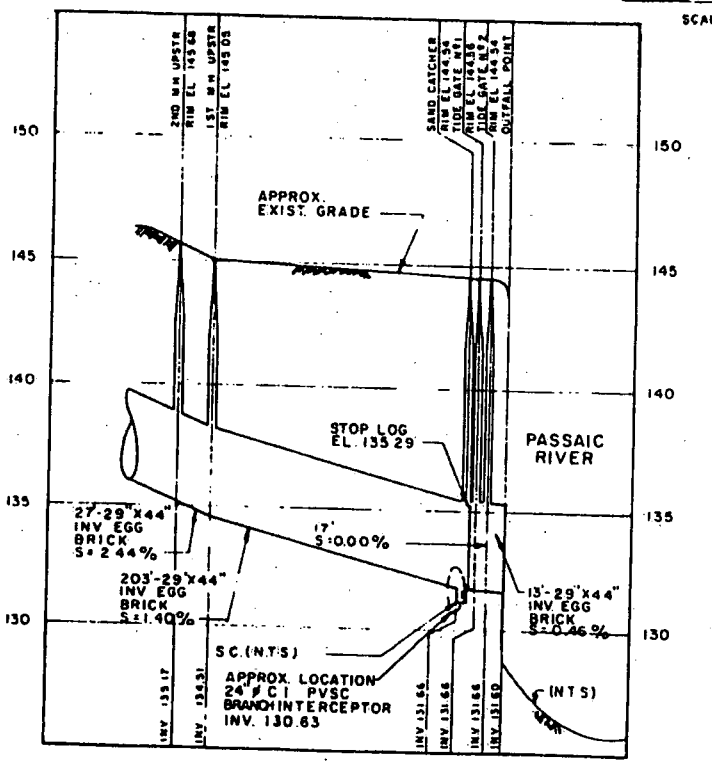
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. Nº 68 AS ESTABLISHED BY PAUL J. EMILIUS & ASSOCIATES FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-022

SHORT STREET, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.

Consulting Civil & Hydraulic Engineers

PLATE A

KLL001716

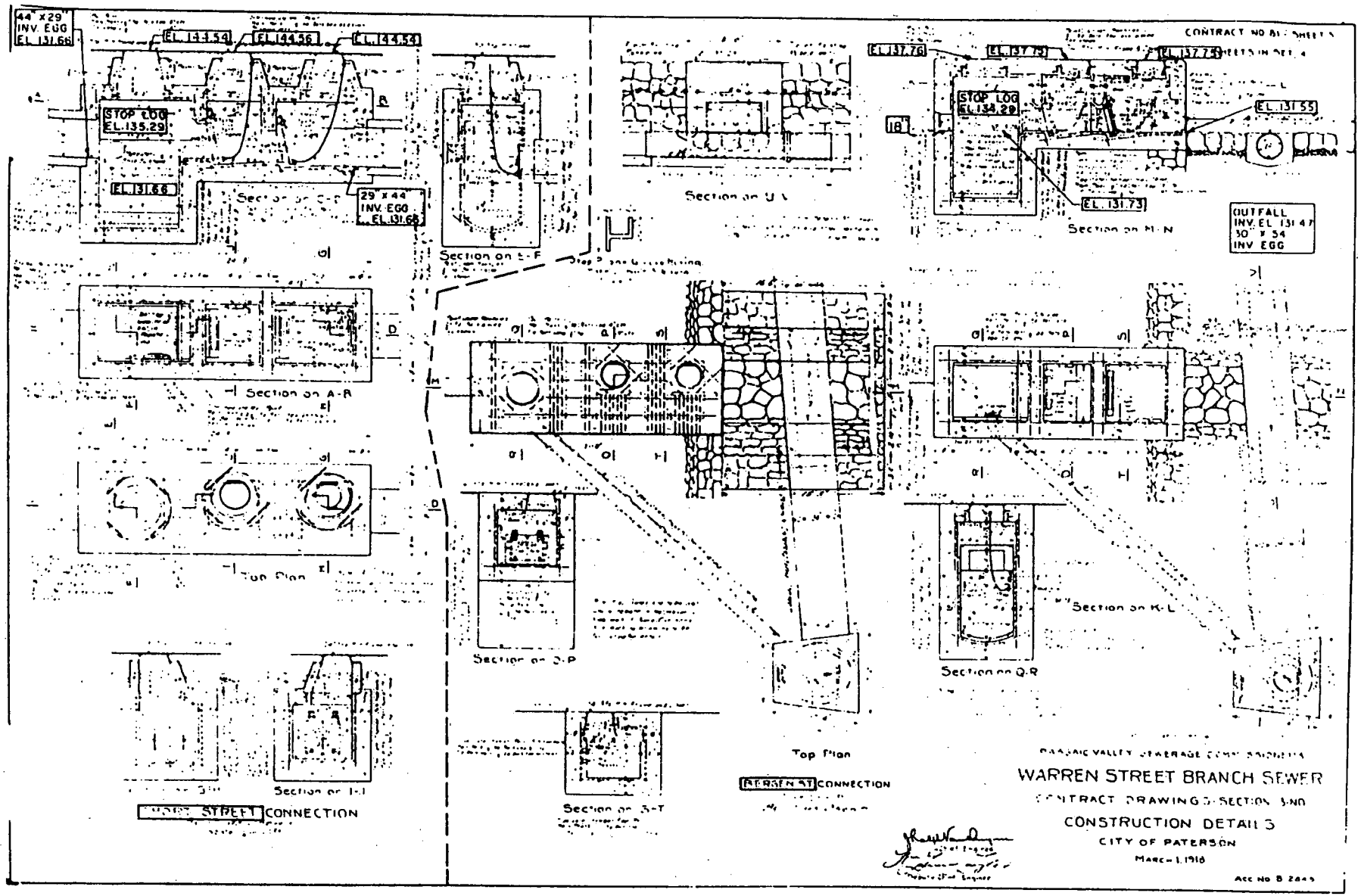
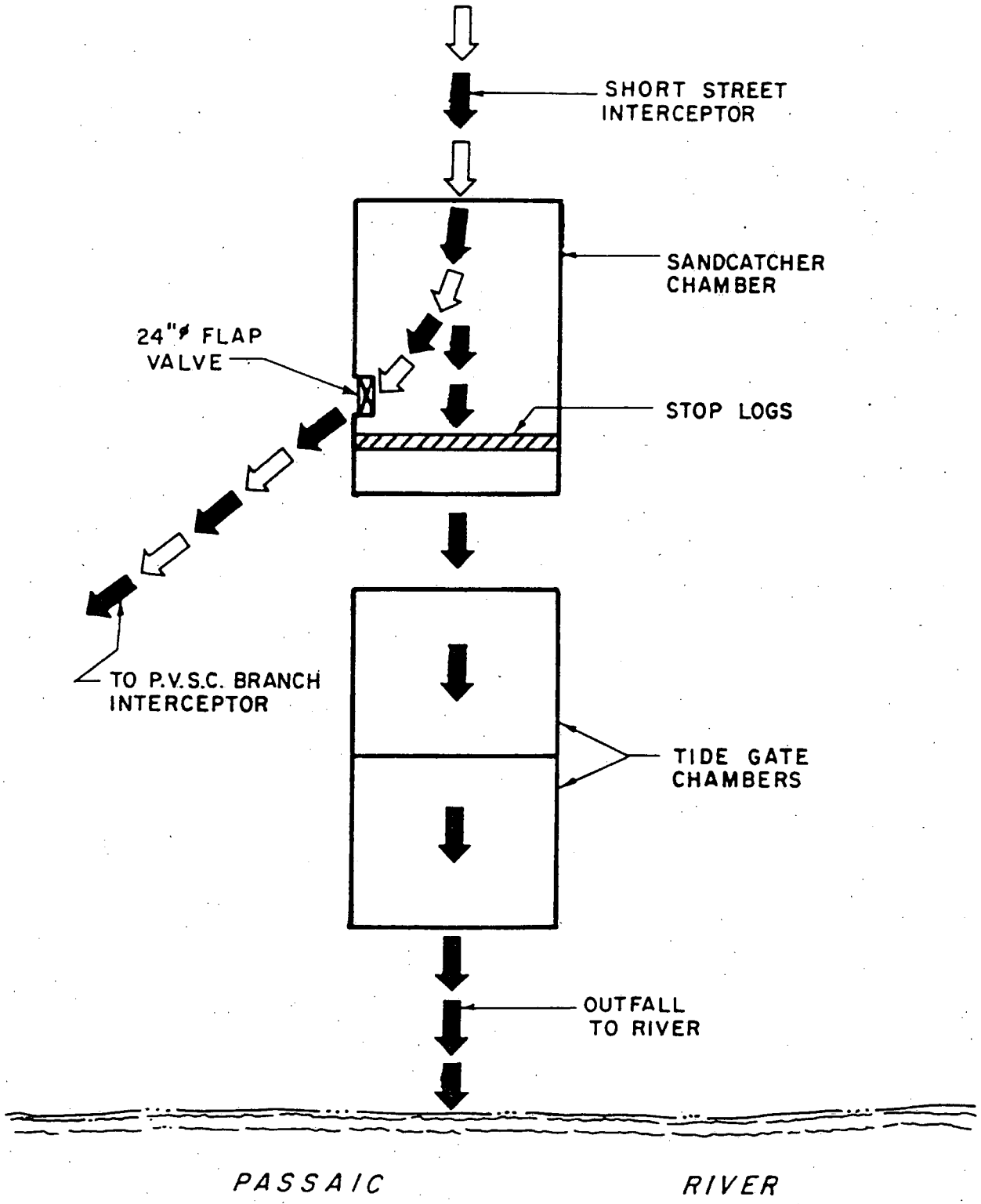


PLATE 8

KLL001717



LEGEND

DRY WEATHER FLOW

STORM FLOW / OVERFLOW

KLL001718

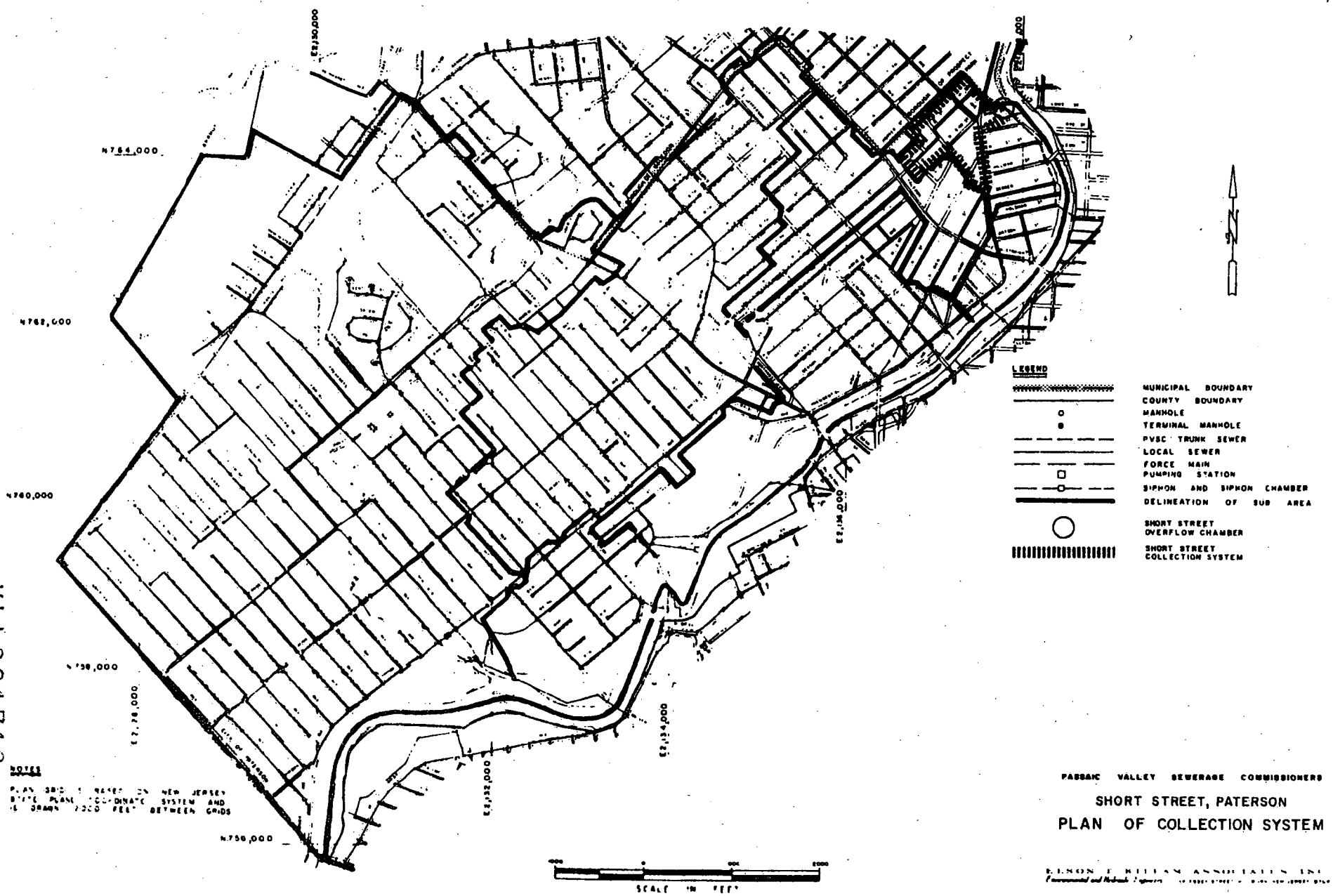
PASSAIC VALLEY SEWERAGE COMMISSIONERS

SHORT STREET, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS

PASSAIC VALLEY SEWERAGE COMMISSIONERS

SHORT STREET, PATERSON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC.

PLATE D

KLL001719

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

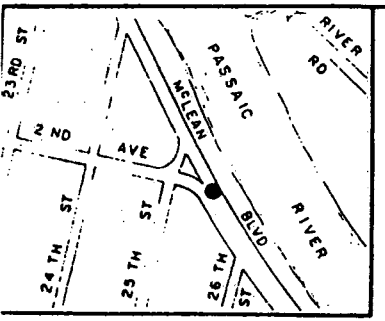
PASSAIC RIVER OVERFLOWS

SECOND AVENUE, PATERSON
P-023

1976

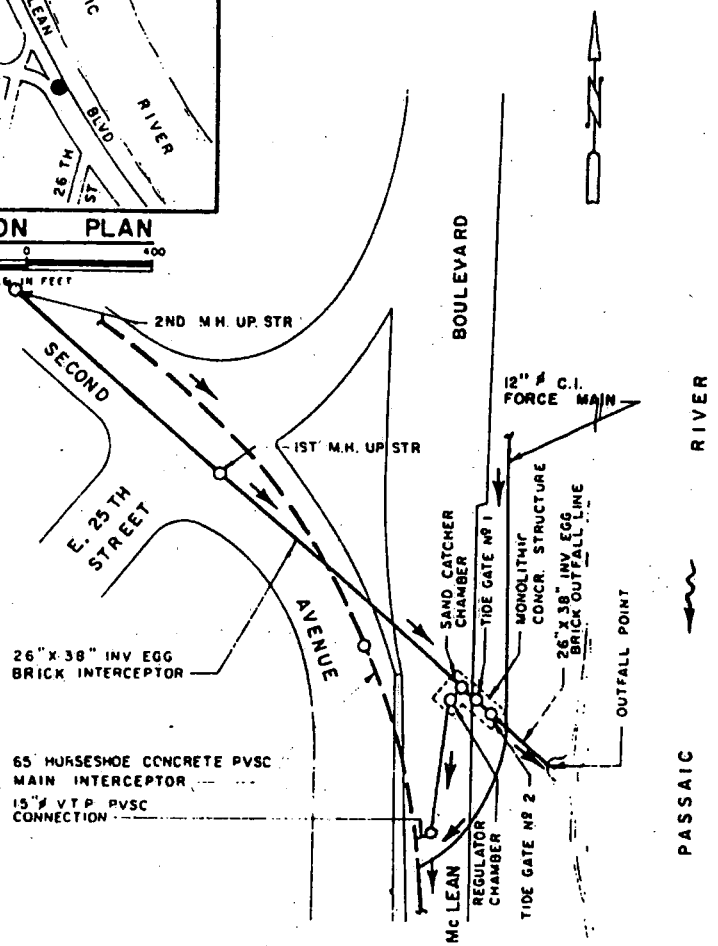
ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001720



LOCATION PLAN

400 200 0 400
SCALE IN FEET



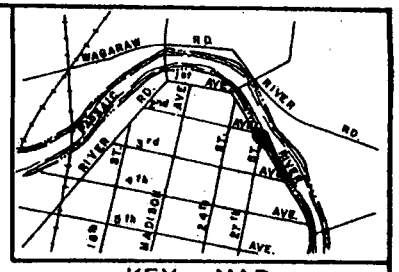
PLAN

50 25 0 50
SCALE IN FEET

NOTE:
ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

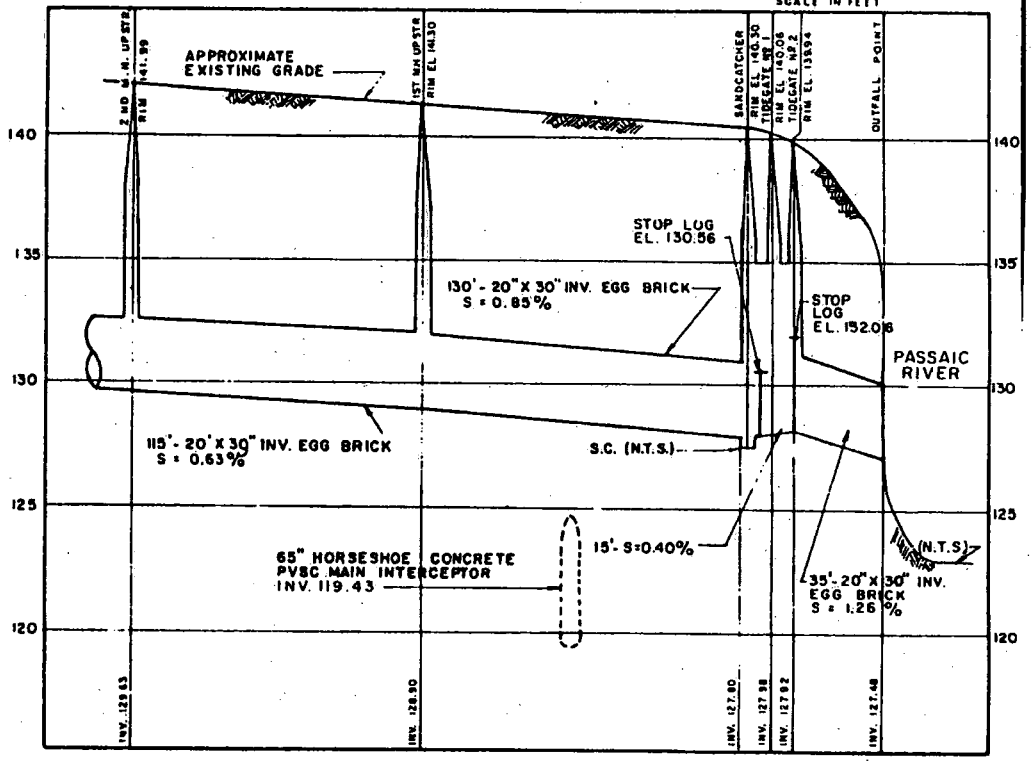
LEGEND:

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
C.I. = CAST IRON
● = OVERFLOW LOCATION



KEY MAP

2000 1000 0 2000
SCALE IN FEET



PROFILE

HORIZONTAL 50 25 0 50
SCALE IN FEET

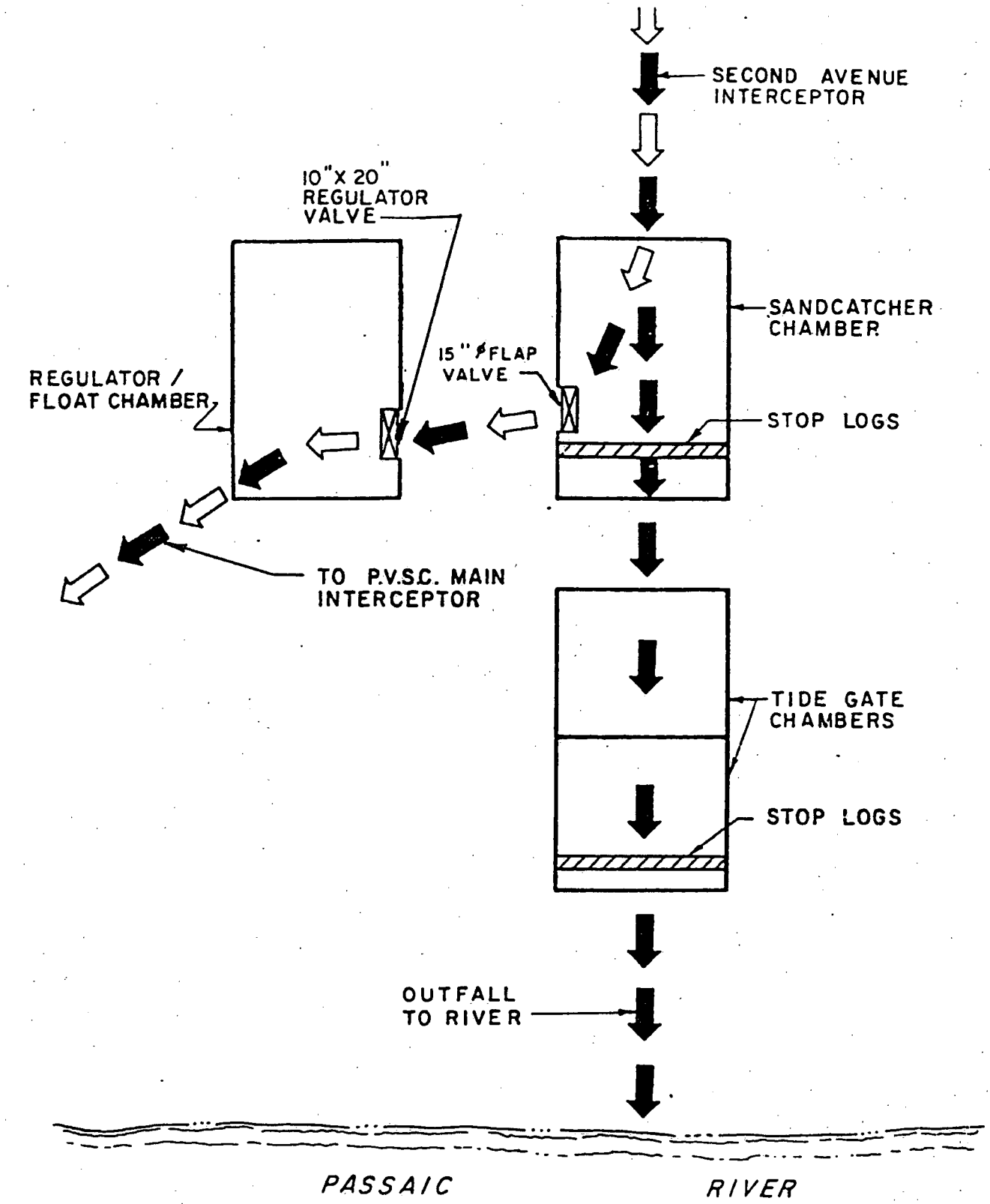
VERTICAL 5 4 3 2 1 0 5
SCALE IN FEET

ALL ELEVATIONS BASED ON
B.M. Nº 26 AS ESTABLISHED BY
PAUL J. EMILIUS & ASSOCIATES
FOR LOCATION AND DESCRIPTION
SEE APPENDIX

PASSAIC VALLEY SEWERAGE COMMISSIONERS
OVERFLOW CHAMBER P-023
SECOND AVENUE, PATERSON
PLAN AND PROFILE
ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE A

KLL001721



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001723

PASSAIC VALLEY SEWERAGE COMMISSIONERS

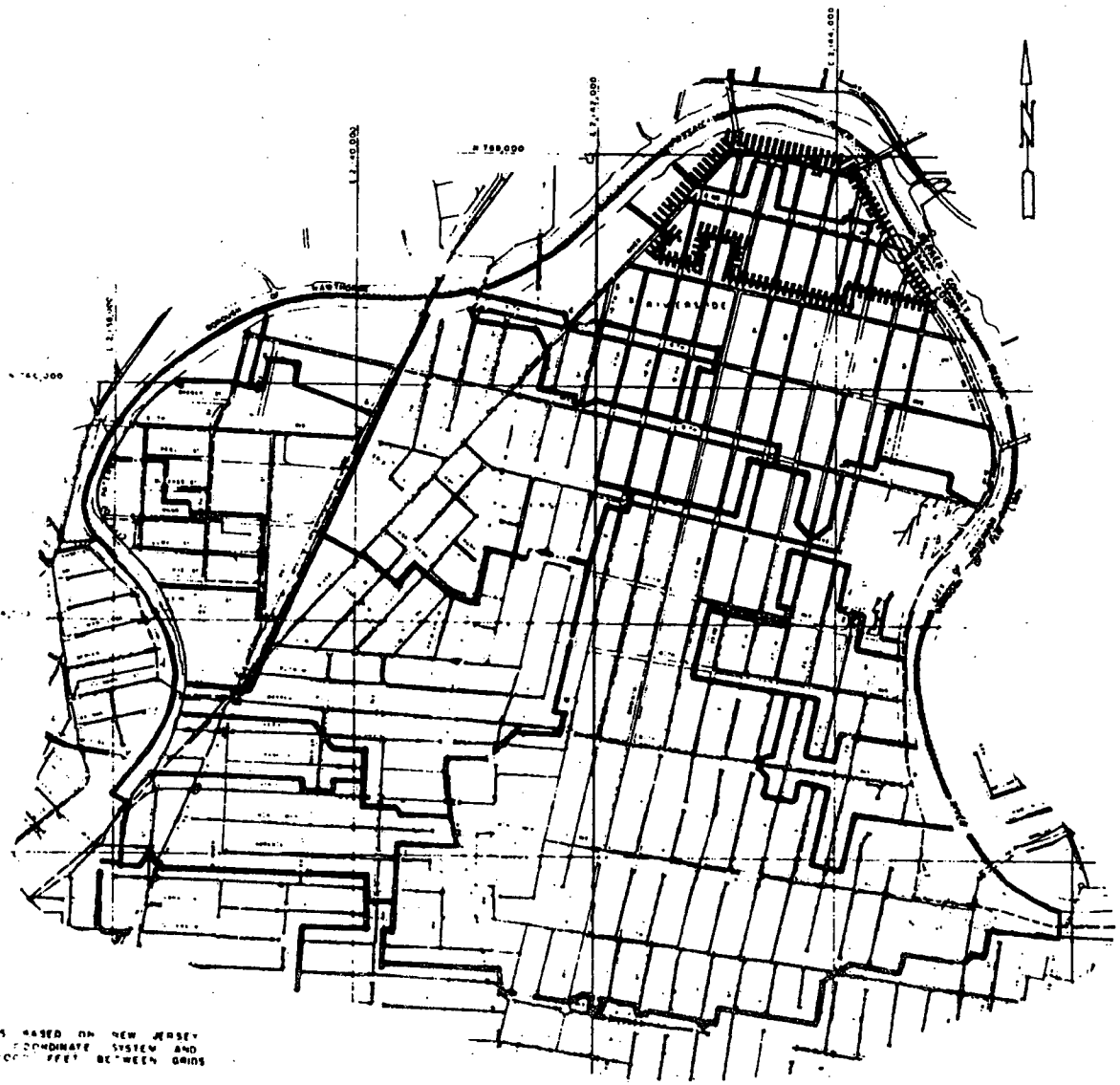
SECOND AVENUE, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

PLATE C



LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- SECOND AVENUE OVERFLOW CHAMBER
- SECOND AVENUE COLLECTION SYSTEM

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND [illegible] 2000 FEET BETWEEN GRIDS

SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

SECOND AVENUE, PATERSON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC.

PLATE D

KLL001724

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

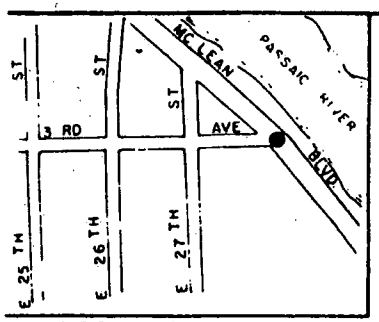
PASSAIC RIVER OVERFLOWS

THIRD AVENUE, PATERSON
P-024

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001725



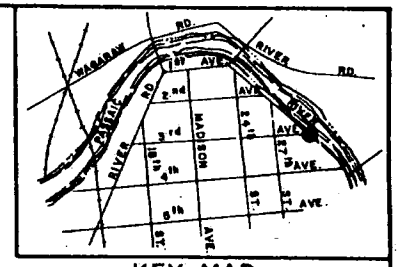
LOCATION PLAN

400 200 0 400
SCALE IN FEET

NOTE:
ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

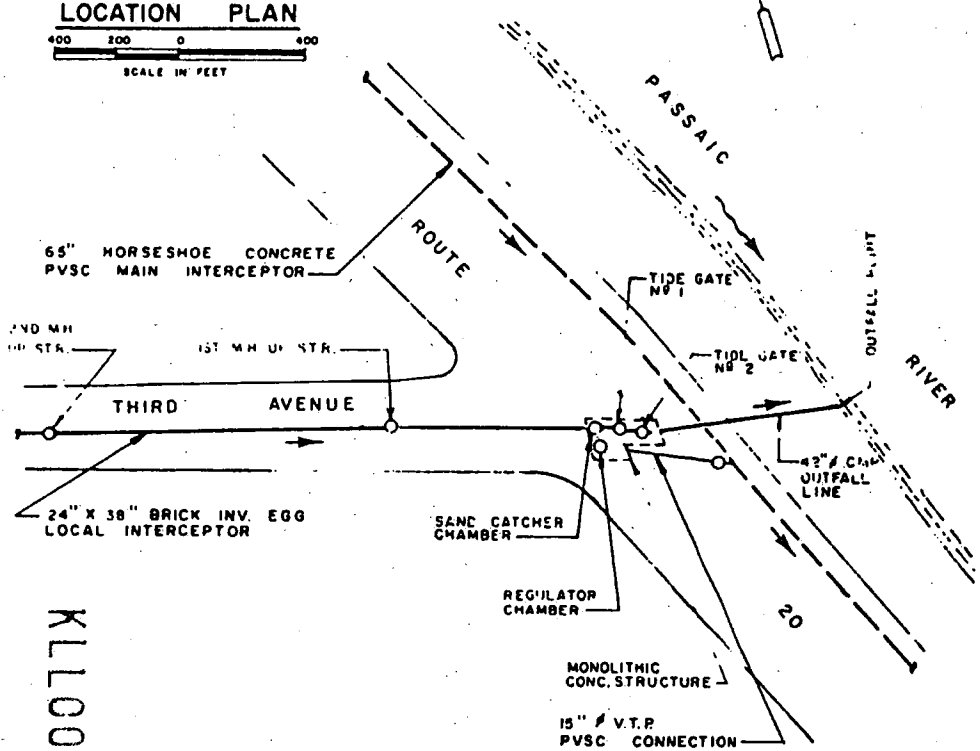
LEGEND:

- DIRECTION OF FLOW
- S.C. = SAND CATCHER
- T.G. = TIDE GATE
- UP STR. = UP STREAM
- DN. STR. = DOWN STREAM
- N.T.S. = NOT TO SCALE
- C.M.P. = CORRUGATED METAL PIPE
- V.T.P. = VITRIFIED TILE PIPE
- ● = OVERFLOW LOCATION



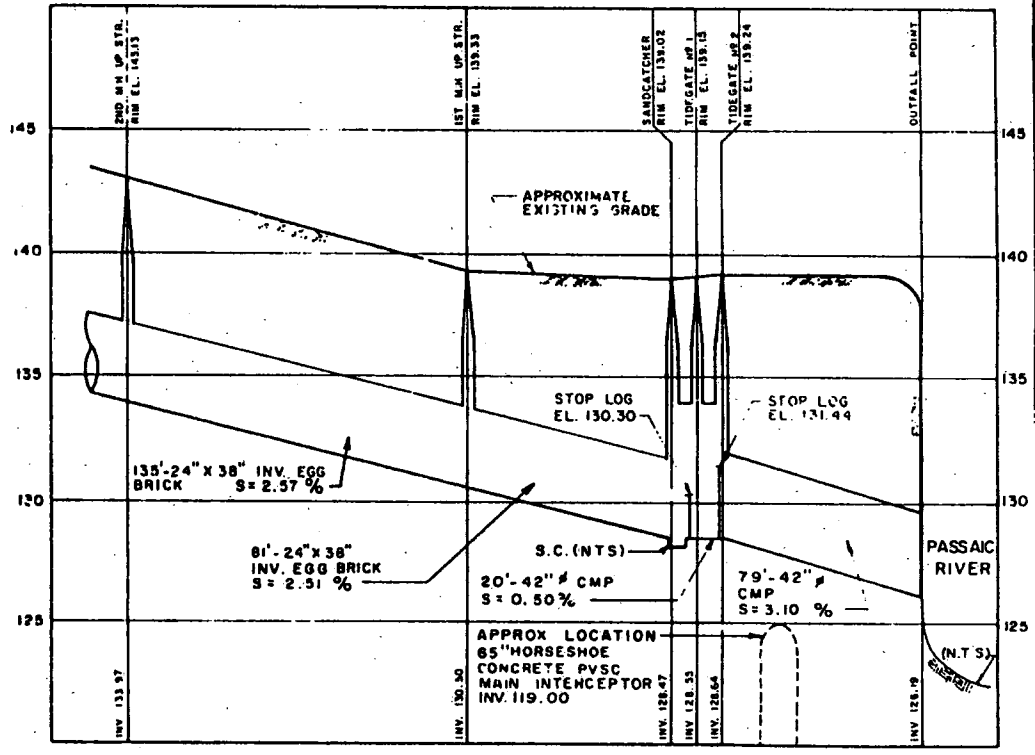
KEY MAP

2000 1000 0 2000
SCALE IN FEET



PLAN

50 25 0 50
SCALE IN FEET



PROFILE

HORIZONTAL 50 25 0 50
SCALE IN FEET

VERTICAL 5 4 3 2 1 0 5
SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-024

THIRD AVENUE, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

KL1001729

PLATE A

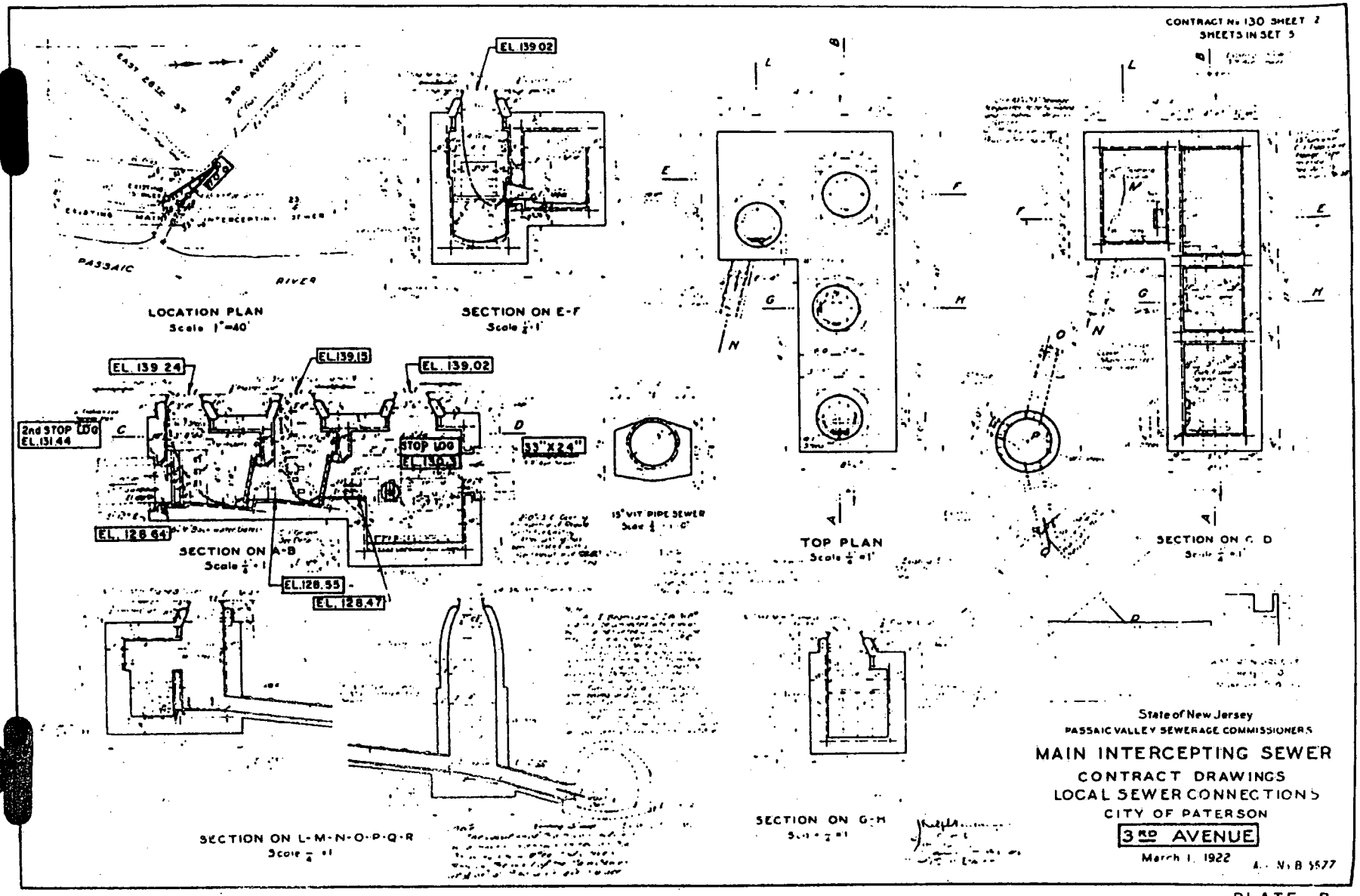
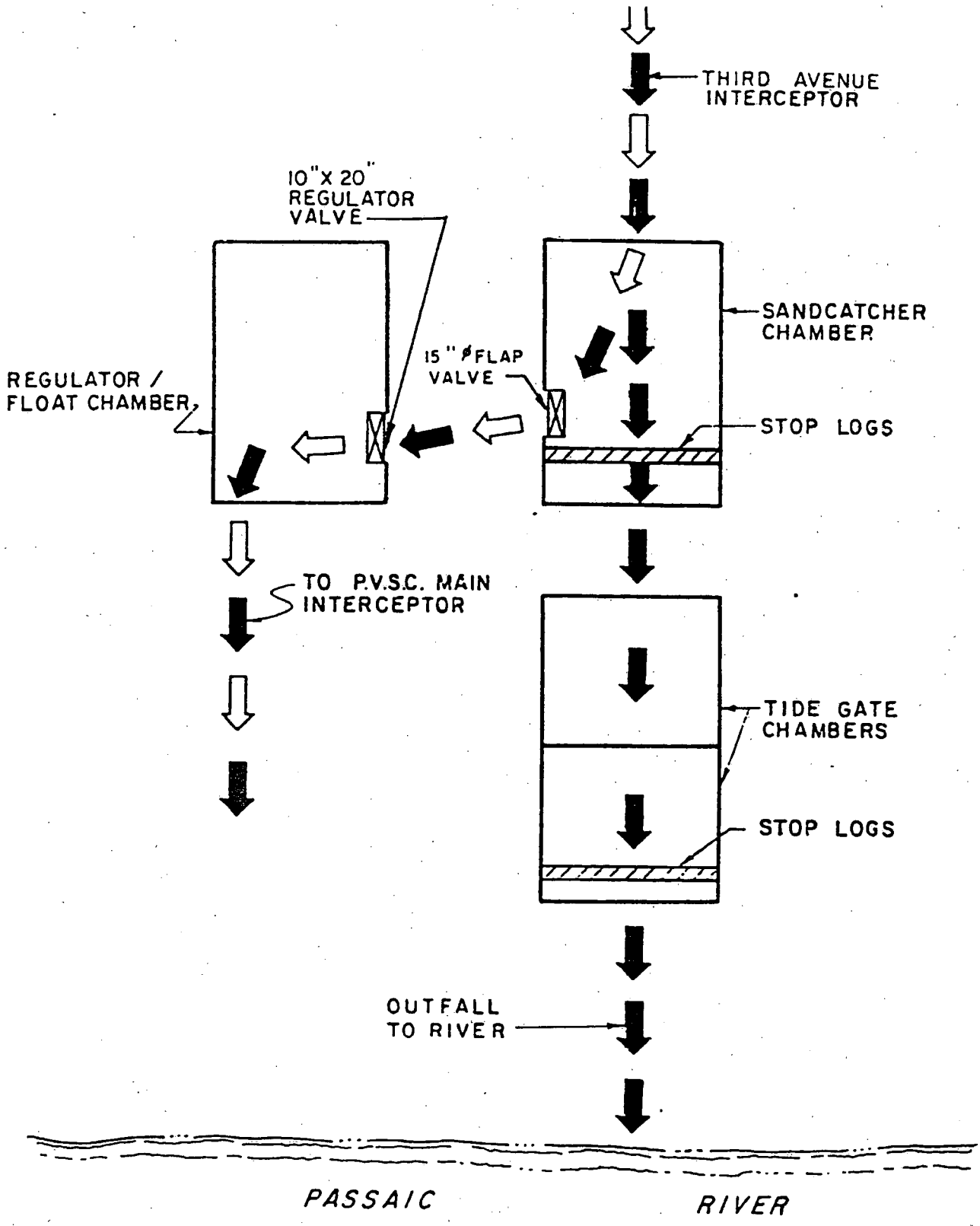


PLATE B

(3)

KLL001727



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001728

PASSAIC VALLEY SEWERAGE COMMISSIONERS

THIRD AVENUE, PATERSON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

PLATE C

LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- THIRD AVENUE OVERFLOW CHAMBER
- THIRD AVENUE COLLECTION SYSTEM

NOTES

[illegible] GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN [illegible] FEET BETWEEN GRIDS

PASSAIC VALLEY SEWERAGE COMMISSIONERS

THIRD AVENUE, PATERSON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

PLATE D

KLLC01729

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC RIVER OVERFLOWS

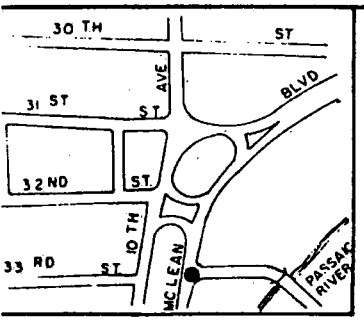
10th AVENUE & EAST 33rd STREET, PATERSON

P-025

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

KLL001730



LOCATION PLAN

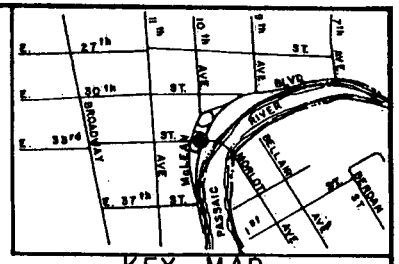
SCALE IN FEET

NOTE:

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

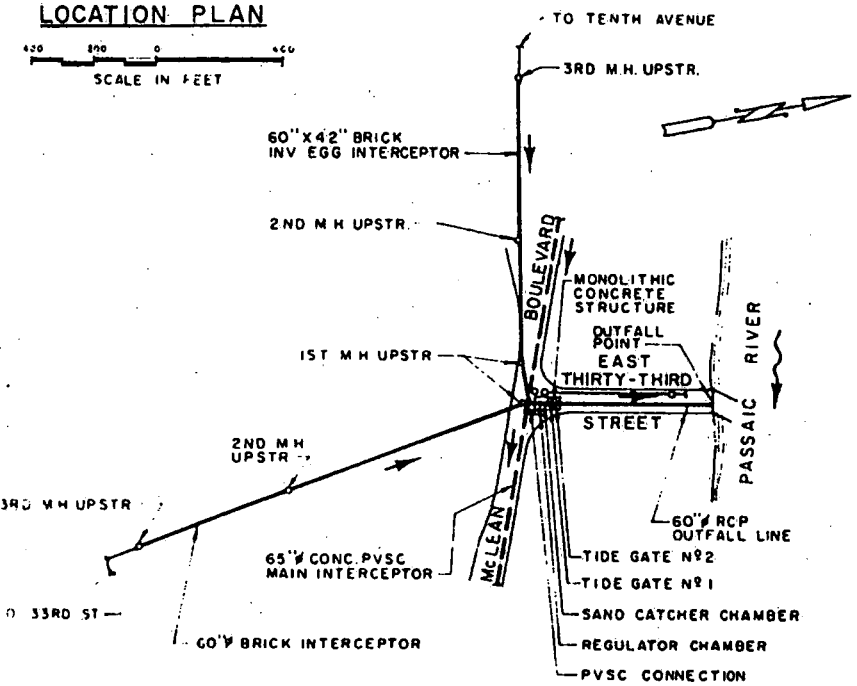
LEGEND:

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
N.T.S. = NOT TO SCALE
R.C.P. = REINFORCED CONCRETE PIPE
● = OVERFLOW LOCATION



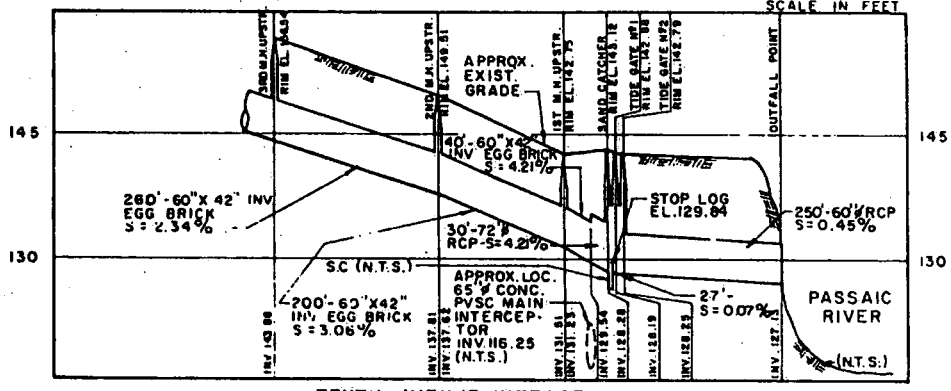
KEY MAP

SCALE IN FEET

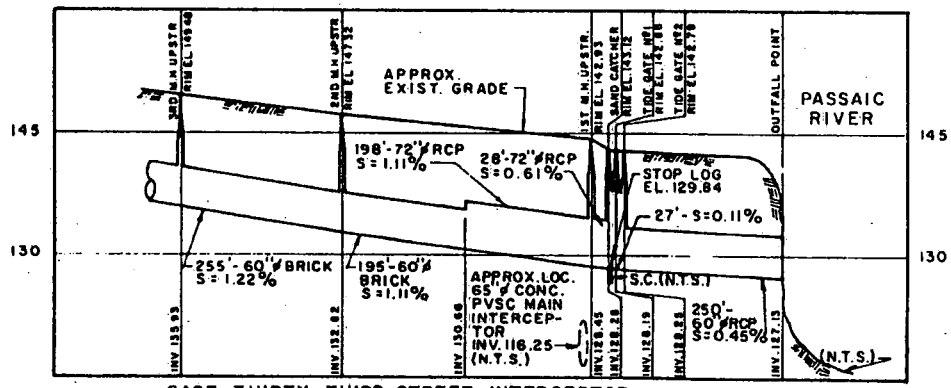


PLAN

SCALE IN FEET



TENTH AVENUE INTERCEPTOR



PROFILES EAST THIRTY-THIRD STREET INTERCEPTOR

HORIZ. SCALE IN FEET

VERT SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-025

10th AVENUE & EAST 33rd STREET, PATERSON

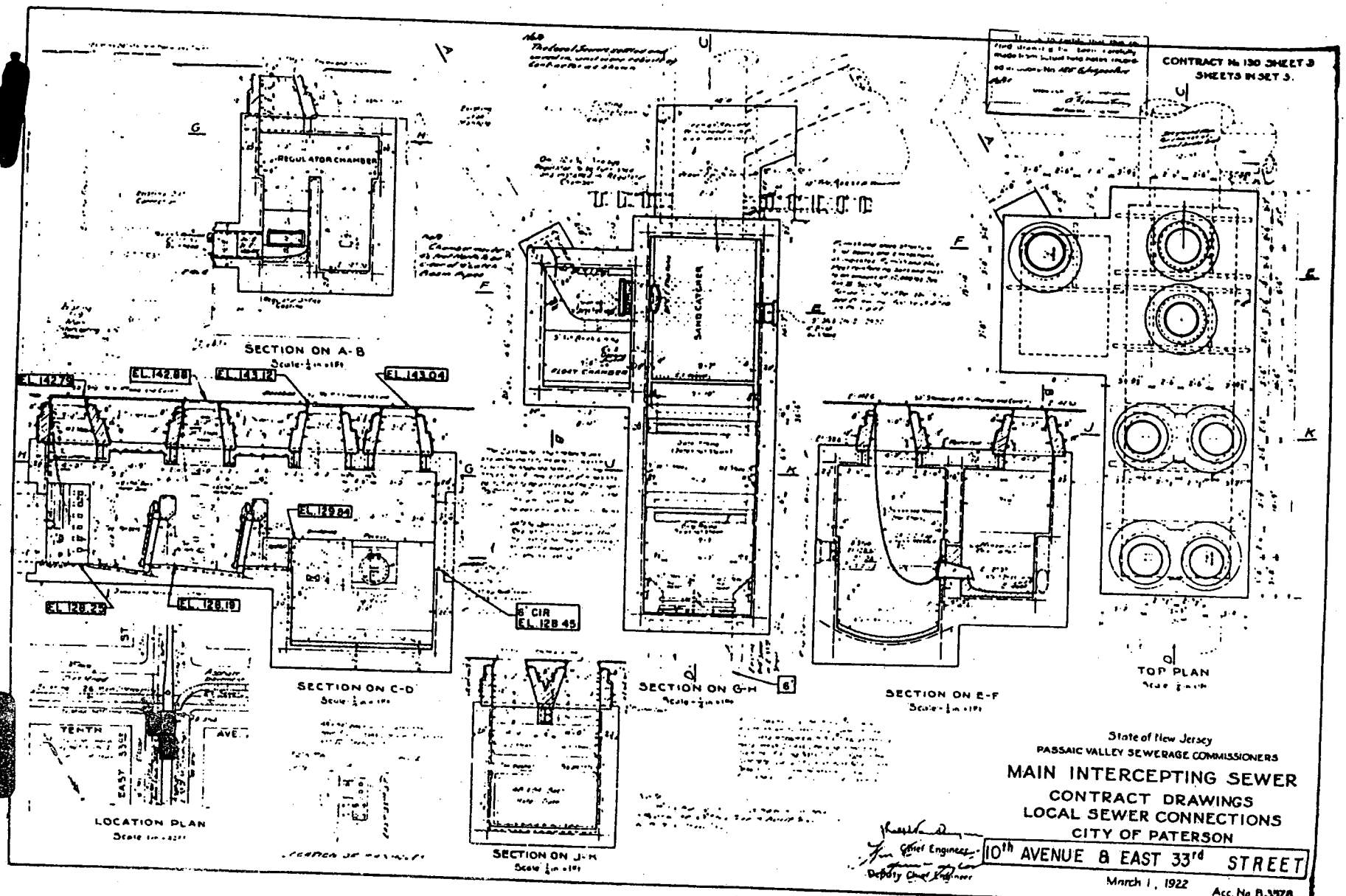
PLAN AND PROFILES

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE A

KLL001731


CONTRACT No. 130 SHEET 3
SHEETS IN SET 3.
REGULATOR CHAMBER
SAND CATCHER
FLOAT CHAMBER
SECTION ON A-B
Scale-1/4 in = 1 ft
EL. 142.79
EL. 142.88
EL. 143.12
EL. 143.04
EL. 129.64
EL. 128.29
EL. 128.19
6" CIR
EL. 128.45
SECTION ON C-D
Scale 1/4 in = 1 ft
SECTION ON J-K
Scale 1/4 in = 1 ft
SECTION ON G-H
Scale-1/4 in = 1 ft
SECTION ON E-F
Scale-1/4 in = 1 ft
TOP PLAN
Scale 1/4 in = 1 ft
TENTH
AVE.
EAST 33RD ST.
LOCATION PLAN
Scale 1 in = 200 ft
State of New Jersey
PASSAIC VALLEY SEWERAGE COMMISSIONERS
MAIN INTERCEPTING SEWER
CONTRACT DRAWINGS
LOCAL SEWER CONNECTIONS
CITY OF PATERSON
10th AVENUE & EAST 33rd STREET
Chief Engineer
Deputy Chief Engineer
March 1, 1922
Acc. No B 3578
PLATE B

(3)

KLL001732

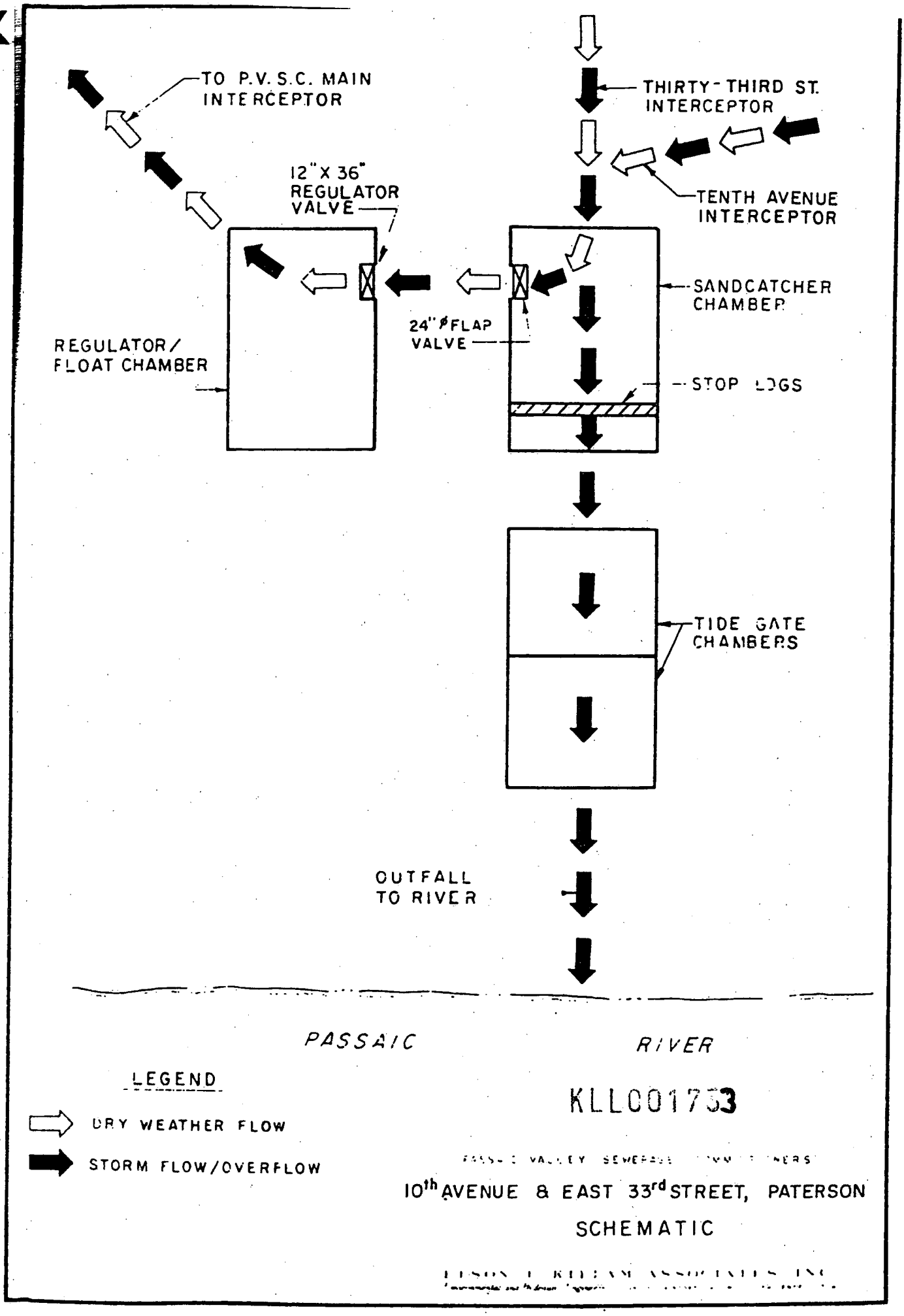
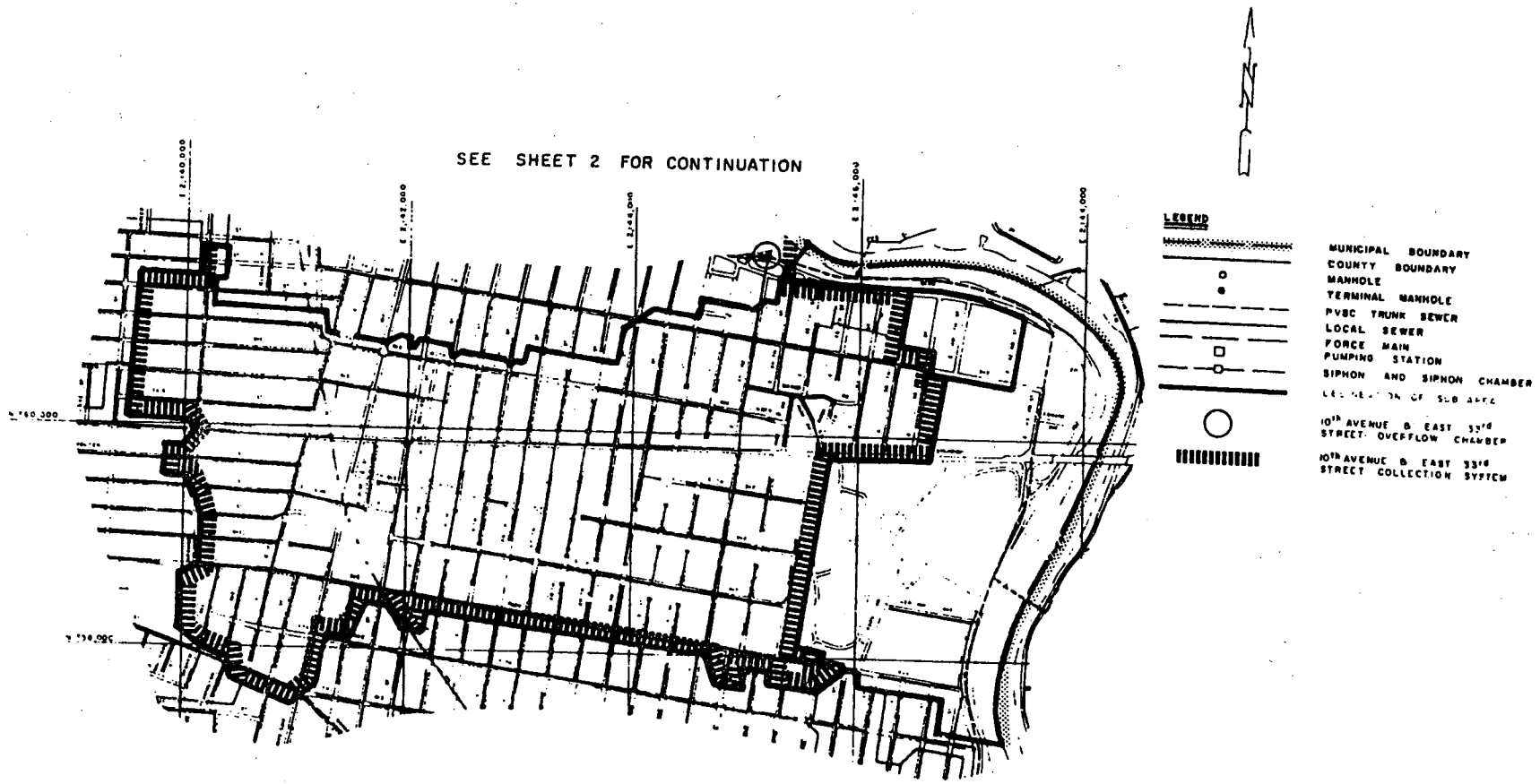

TO P.V.S.C. MAIN INTERCEPTOR
THIRTY-THIRD ST. INTERCEPTOR
12" X 36" REGULATOR VALVE
TENTH AVENUE INTERCEPTOR
SANDCATCHER CHAMBER
24" ø FLAP VALVE
REGULATOR/ FLOAT CHAMBER
STOP LOGS
TIDE GATE CHAMBERS
OUTFALL TO RIVER
PASSAIC RIVER
LEGEND
DRY WEATHER FLOW
STORM FLOW/OVERFLOW
KLL001753
10th AVENUE & EAST 33rd STREET, PATERSON
SCHEMATIC

PLATE C



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

10th AVENUE & EAST 33rd STREET, PATERS

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

SHEET 1 OF 2 PLATE D

(6A)

KLL001736

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

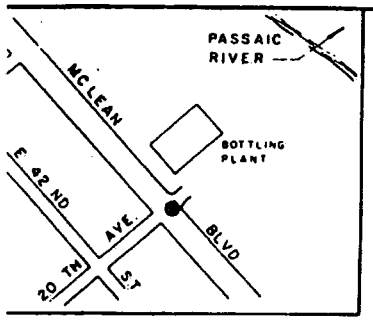
PASSAIC RIVER OVERFLOWS

TWENTIETH AVENUE, PATERSON
P-026

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

KLL001735



LOCATION PLAN

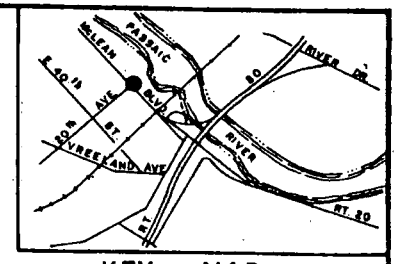
SCALE IN FEET

NOTE:

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

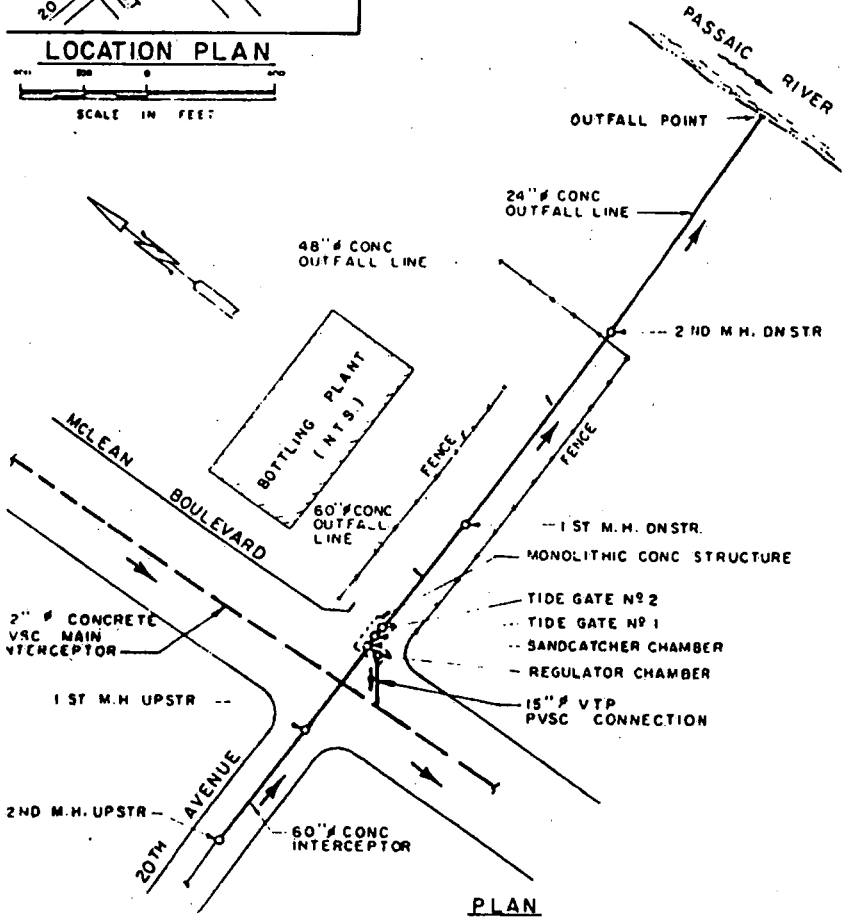
LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR = UPSTREAM
DN STR = DOWNSTREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



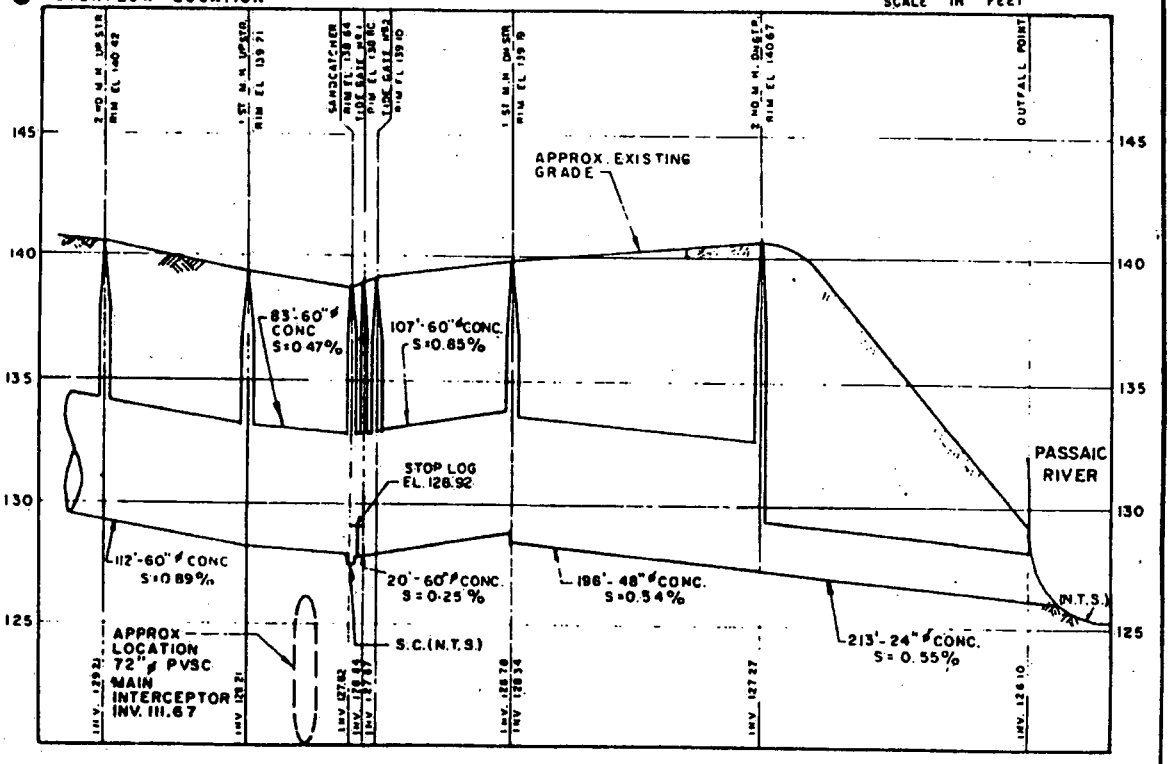
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

...L ELEVATIONS BASED ON ...M, Nº 38 AS ESTABLISHED BY ... & ASSOCIATES ...OR LOCATION AND DESCRIPTION ...E APPENDIX.

KLL001736

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-026

TWENTIETH AVENUE, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE A

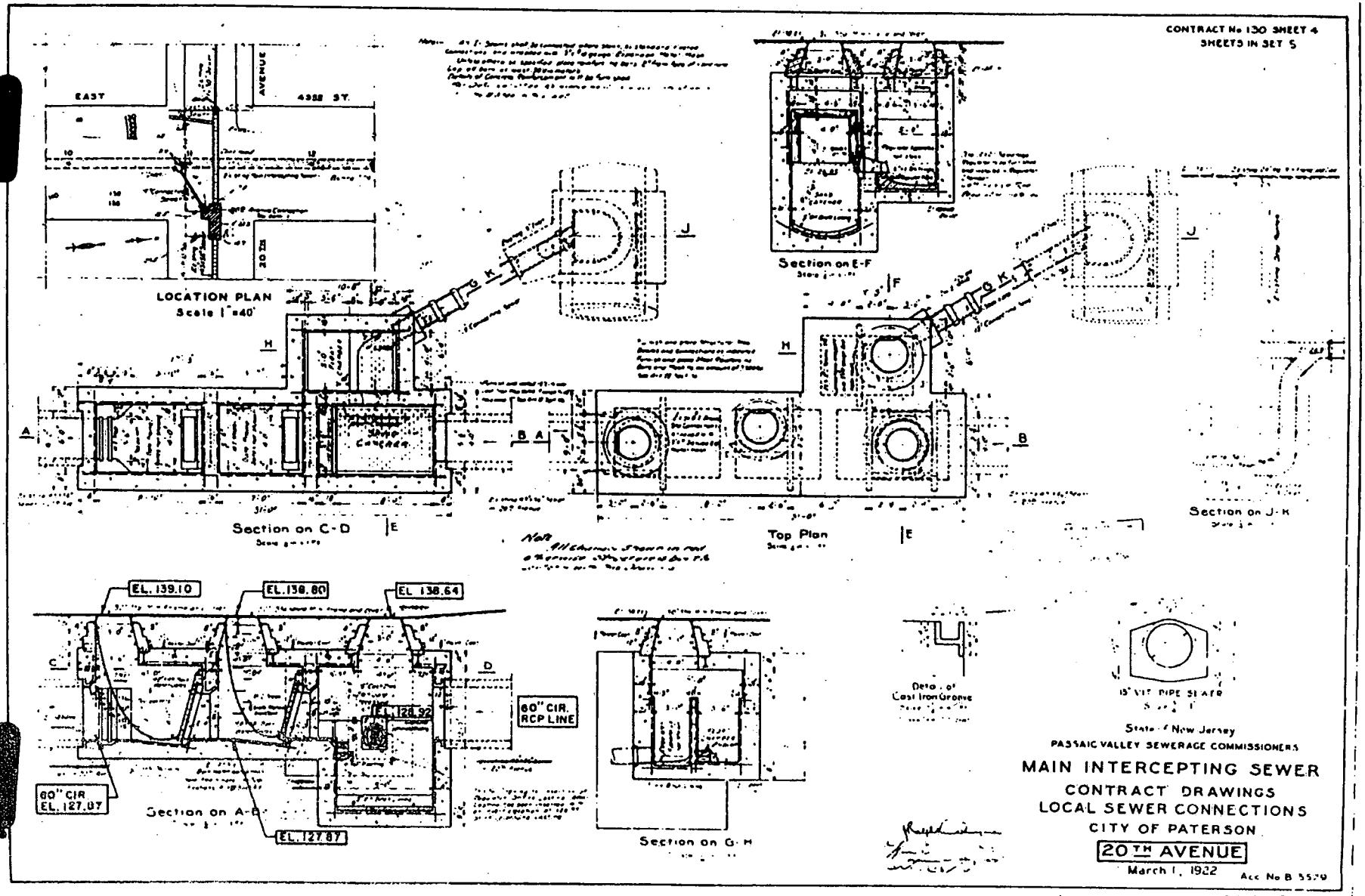
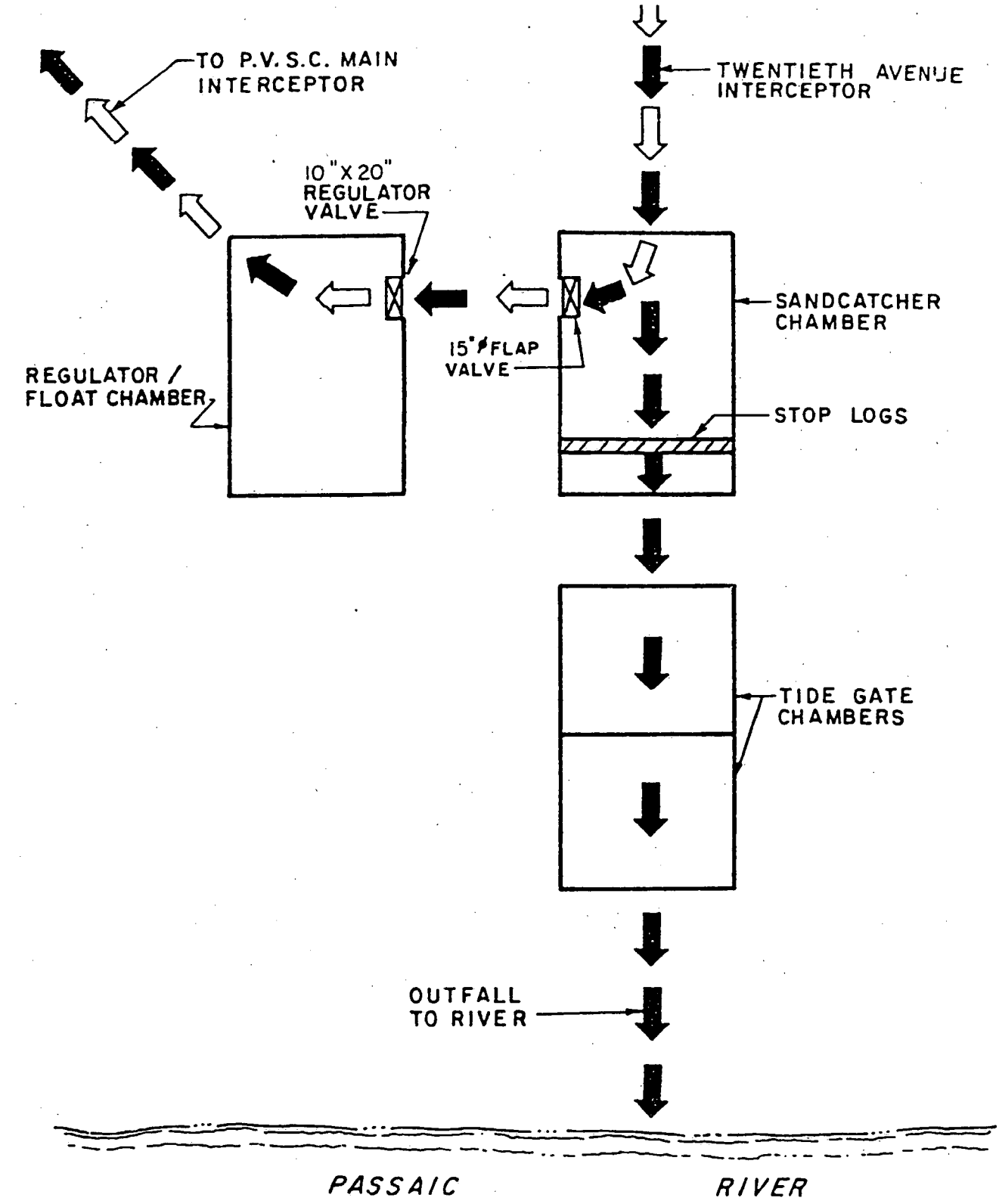


PLATE B

(3)

KLL001737



KLL001738

LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

PASSAIC VALLEY SEWERAGE COMMISSIONERS

TWENTIETH AVENUE, PATERSON

SCHEMATIC

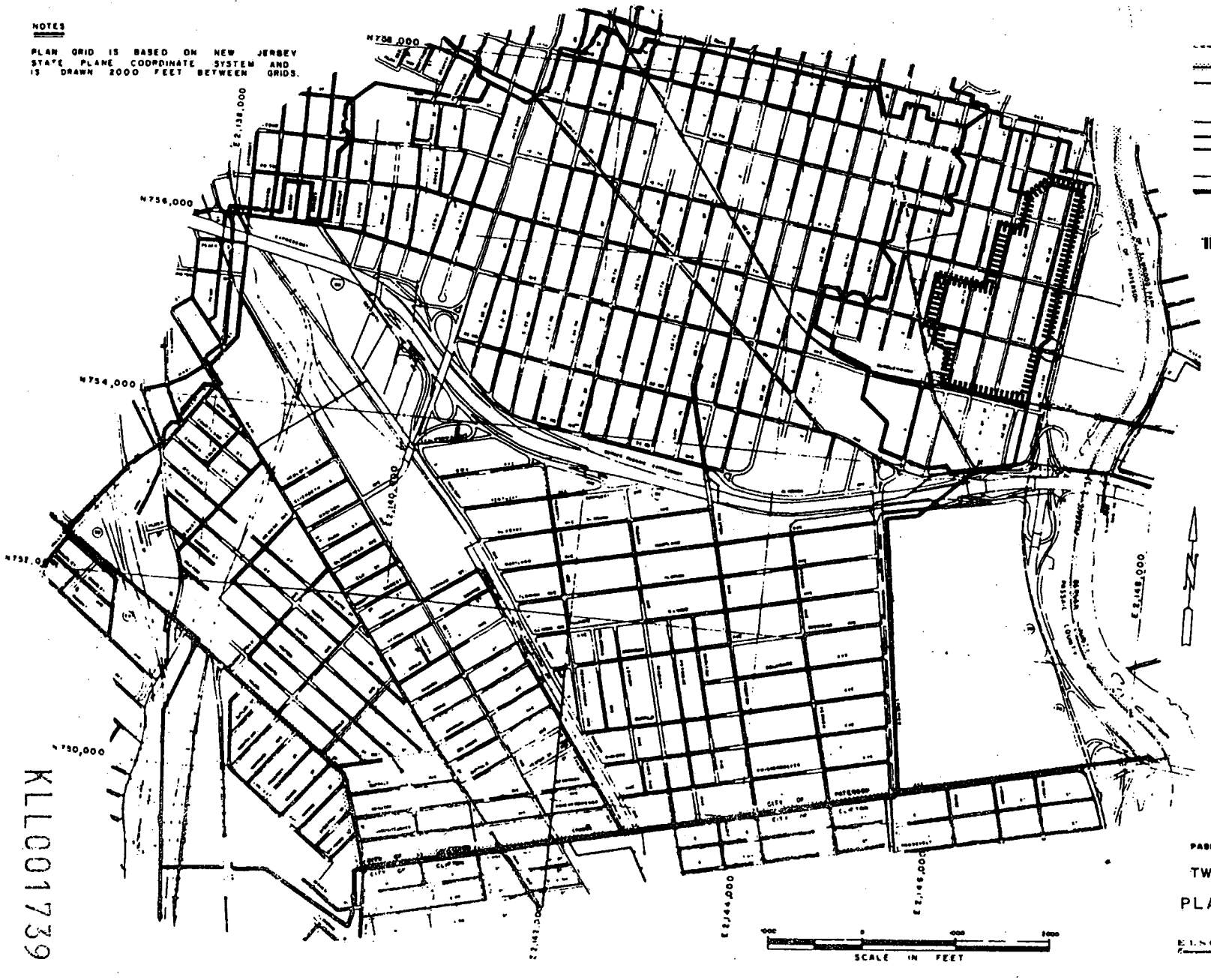
ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE C

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.



MUNICIPAL BOUNDARY
COUNTY BOUNDARY
MANHOLE
TERMINAL MANHOLE
PVSC TRUNK SEWER
LOCAL SEWER
FORCE MAIN
PUMPING STATION
SIPHON AND SIPHON CHAMBER
DELINEATION OF SUB AREA
TWENTIETH AVENUE OVERFLOW CHAMBER
TWENTIETH AVENUE COLLECTION SYSTEM

PASSAIC VALLEY SEWERAGE COMMISSIONERS

TWENTIETH AVENUE, PATERSON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE D

KLL001739

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

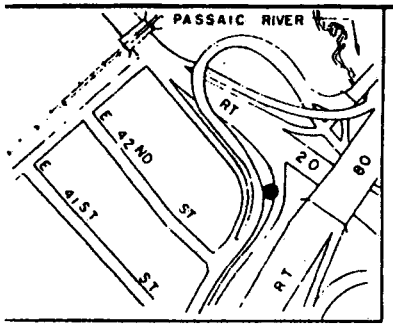
PASSAIC RIVER OVERFLOWS

MARKET STREET, PATERSON
P-027

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers [illegible]

KLL001740



LOCATION PLAN

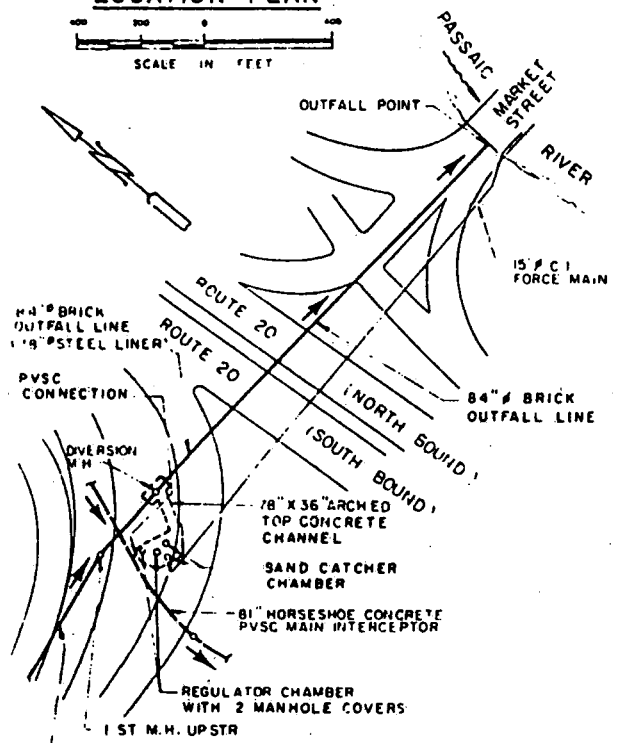
SCALE IN FEET

NOTE

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

LEGEND

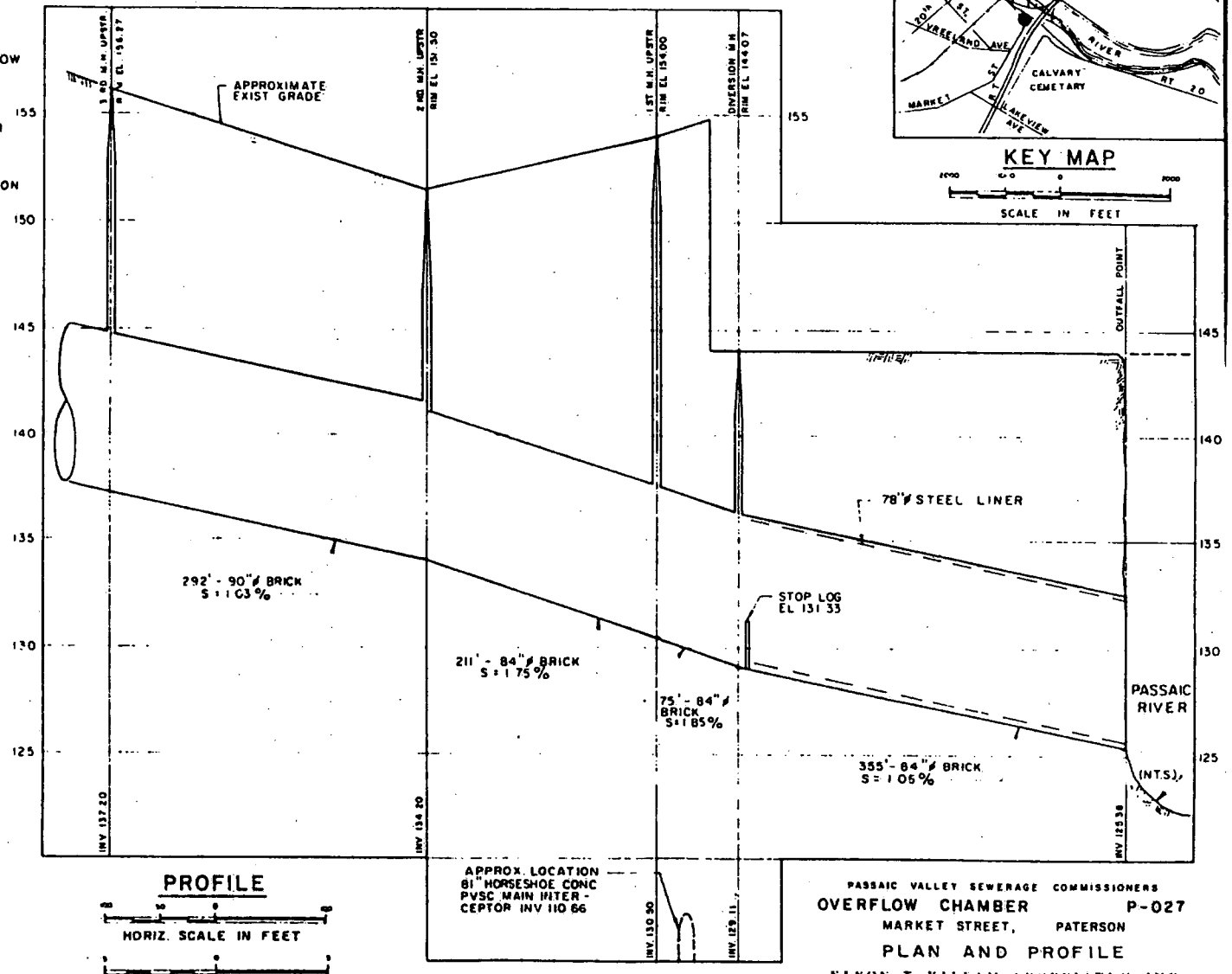
- → DIRECTION OF FLOW
- S.C. = SAND CATCHER
- T.G. = TIDE GATE
- UP STR = UPSTREAM
- DN STR = DOWNSTREAM
- N.T.S. = NOT TO SCALE
- C.I. = CAST IRON
- ● = OVERFLOW LOCATION



PLAN

SCALE IN FEET

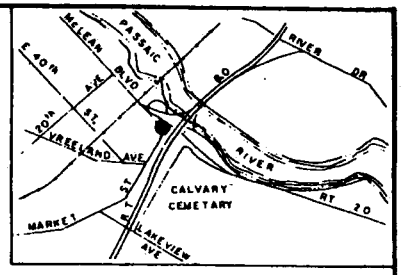
ALL ELEVATIONS BASED ON P.W. No 56 AS ESTABLISHED BY PAUL J. EMILIUS & ASSOCIATES FOR LOCATION AND DESCRIPTION SEE APPENDIX



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET



KEY MAP

SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER P-027

MARKET STREET, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.

PLATE A

KLL001741

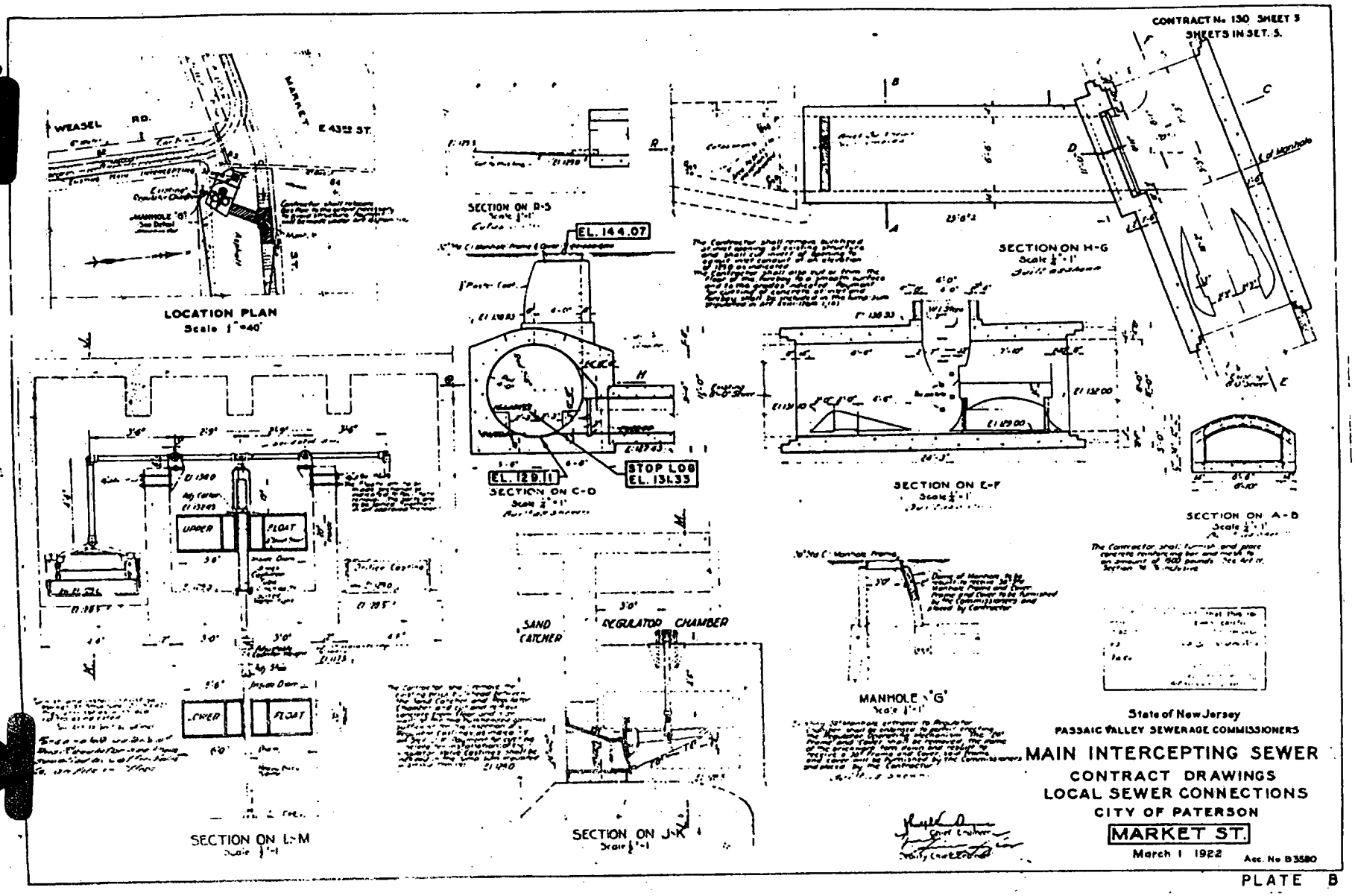
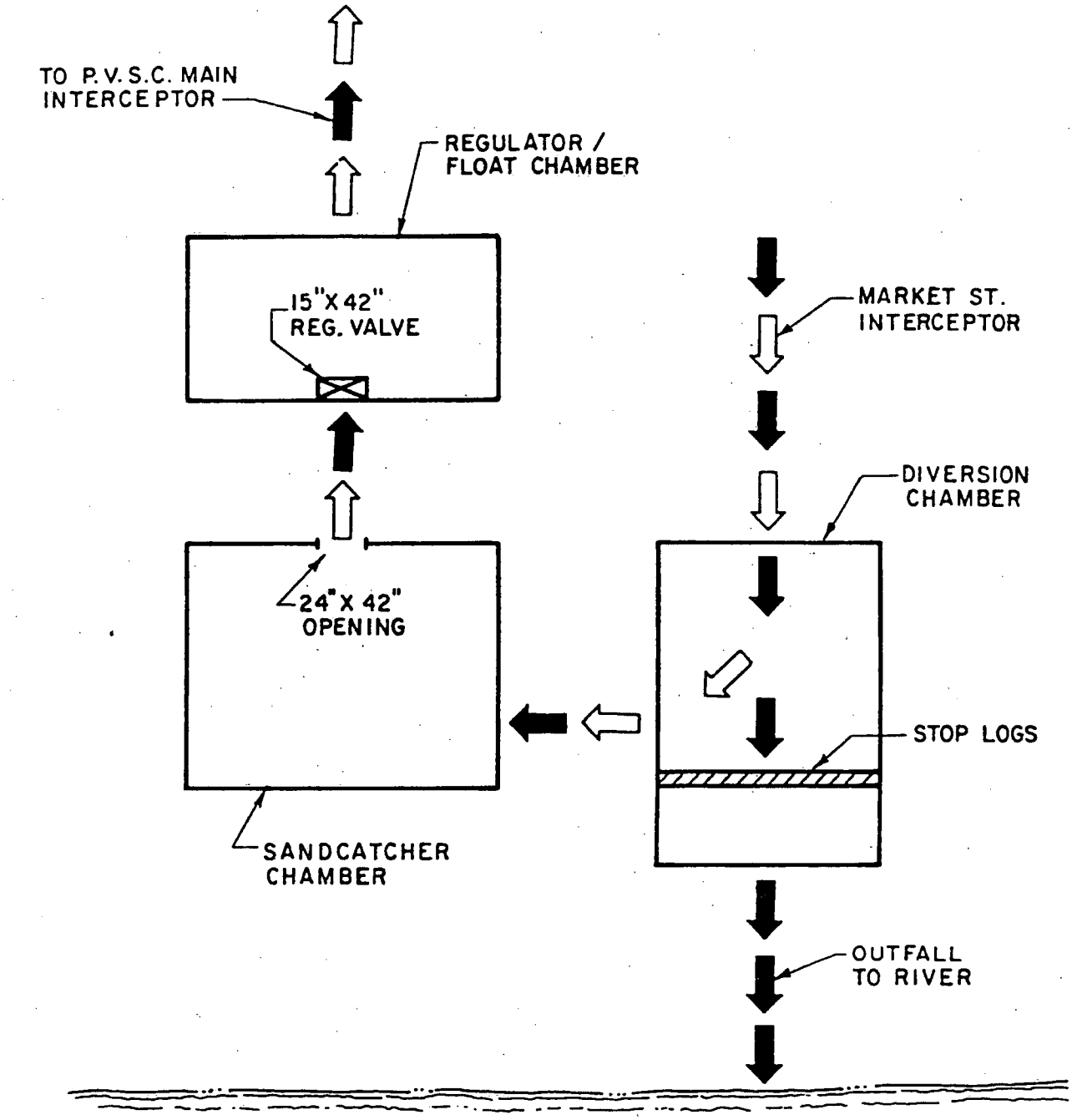


PLATE B

(3)

KLL001742



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001743

PASSAIC VALLEY SEWERAGE COMMISSIONERS

MARKET STREET, PATERSON

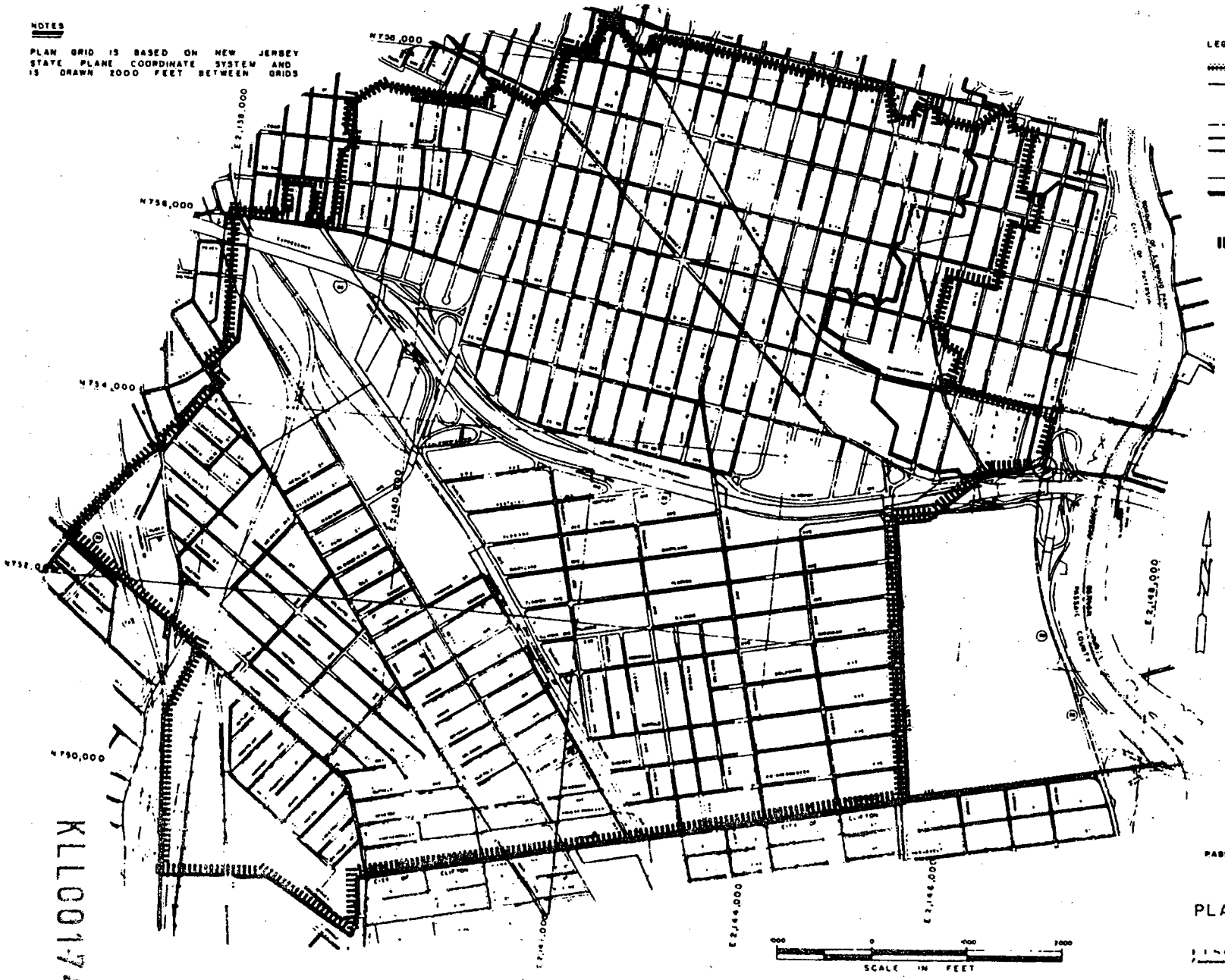
SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS



LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- MARKET STREET OVERFLOW CHAMBER
- MARKET STREET COLLECTION SYSTEM

PASSAIC VALLEY SEWERAGE COMMISSIONERS

MARKET STREET, PATERSON

PLAN OF COLLECTION SYSTEM

PLATE D

KLL001744

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC RIVER OVERFLOWS

HUDSON STREET, PATERSON

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 40 ESSEX STREET MILLBURN NEW JERSEY 07041

KLLC01745

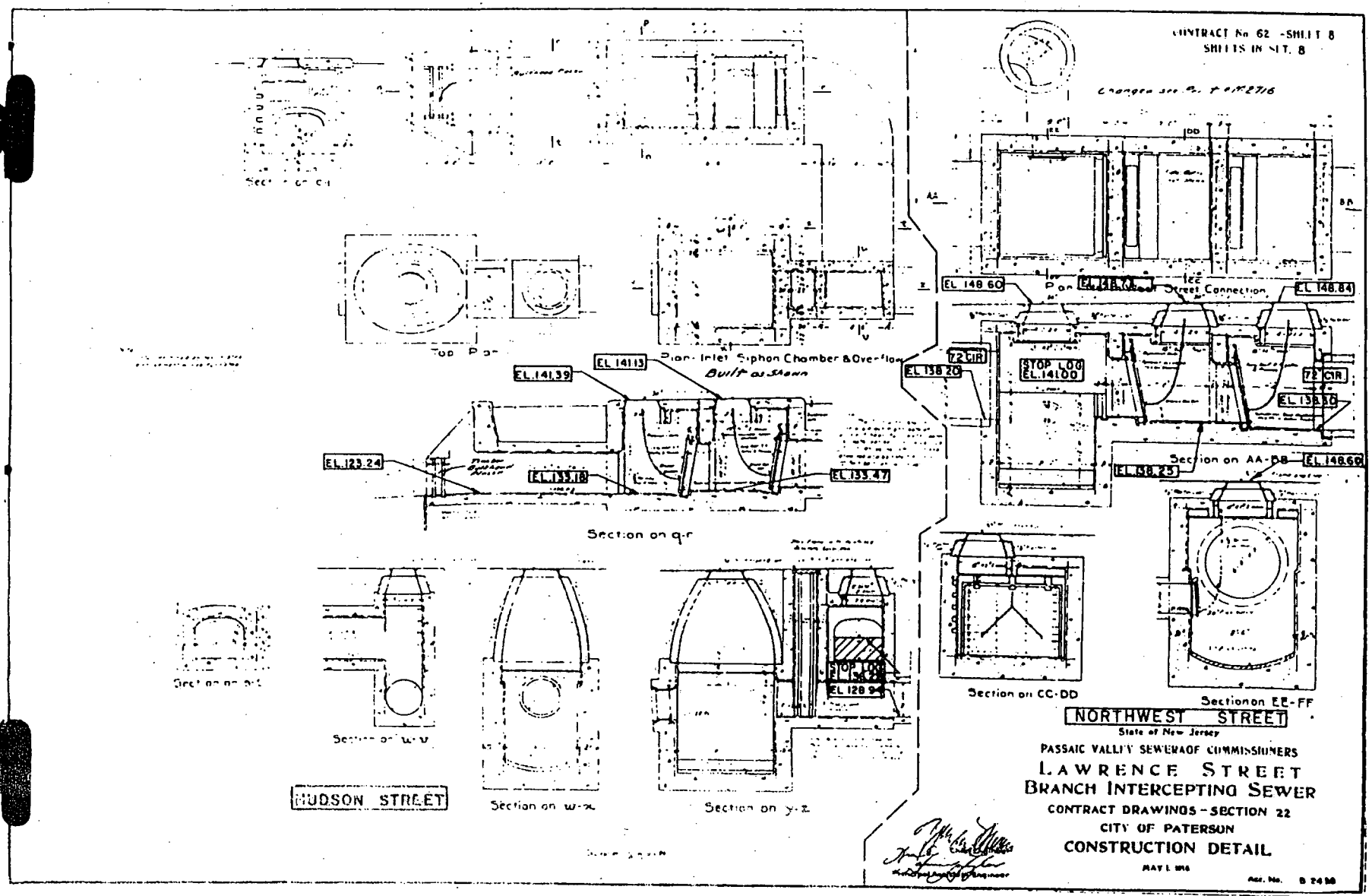
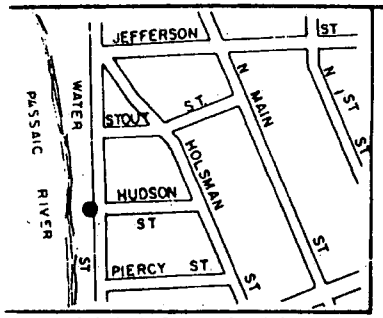


PLATE 8

KLL001746

KLL001747

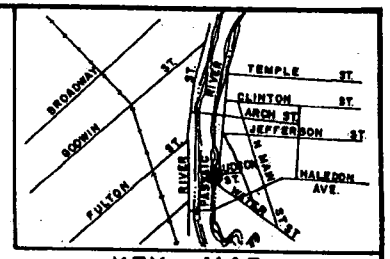


LOCATION PLAN

SCALE IN FEET

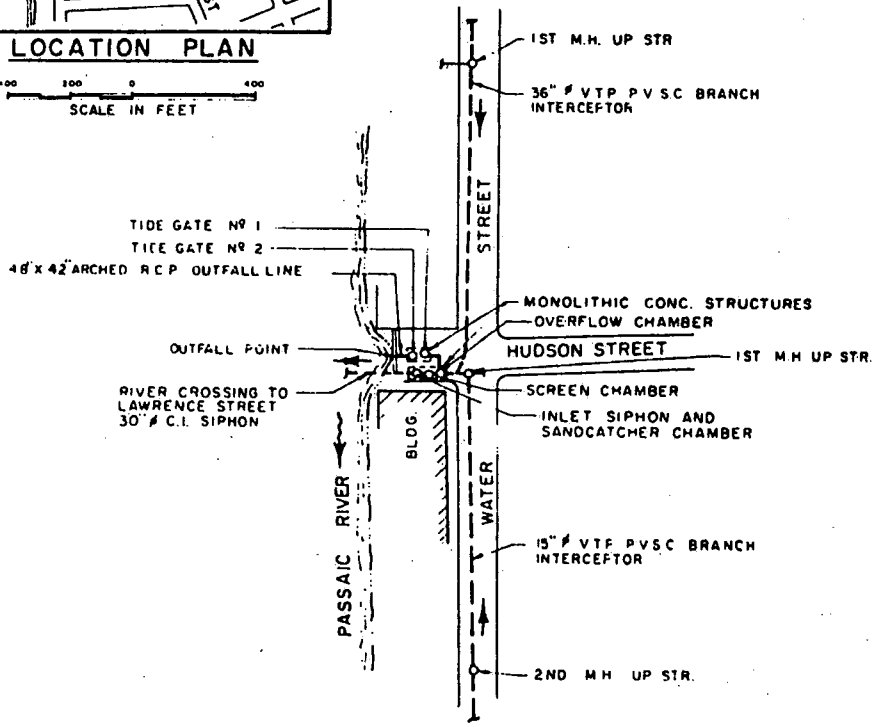
NOTE:
1) ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.
2) REGULATOR CHAMBER IS LOCATED ACROSS RIVER AT LAWRENCE STREET

LEGEND:
- → DIRECTION OF FLOW
- S.C. = SAND CATCHER
- T.G = TIDE GATE
- UP STR. = UP STREAM
- DN STR. = DOWN STREAM
- N.T.S = NOT TO SCALE
- V.T.P = VITRIFIED TILE PIPE
- R.C.P = REINFORCED CONCRETE PIPE
- C.I. = CAST IRON
- ● = OVERFLOW LOCATION



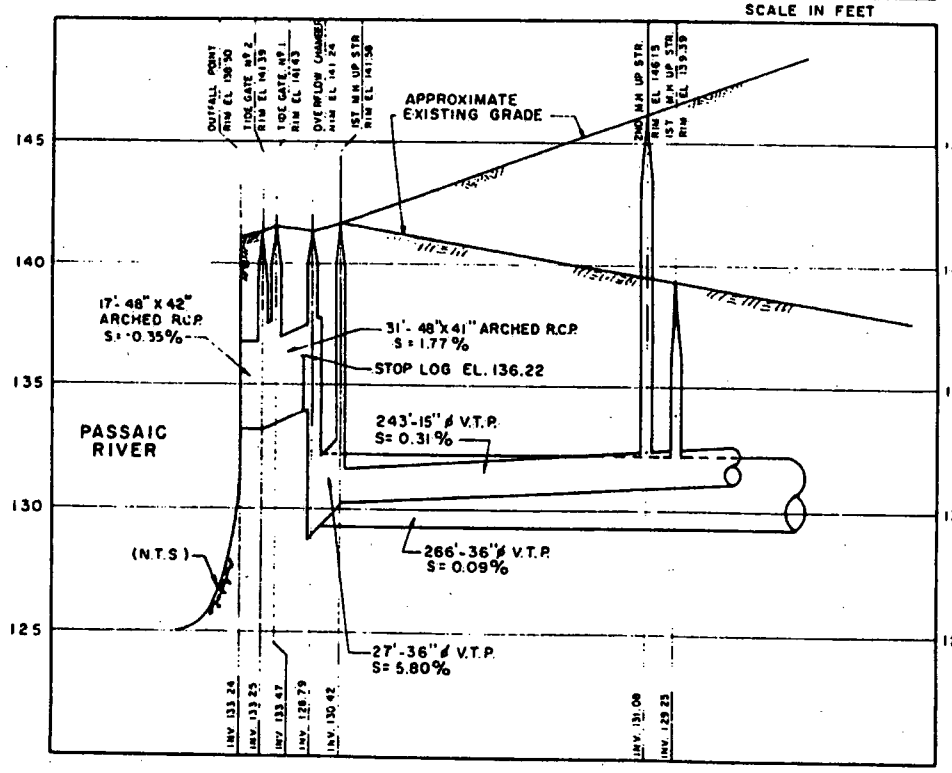
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. Nº 64 AS ESTABLISHED BY PAUL J. EMILUS & ASSOCIATES. FOR LOCATIONS AND DESCRIPTIONS SEE APPENDIX

PASSAIC VALLEY SEWERAGE COMMISSIONERS

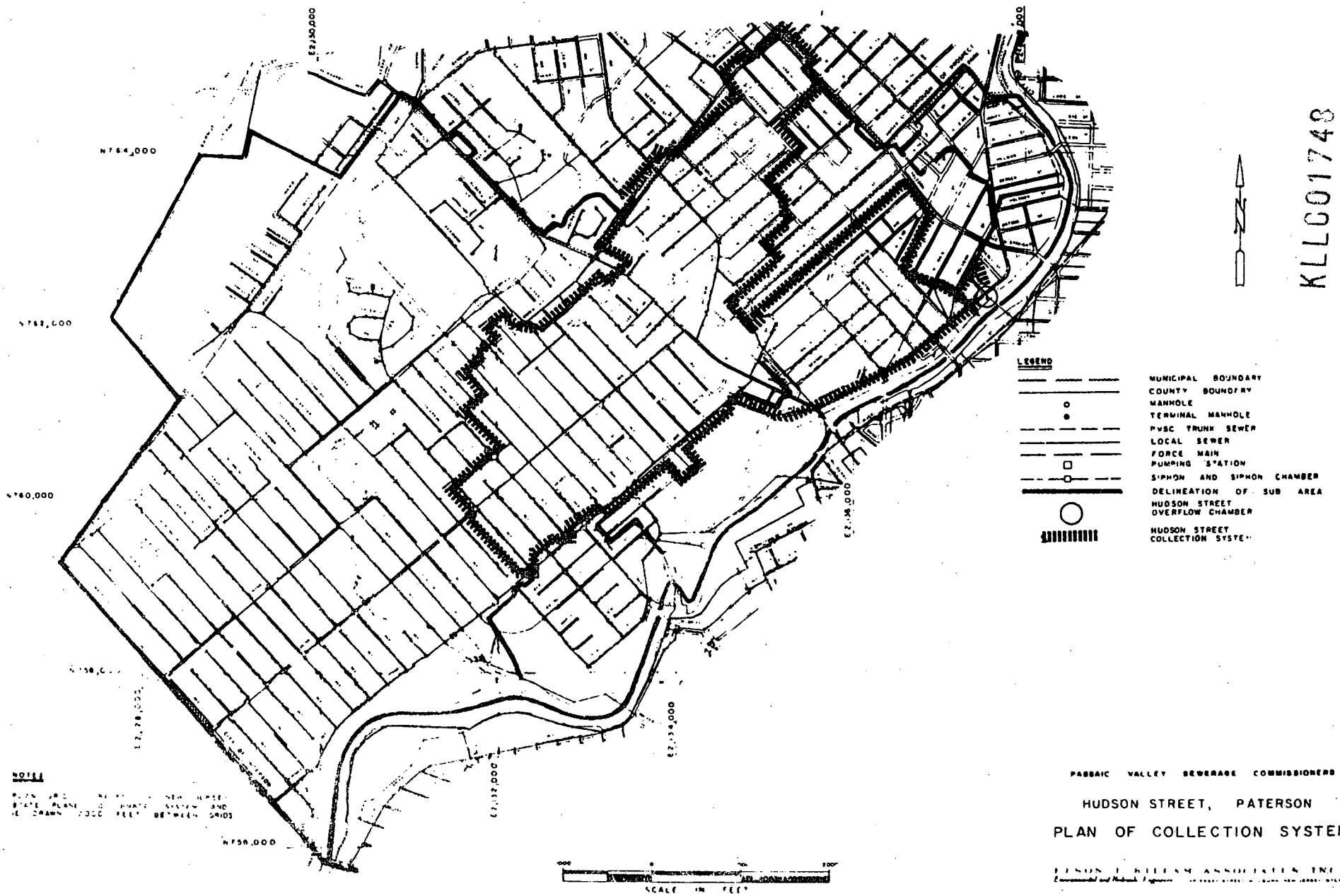
OVERFLOW CHAMBER

HUDSON STREET, PATERSON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.
Consulting and Hydraulic Engineers

PLATE A



PASSAIC VALLEY SEWERAGE COMMISSIONERS

HUDSON STREET, PATERSON

PLAN OF COLLECTION SYSTEM

PLATE D

KLL001748

KLL001749

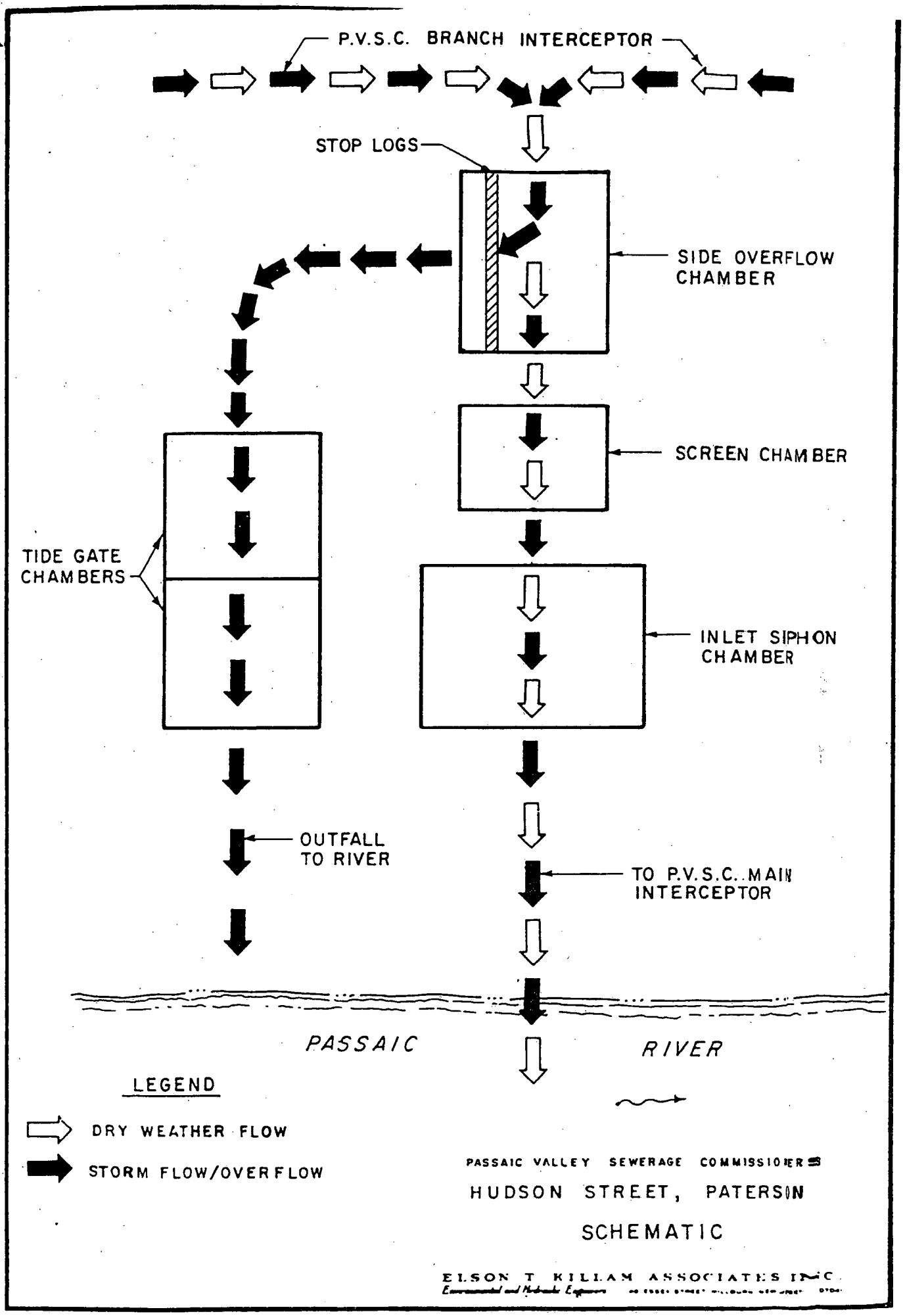
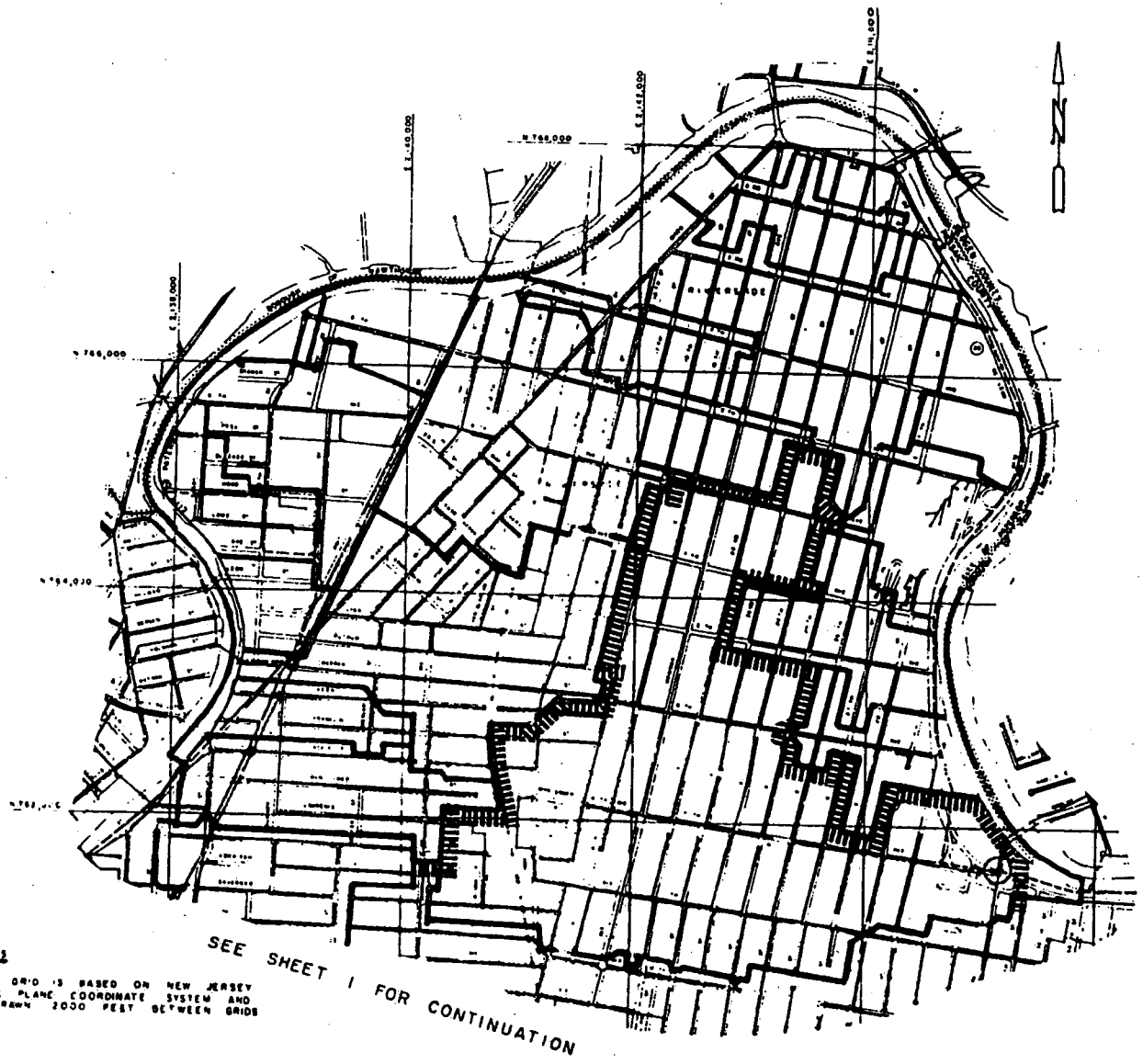


PLATE C



LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- 10th AVENUE & EAST 33rd STREET OVERFLOW CHAMBER
- 10th AVENUE & EAST 33rd STREET COLLECTION SYSTEM

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS

1000 0 1000 2000
SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

10th AVENUE & EAST 33rd STREET, PATERSON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

SHEET 2 OF 2

PLATE D

KLLC01770

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

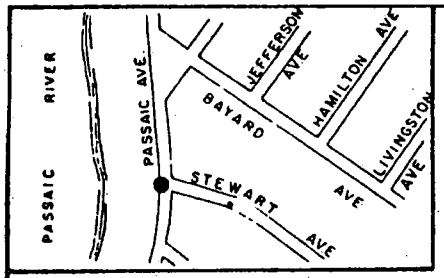
PASSAIC RIVER OVERFLOWS

STEWART AVENUE, KEARNY
K-001

1976

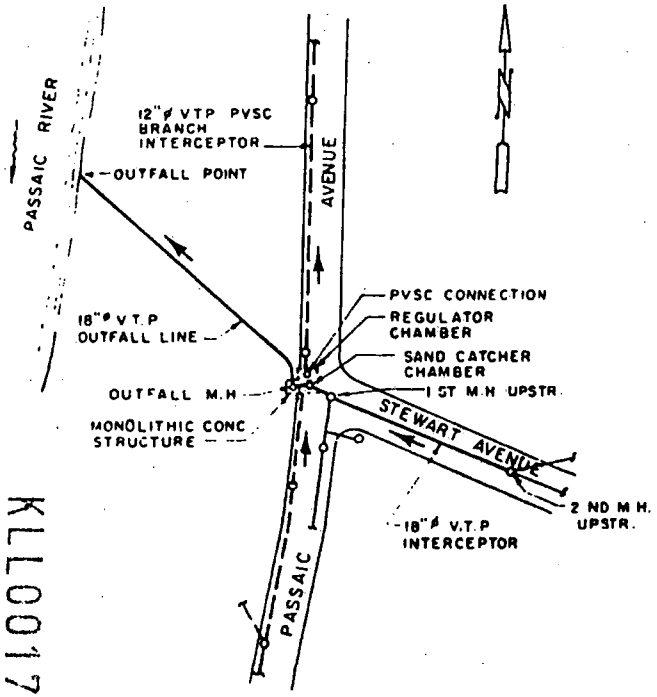
ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001751



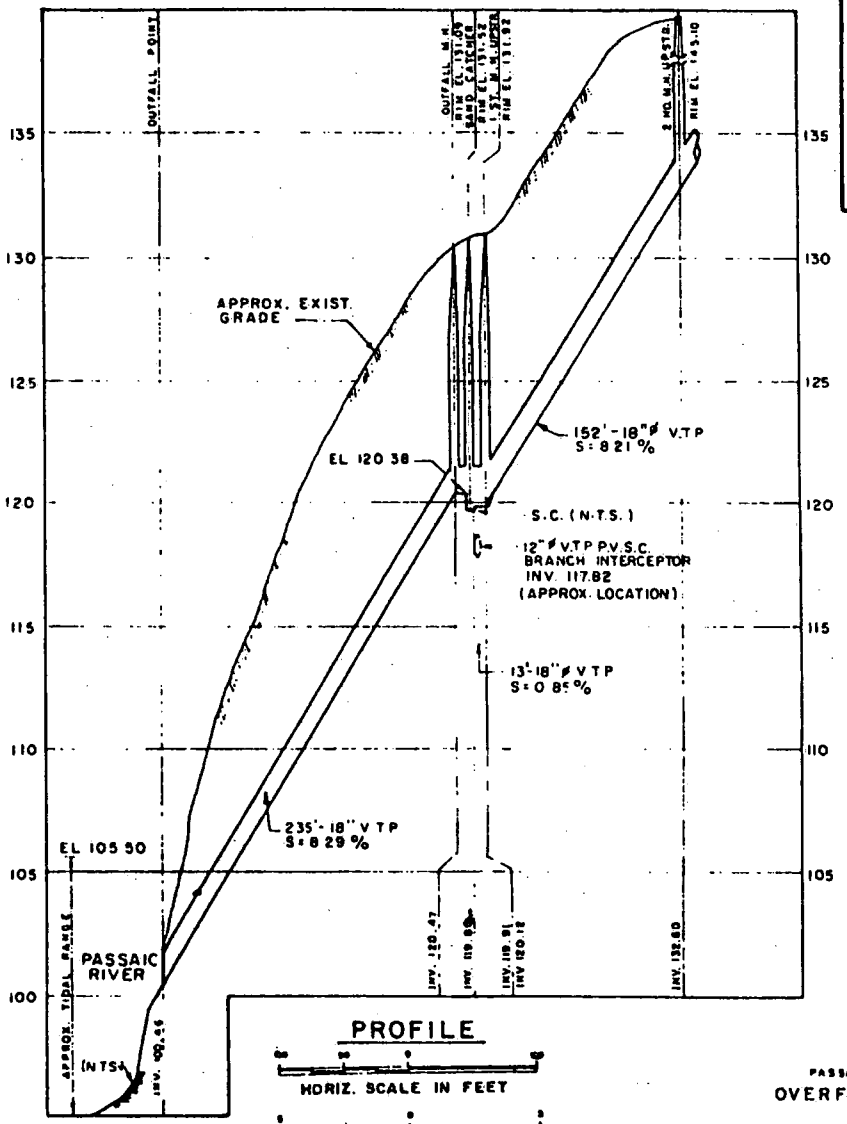
LOCATION PLAN

SCALE IN FEET



PLAN

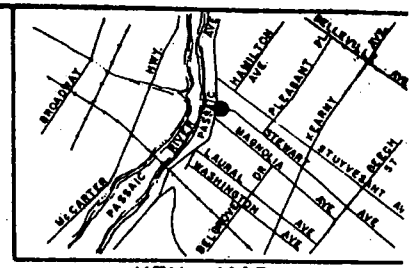
SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET



KEY MAP

SCALE IN FEET

NOTE

ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UPSTREAM
DN. STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION

ALL ELEVATIONS BASED ON B.M. No 1279 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER K-001

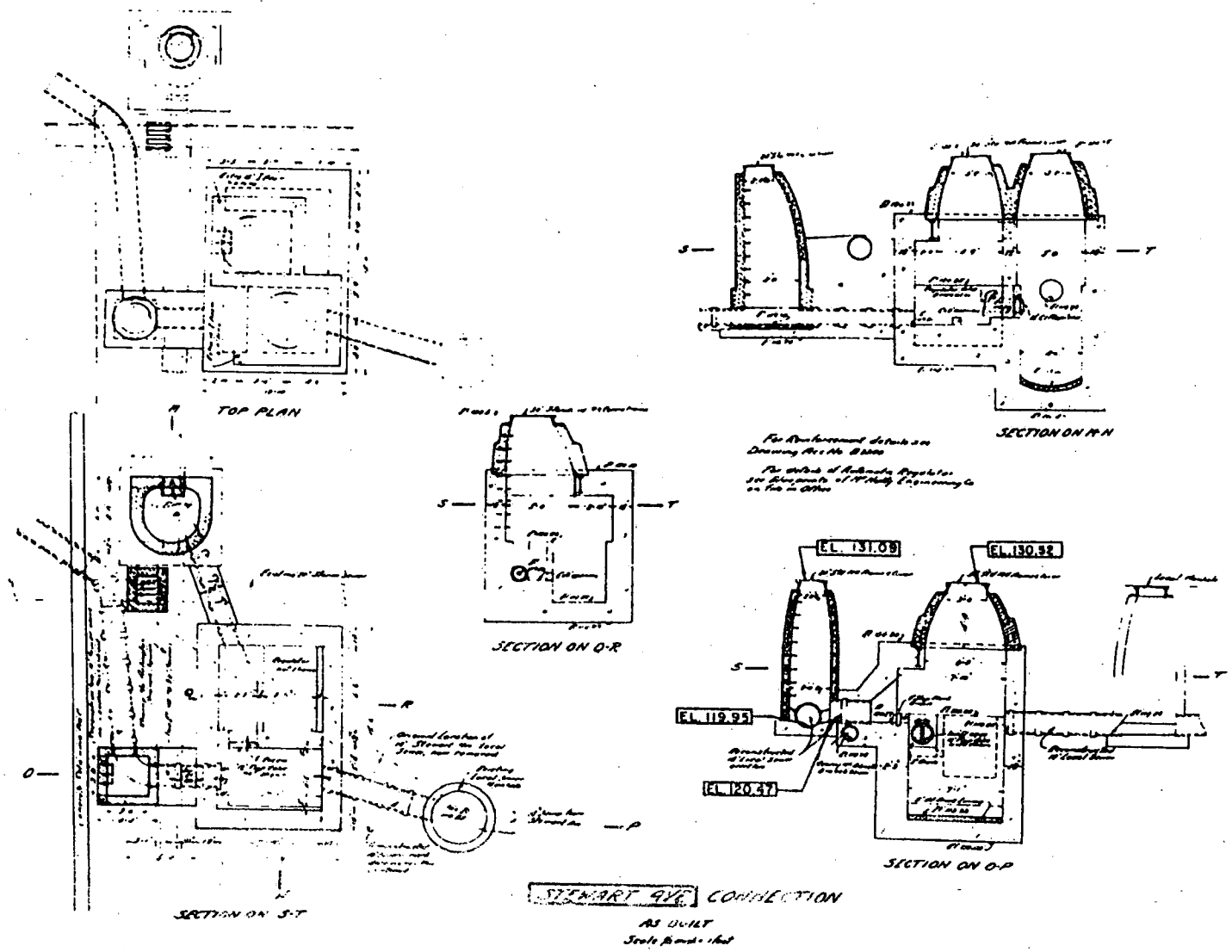
STEWART AVENUE, KEARNY

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.
Environmental and Hydraulic Engineers

PLATE

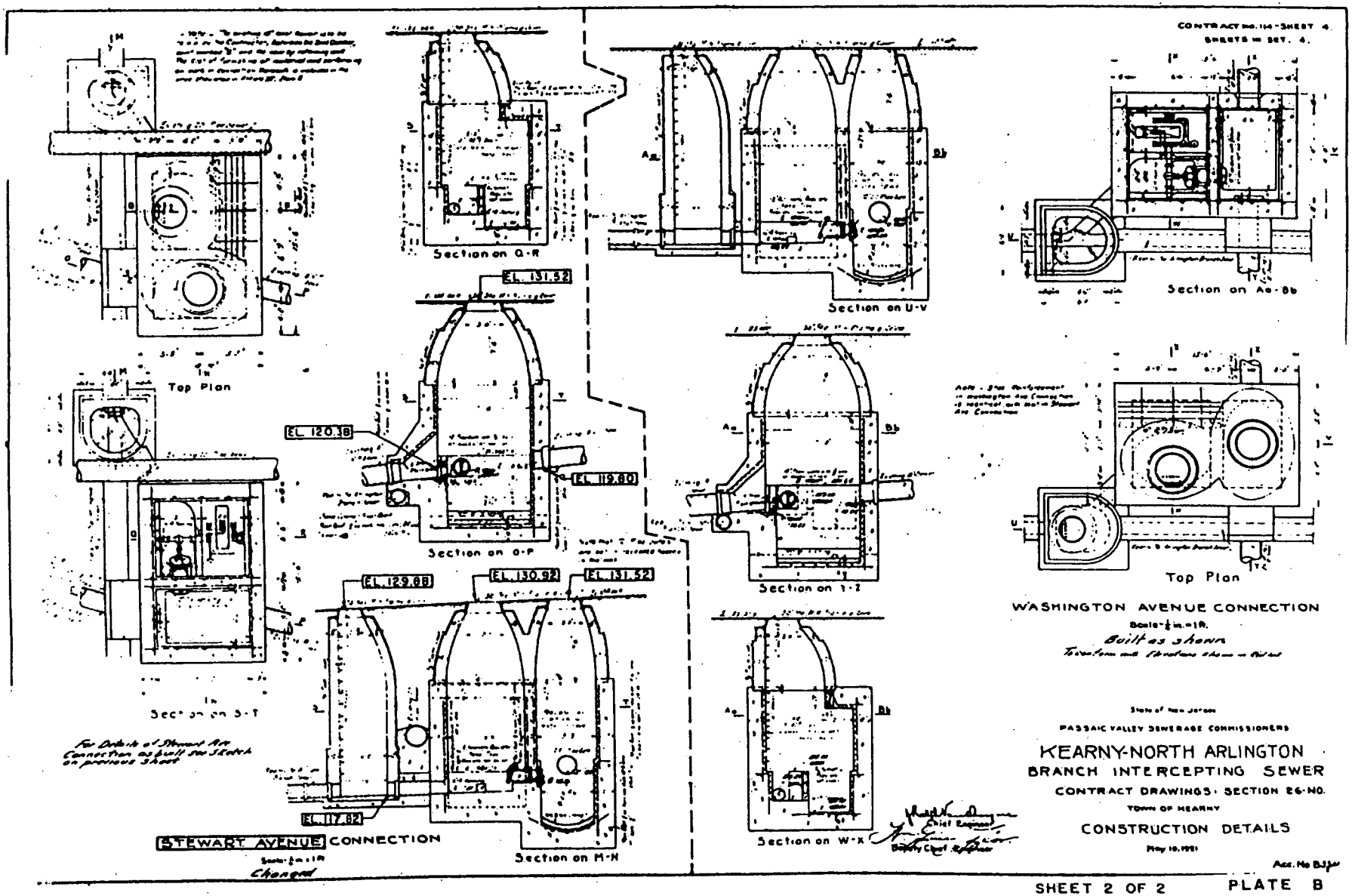
KLL001752



SHEET 1 OF 2 PLATE B

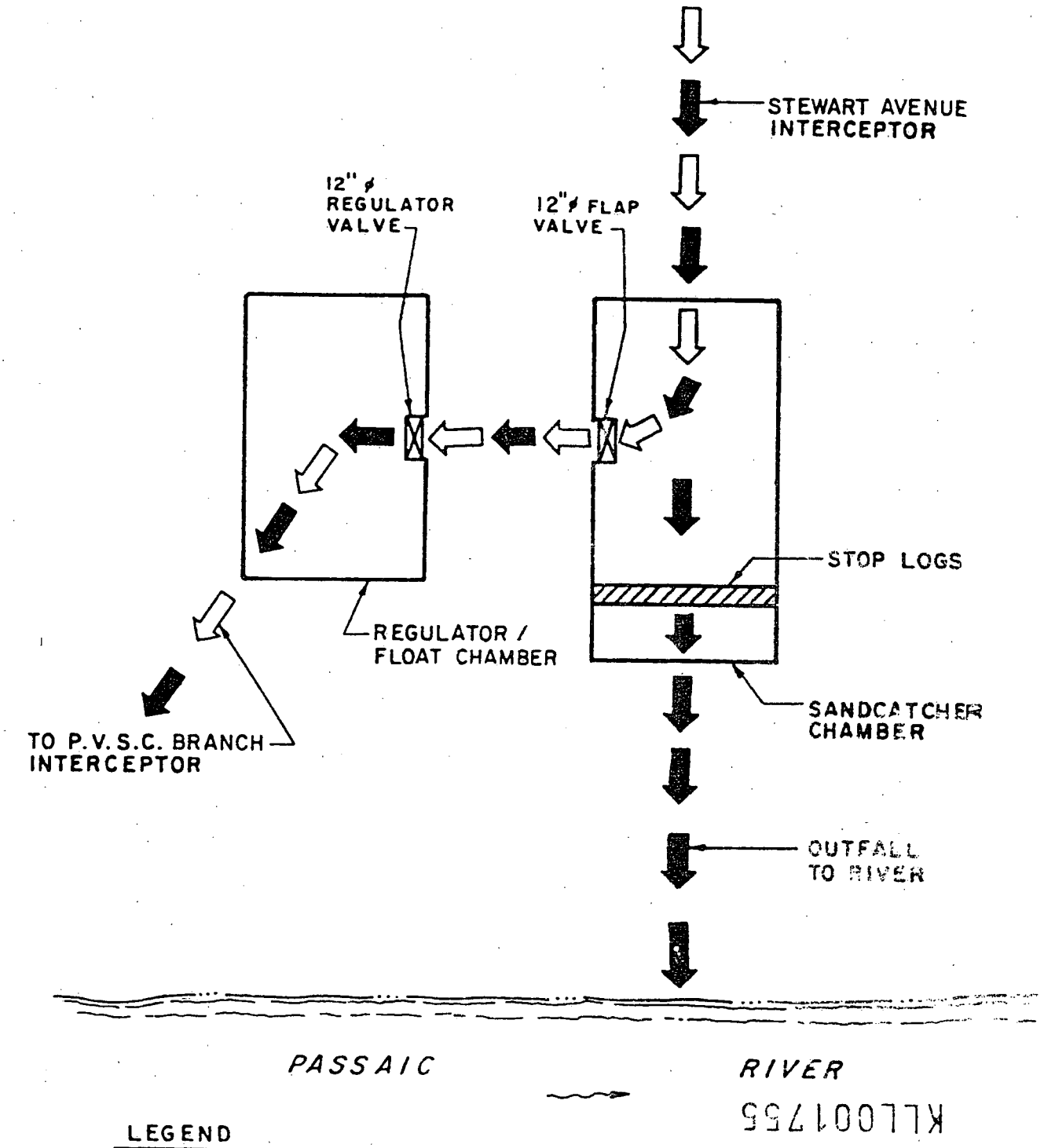
(3A)

KLL001753



(38)

KLL001754



KLL001755

LEGEND

DRY WEATHER FLOW

STORM FLOW / OVERFLOW

PASSAIC VALLEY SEWERAGE COMMISSIONERS

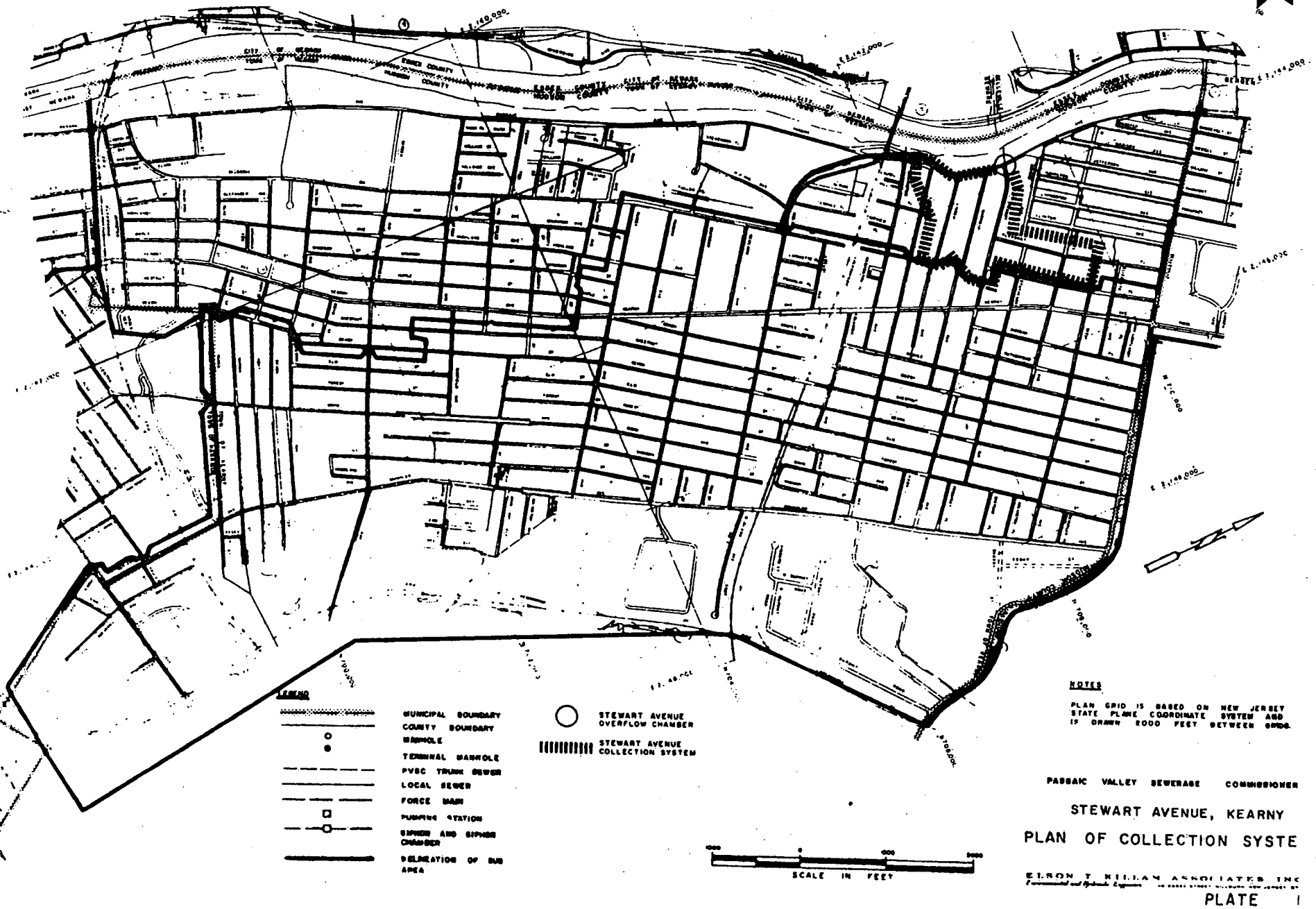
STEWART AVENUE, KEARNY

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE C


LEGEND
MUNICIPAL BOUNDARY
COUNTY BOUNDARY
MANHOLE
TERMINAL MANHOLE
PVSC TRUNK SEWER
LOCAL SEWER
FORCE MAIN
PUMPING STATION
SIPHON AND SIPHON CHAMBER
DELIEATION OF SUB AREA
STEWART AVENUE OVERFLOW CHAMBER
STEWART AVENUE COLLECTION SYSTEM
SCALE IN FEET
NOTES
PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.
PASSAIC VALLEY SEWERAGE COMMISSIONER
STEWART AVENUE, KEARNY
PLAN OF COLLECTION SYSTE
ELSON T. KILLAM ASSOCIATES INC
PLATE

KLL001756

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

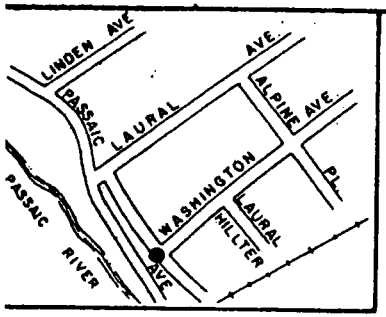
PASSAIC RIVER OVERFLOWS

WASHINGTON AVENUE, KEARNY
K-982

1976

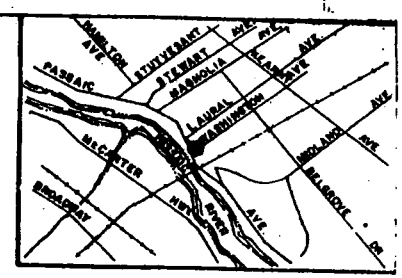
ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001757



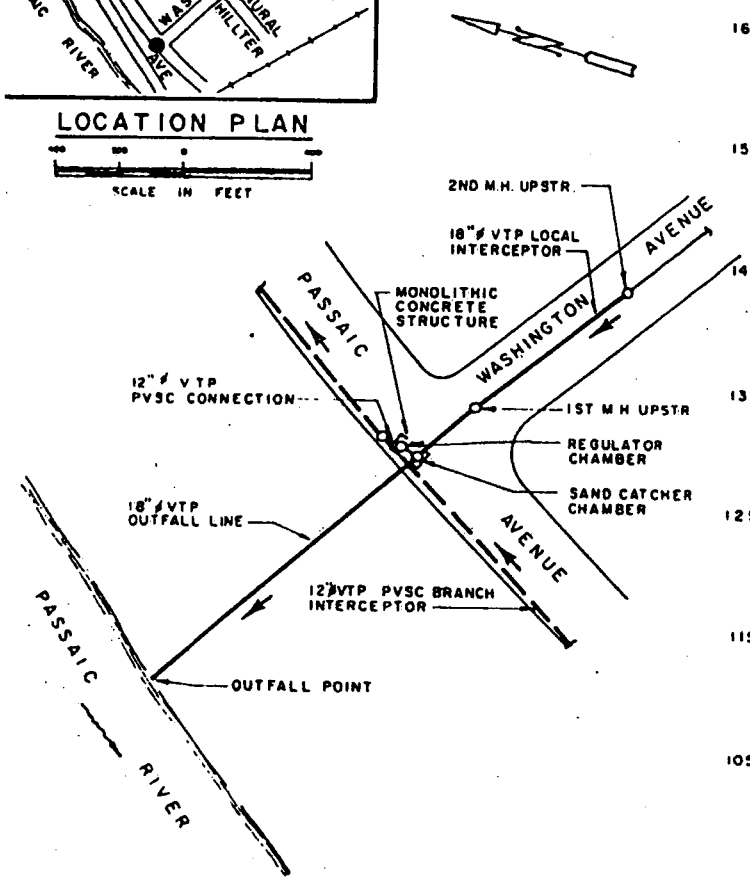
LOCATION PLAN

SCALE IN FEET



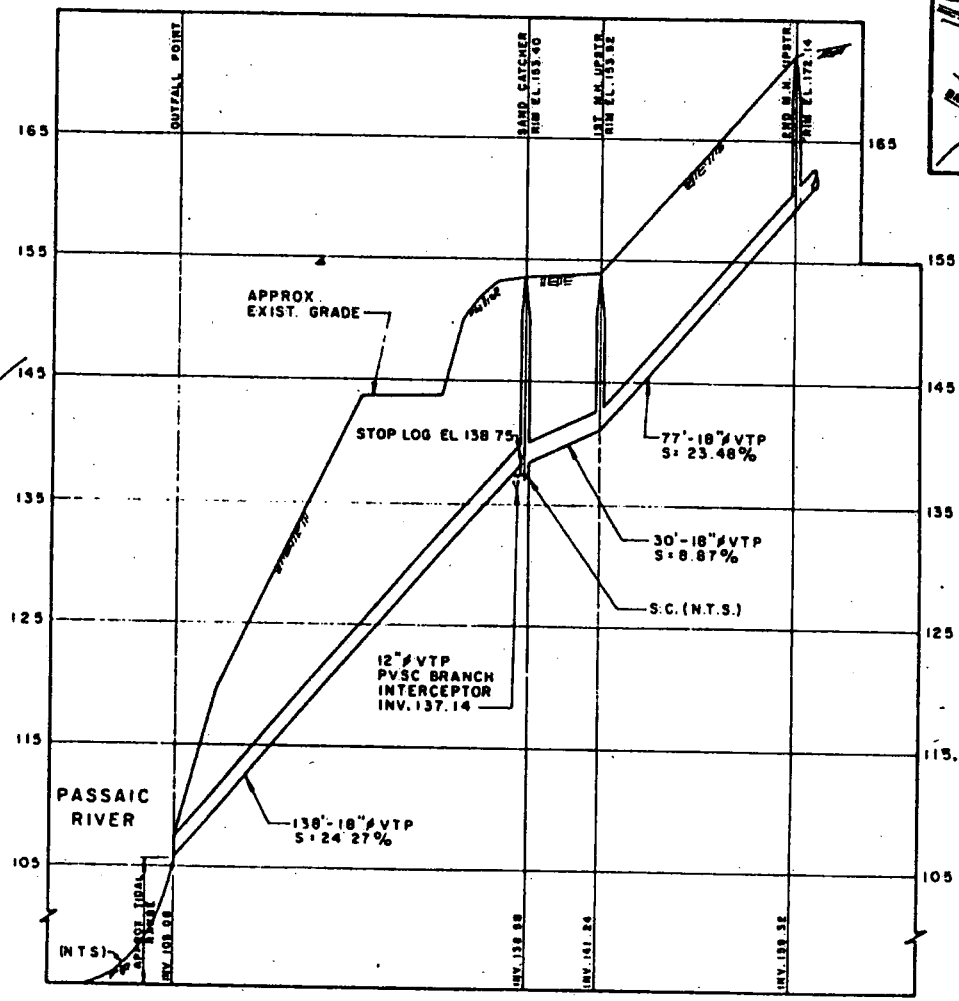
KEY MAP

SCALE IN FEET



PLAN

HORIZ. SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

NOTE:

ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UPSTREAM
DN. STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION

L ELEVATIONS BASED ON
AL 1970 AS ESTABLISHED BY
W JERSEY GEODETIC CONTROL SURVEY
LOCATION AND DESCRIPTION
E APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER K-002

WASHINGTON AVENUE, KEARNY

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE A

KLL001758

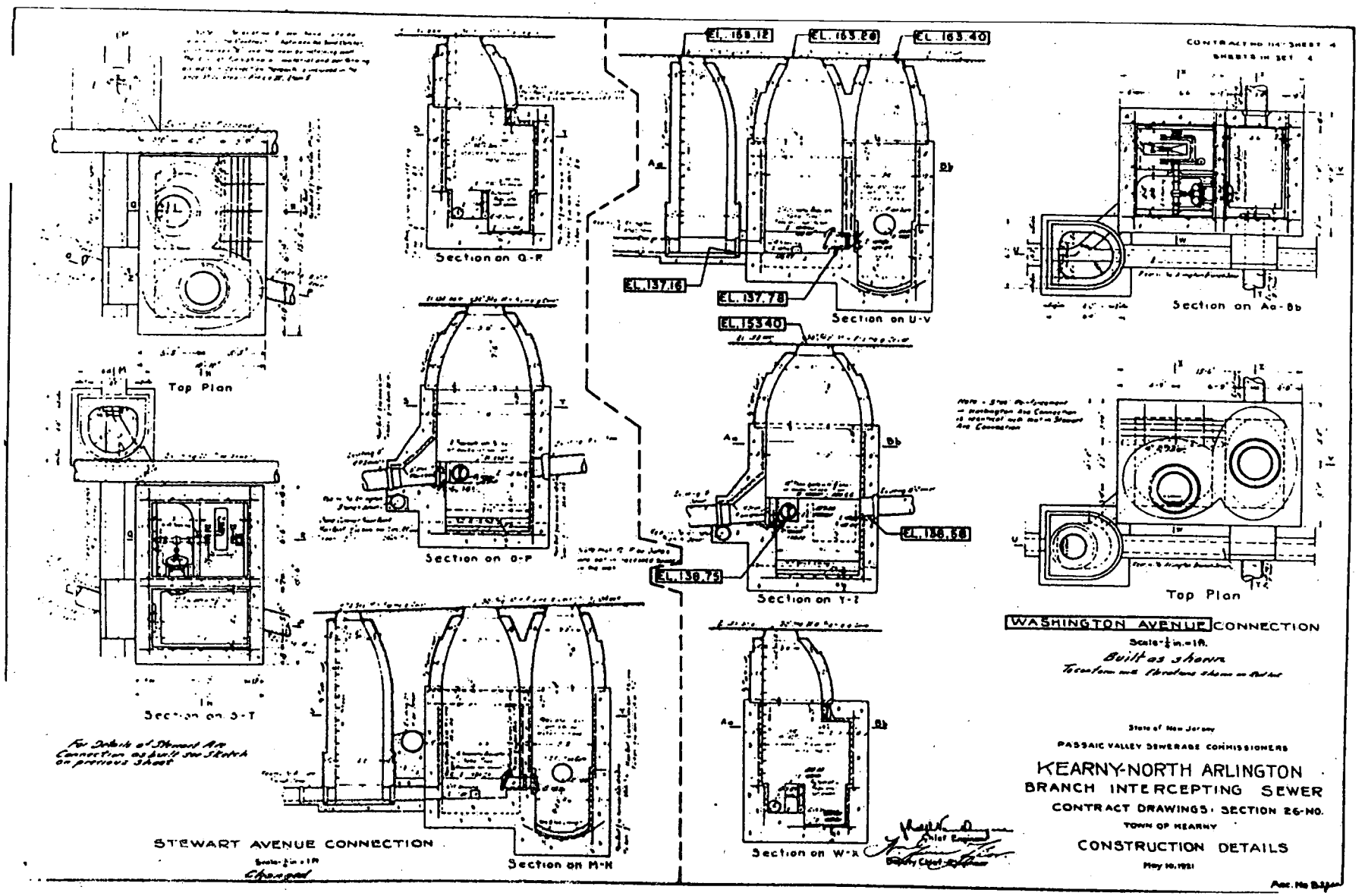
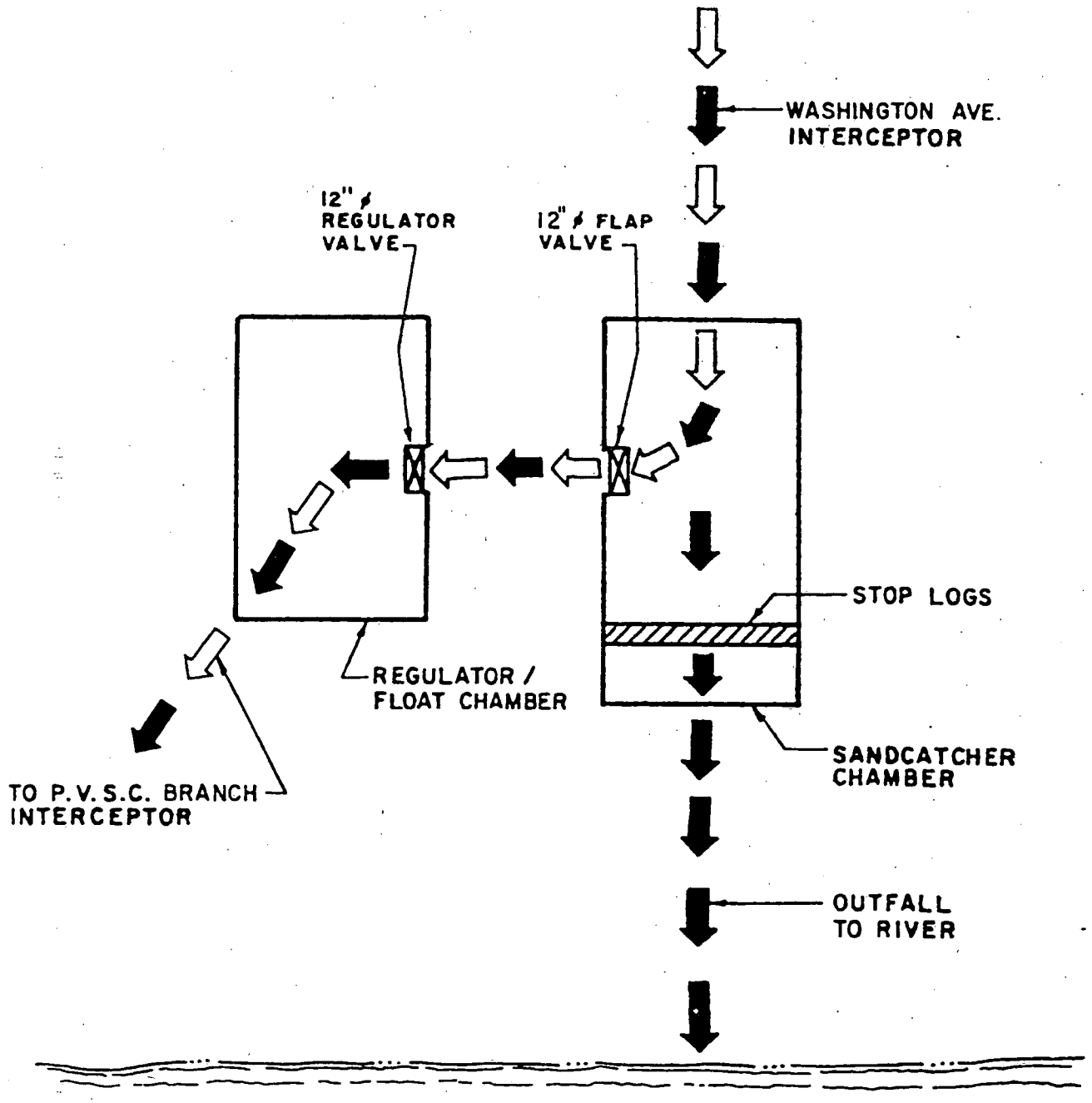


PLATE 8

(3)

KLL001759



LEGEND

DRY WEATHER FLOW

STORM FLOW / OVERFLOW

KLL001760

PASSAIC VALLEY SEWERAGE COMMISSIONERS

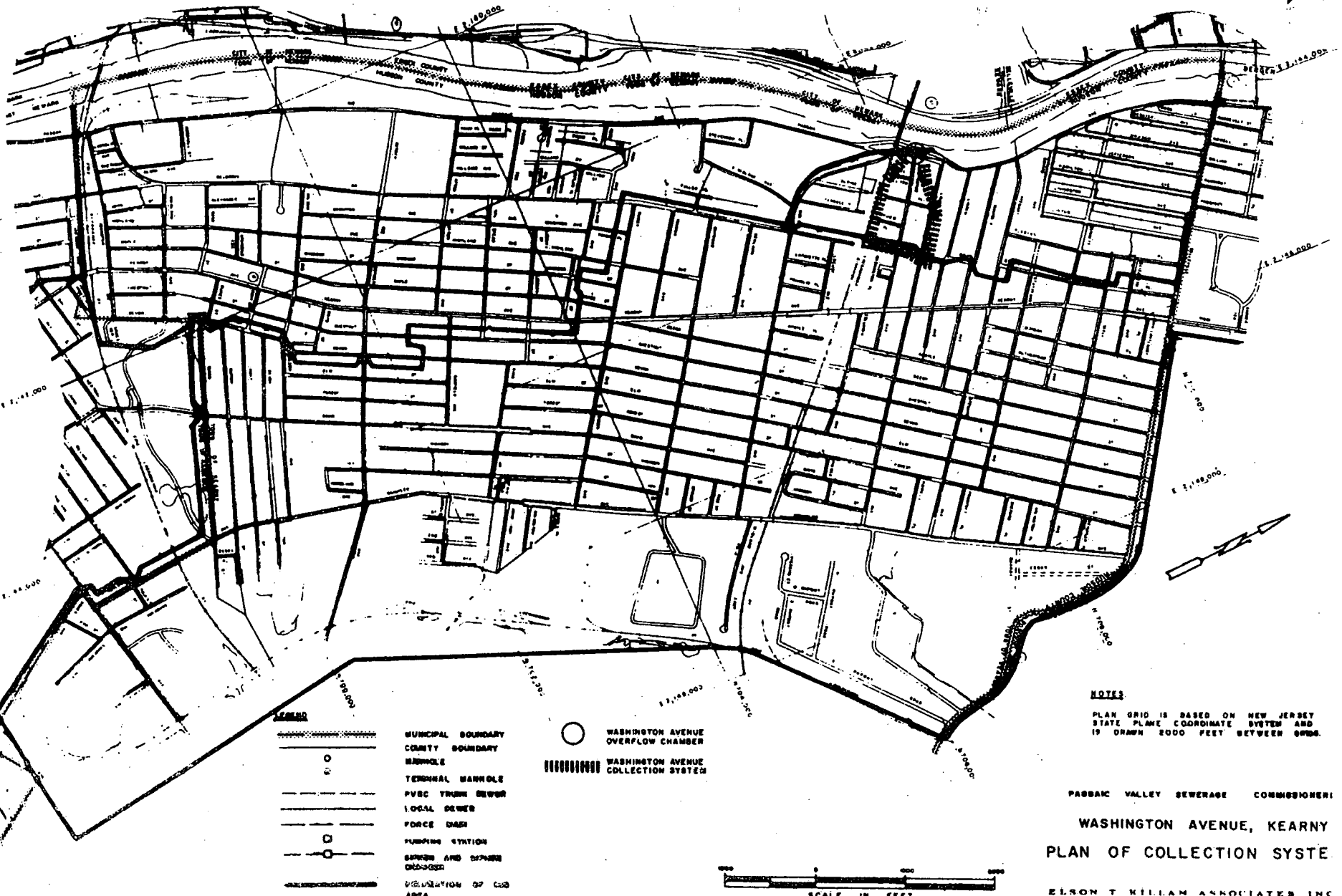
WASHINGTON AVENUE, KEARNY

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

Consulting and Hydraulic Engineers

PLATE C



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

WASHINGTON AVENUE, KEARNY

PLAN OF COLLECTION SYSTE

ELSON T. KILLAM ASSOCIATES INC

PLATE I

KLL001761

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

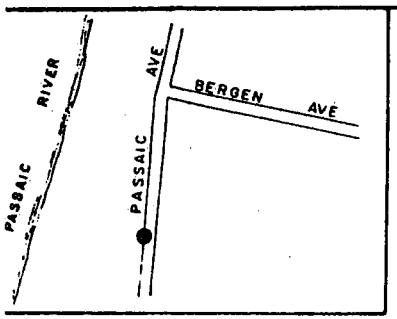
PASSAIC RIVER OVERFLOWS

BERGEN AVENUE, KEARNY
K-003

1976

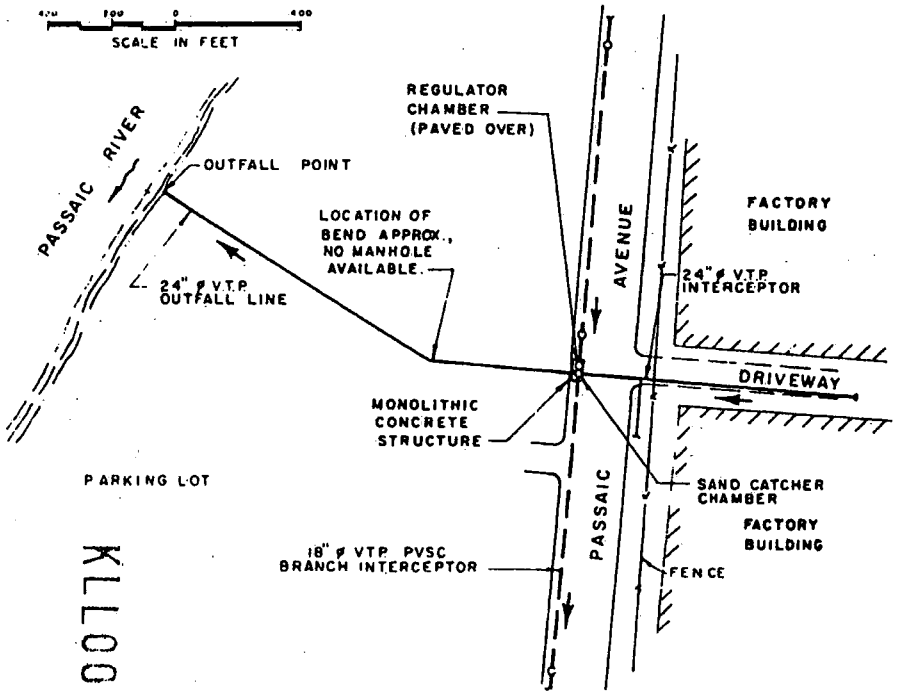
ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

KLLC01762



LOCATION PLAN

SCALE IN FEET

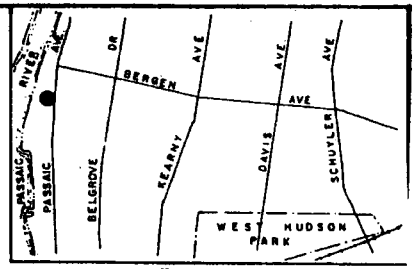


PLAN

SCALE IN FEET

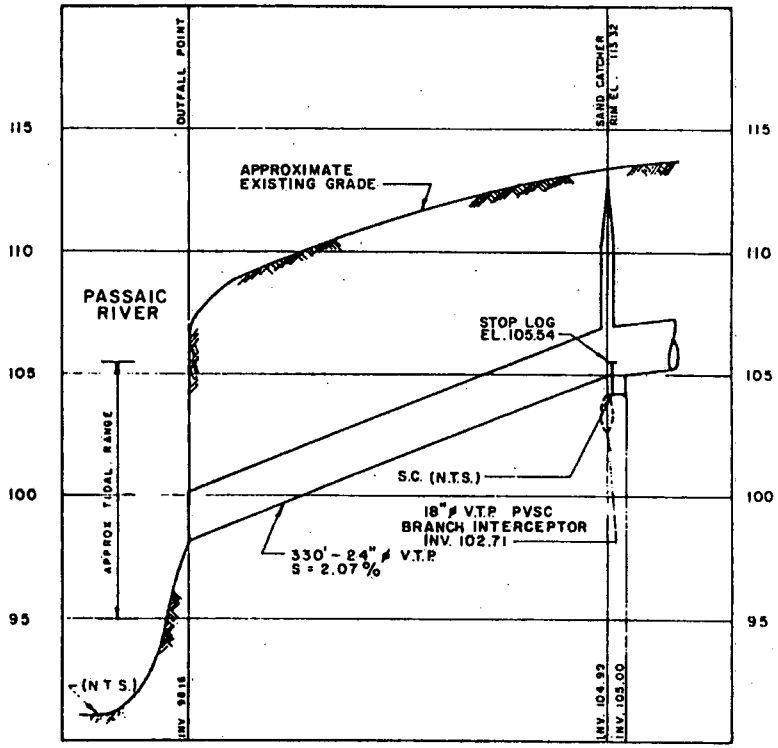
NOTE
ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

LEGEND
→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



KEY MAP

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. No 1261 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER K-003

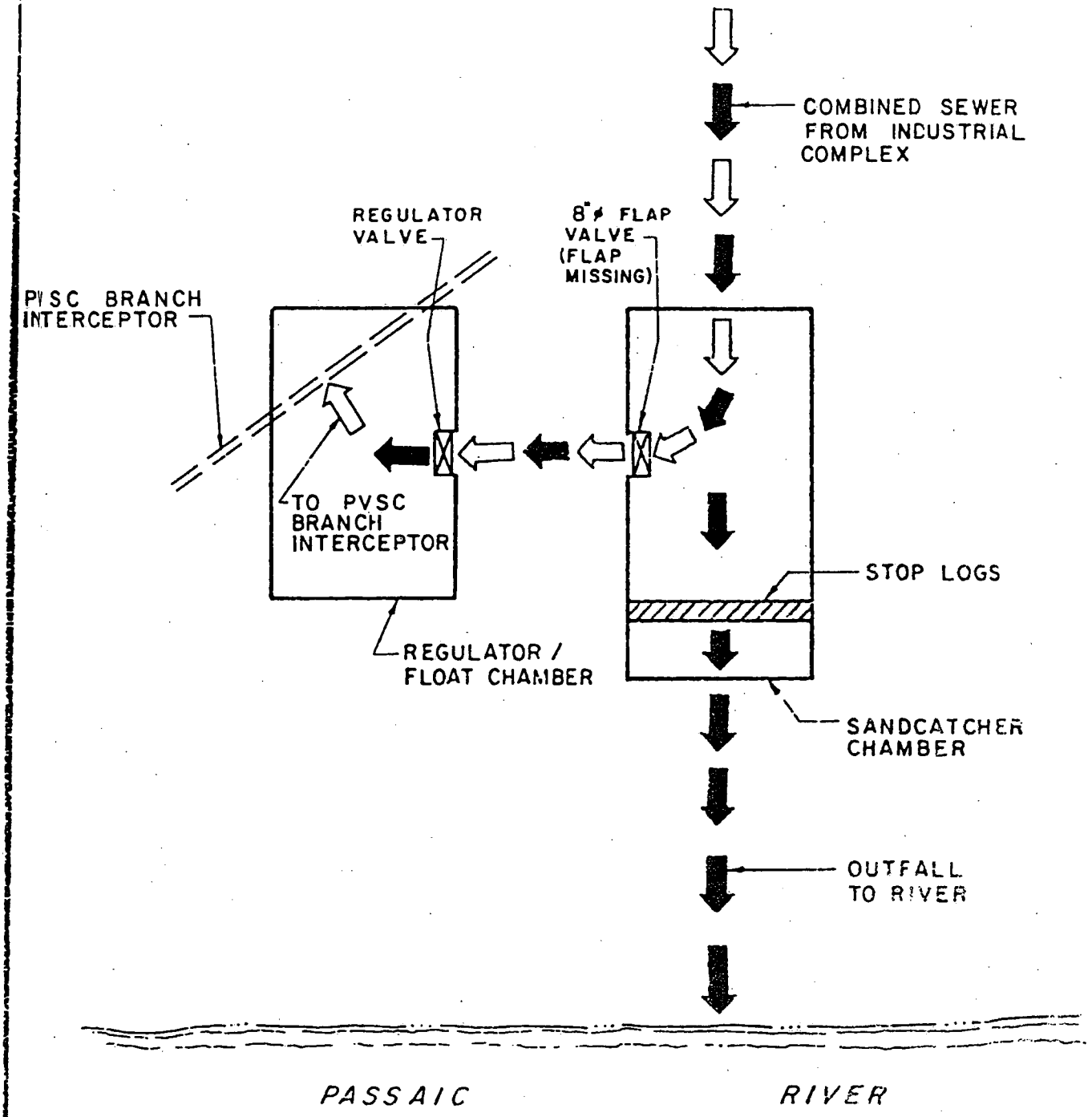
BERGEN AVENUE, KEARNY

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE 1

KLL001763



LEGEND

DRY WEATHER FLOW

STORM FLOW / OVERFLOW

KLL001764

PASSAIC VALLEY SEWERAGE COMMISSIONERS

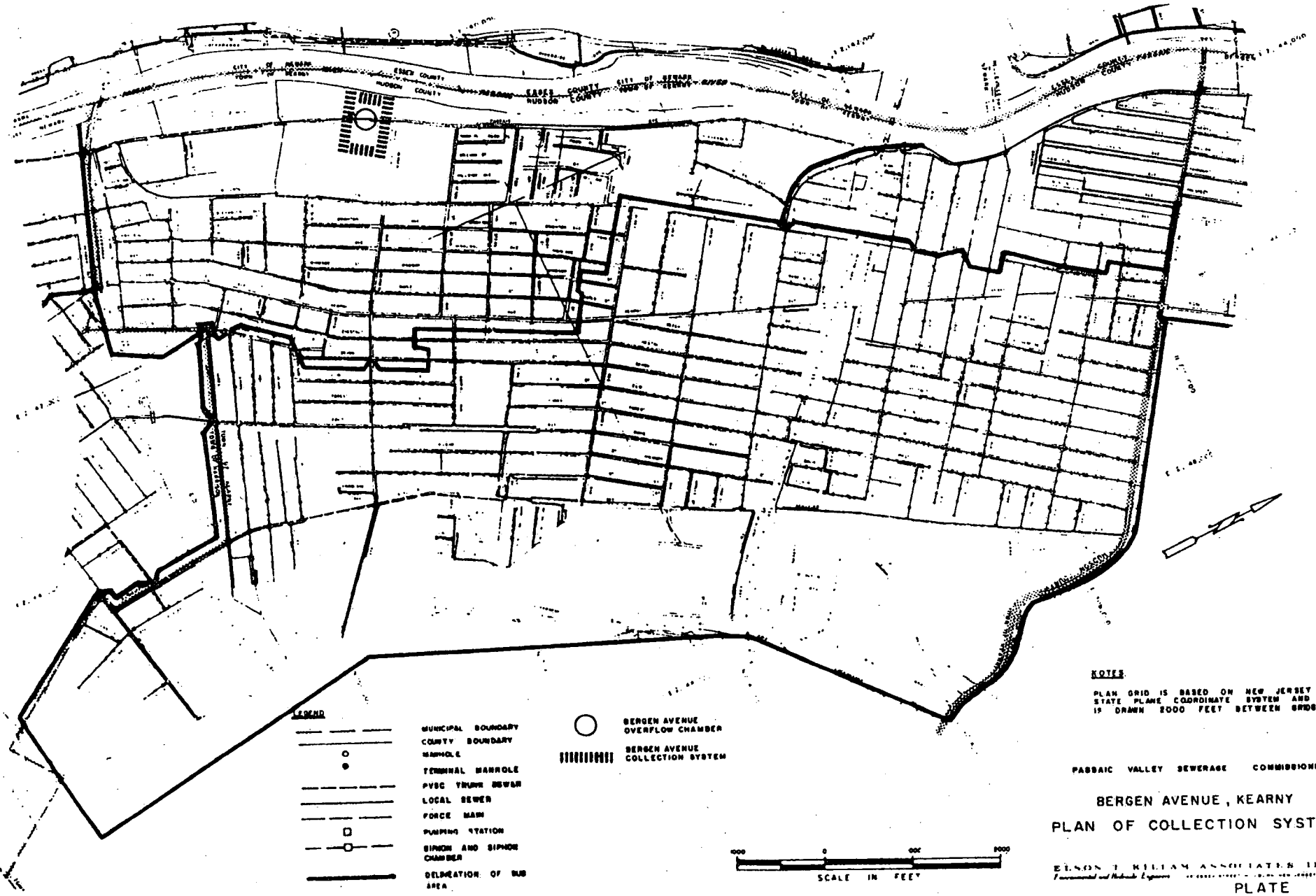
BERGEN AVENUE, KEARNY

SCHEMATIC

(019/K-003)

ELSON T. KILLAM ASSOCIATES, INC.

PLATE C



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

BERGEN AVENUE, KEARNY

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC

PLATE D

KLL001765

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

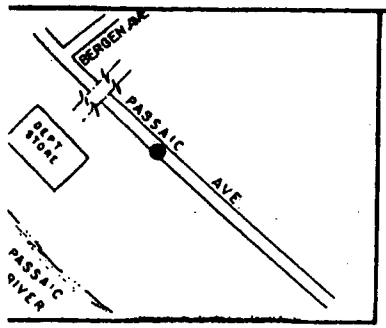
PASSAIC RIVER OVERFLOWS

NAIRN AVENUE, KEARNY
K-004

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001766



LOCATION PLAN

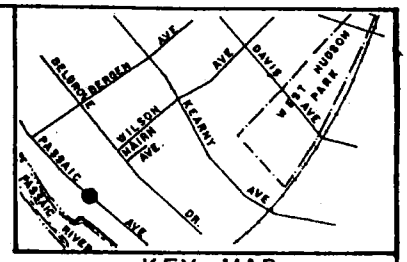
SCALE IN FEET

NOTE:

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

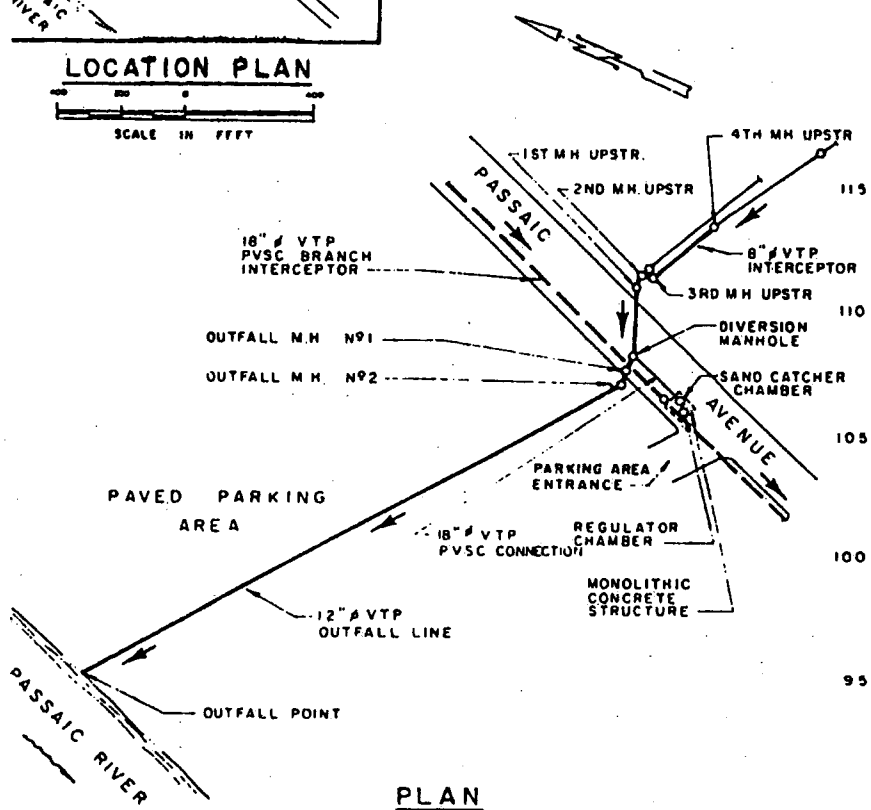
LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UPSTREAM
DN. STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



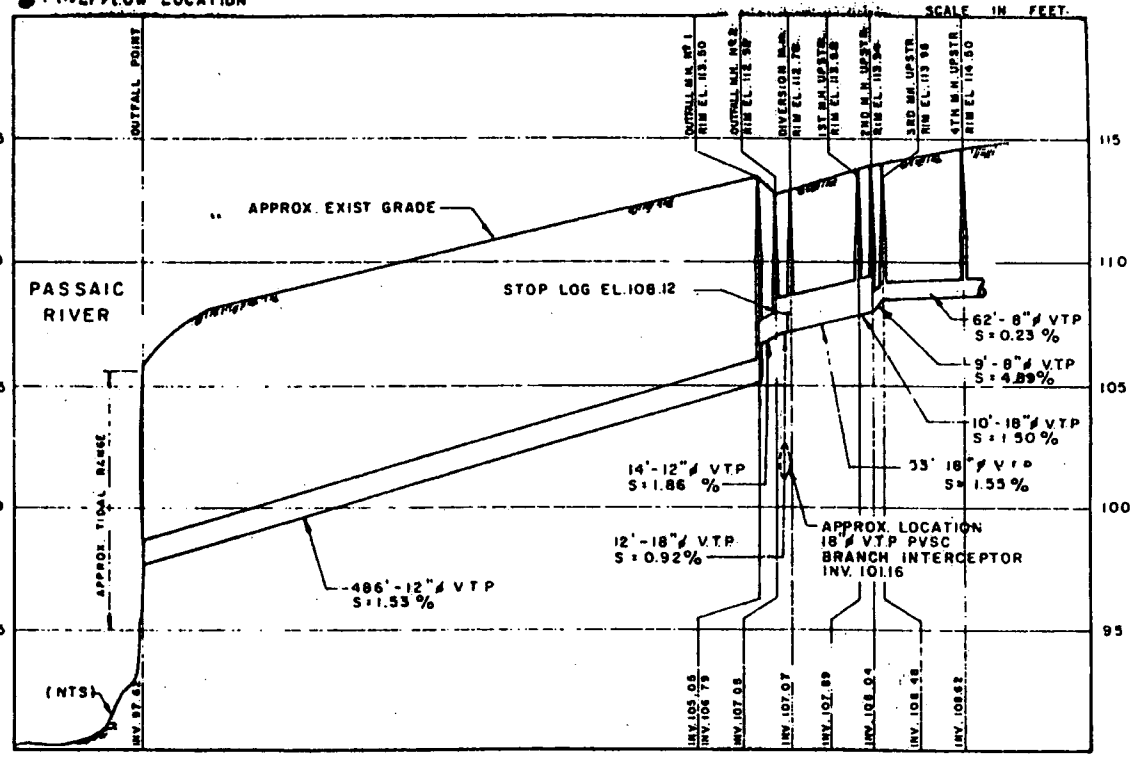
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. N° 1.. AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER K-004

NAIRN. AVENUE, KEARNY

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.

PLATE

KLL001767

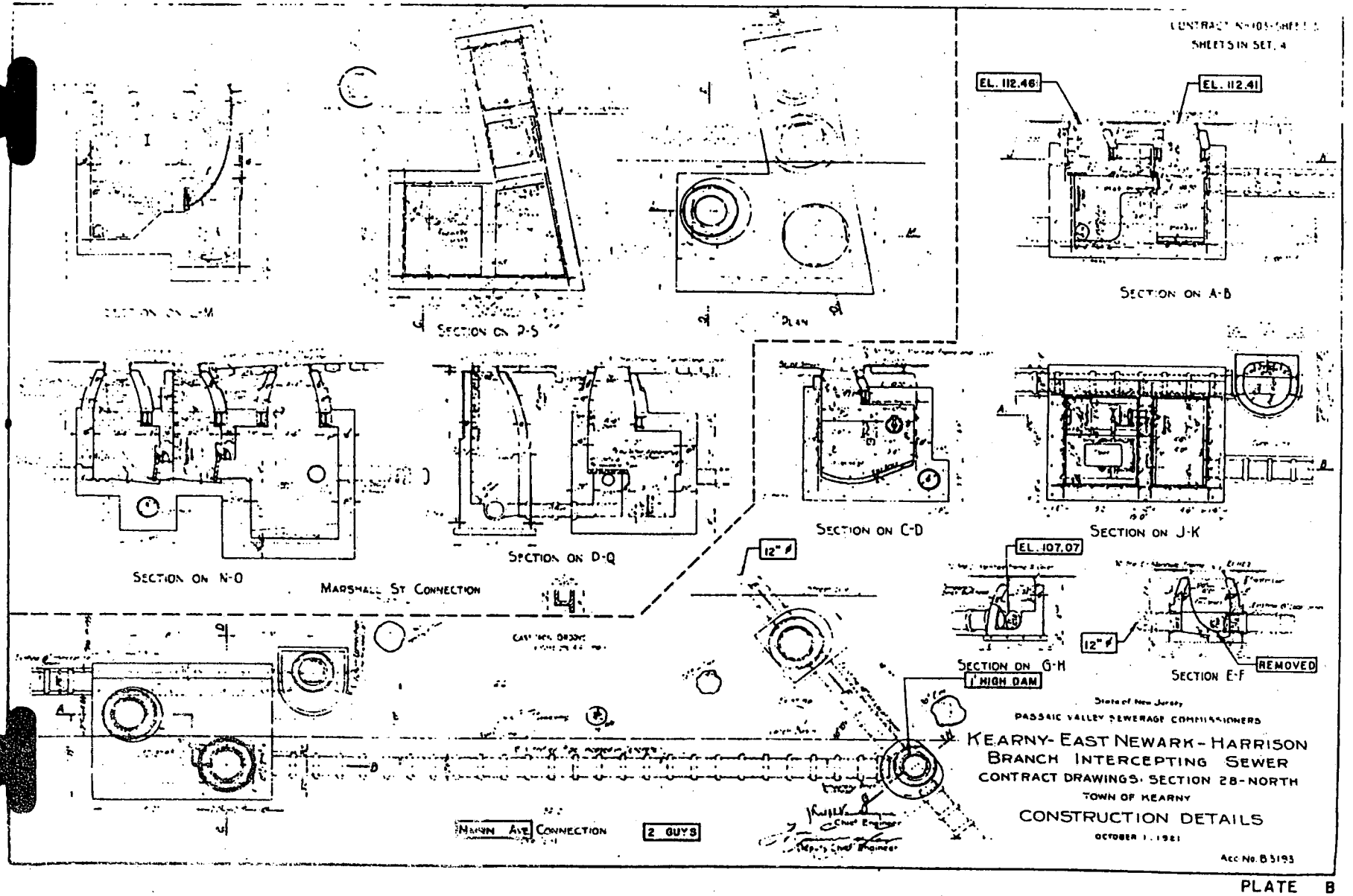
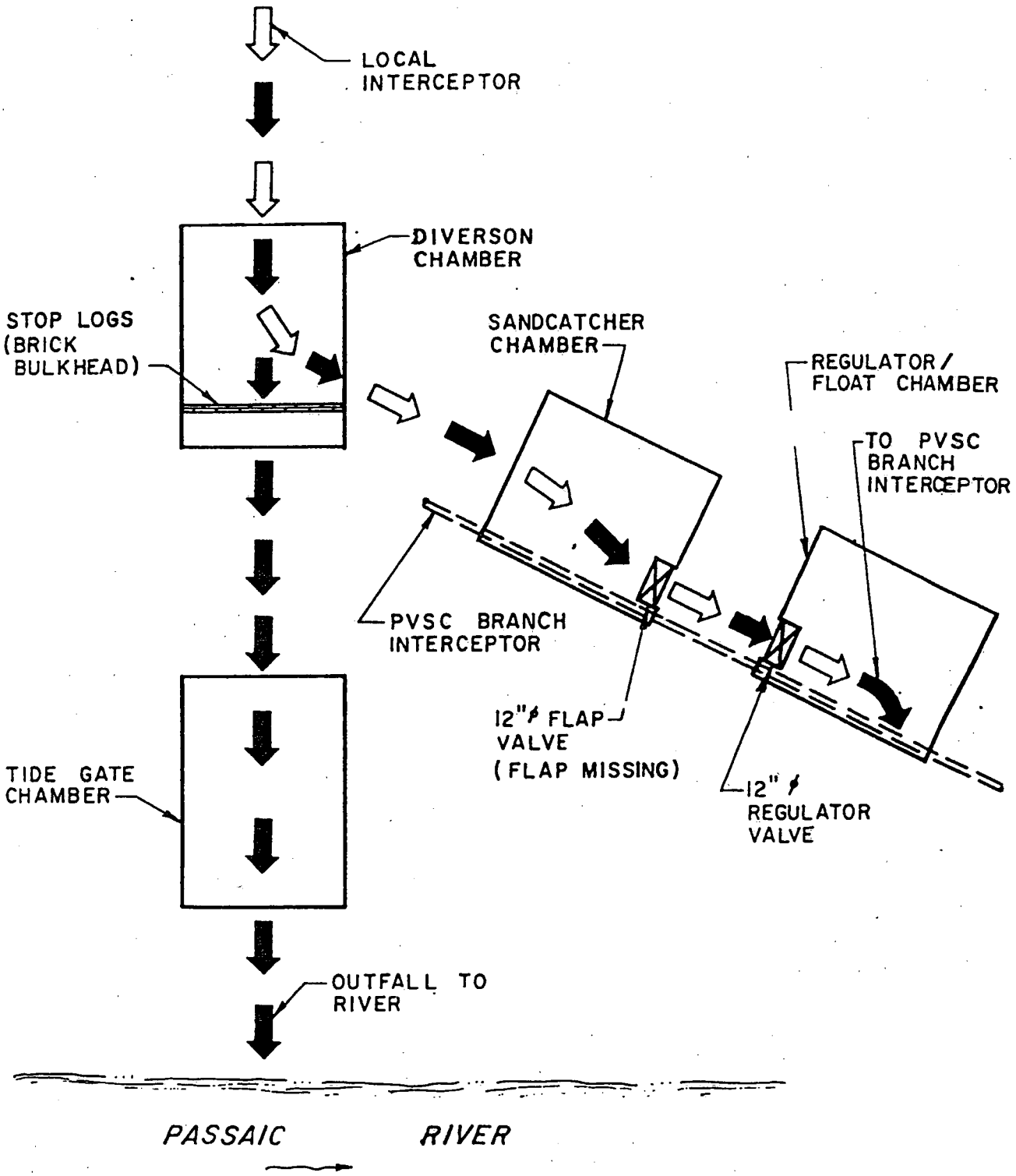


PLATE B

KLLC01700



LEGEND

DRY WEATHER FLOW

STORM FLOW / OVERFLOW

KLL001769

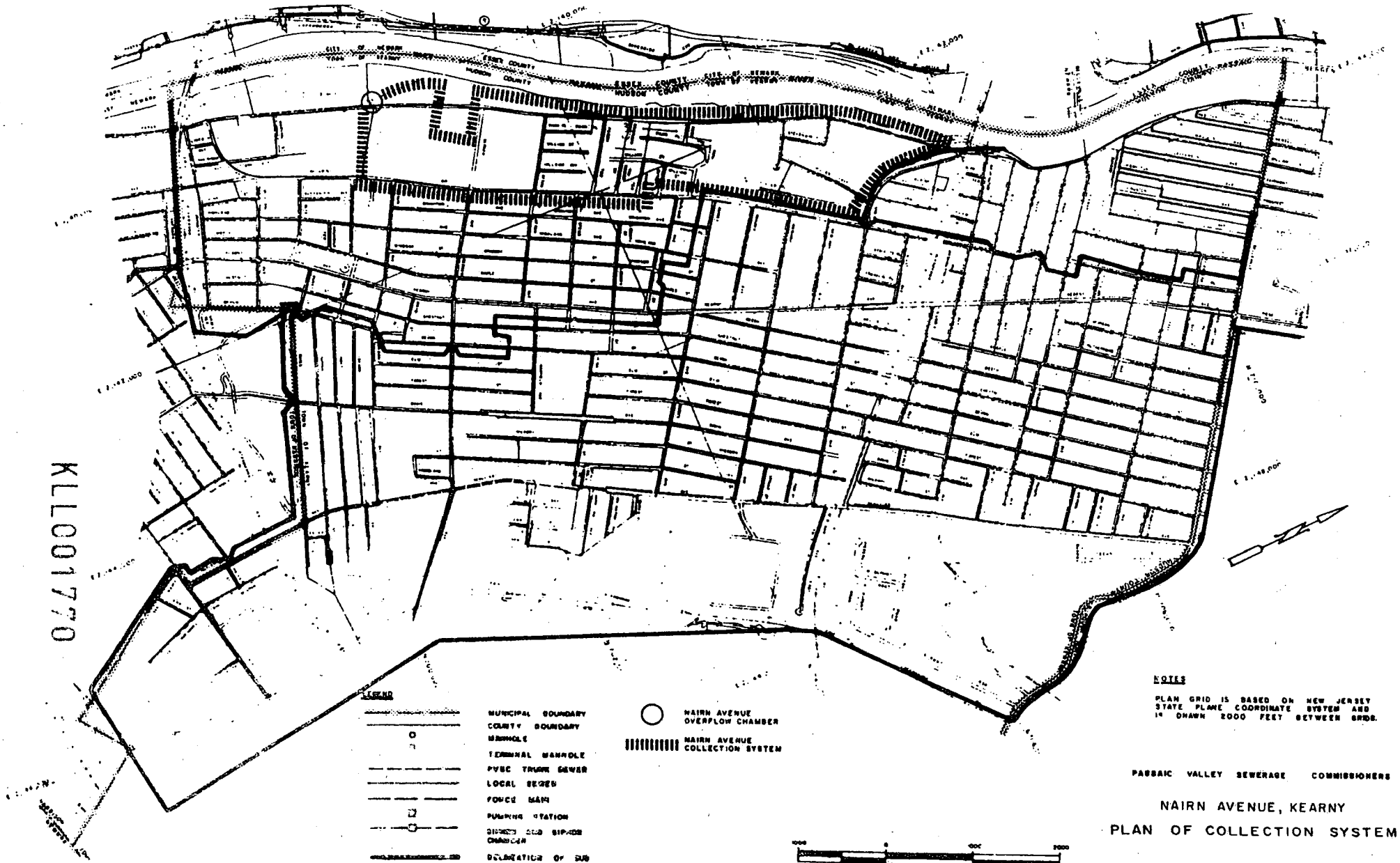
PASSAIC VALLEY SEWERAGE COMMISSIONERS

NAIRN AVENUE, KEARNY

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE C



PASSAIC VALLEY SEWERAGE COMMISSIONERS

NAIRN AVENUE, KEARNY

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE D

KLL001770

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

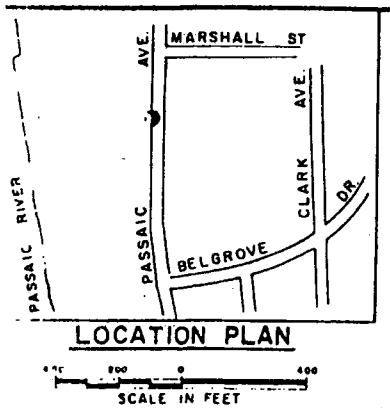
PASSAIC RIVER OVERFLOWS

MARSHALL STREET, KEARNY
K-005

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 40 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001771

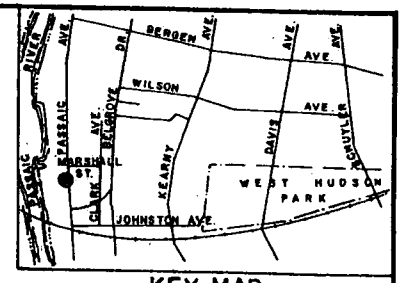


LOCATION PLAN

SCALE IN FEET

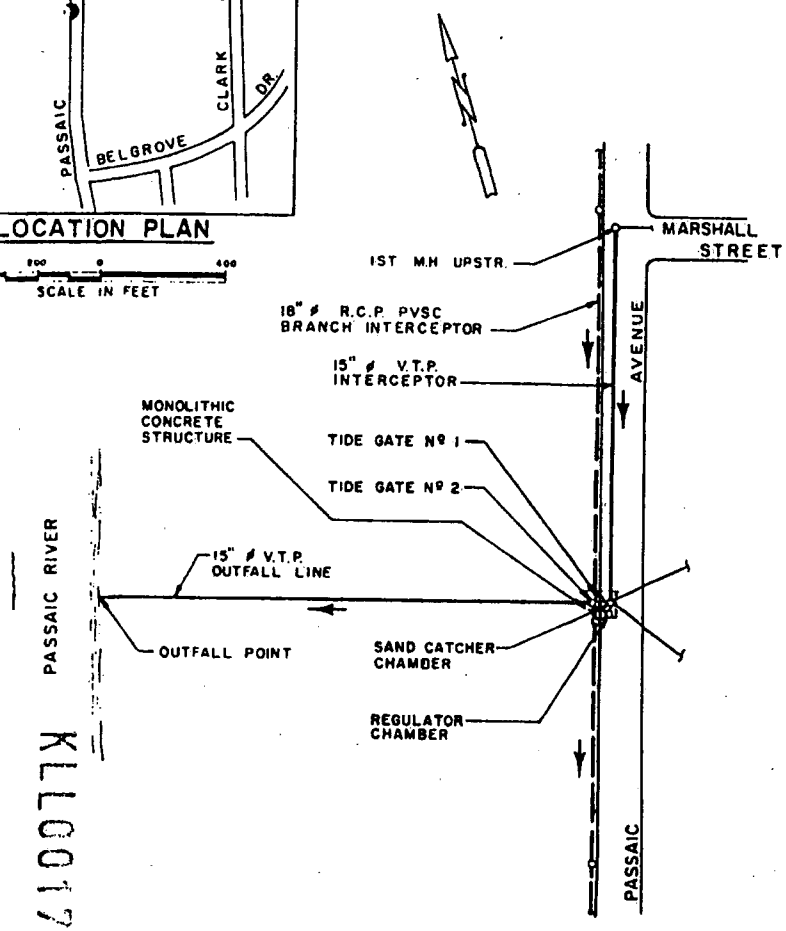
NOTE
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

LEGEND
→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UPSTREAM
DN. STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
R.C.P. = REINFORCED CONCRETE PIPE
● = OVERFLOW LOCATION



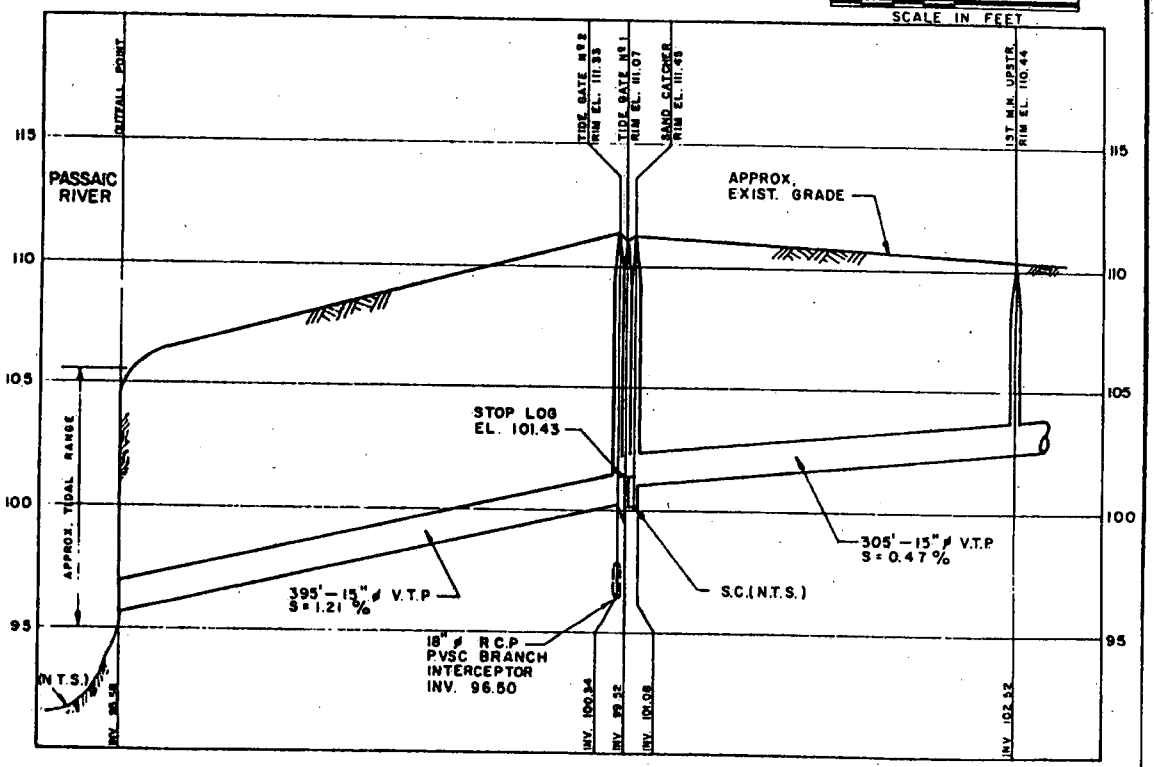
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ELEVATIONS BASED ON MENE 12A1 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY LOCATION AND DESCRIPTION AT APPENDIX

PASSAIC VALLEY SEWERAGE COMMISSIONERS
OVERFLOW CHAMBER K-005
MARSHALL STREET, KEARNY
PLAN AND PROFILE
ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

KLL001772

PLATE A

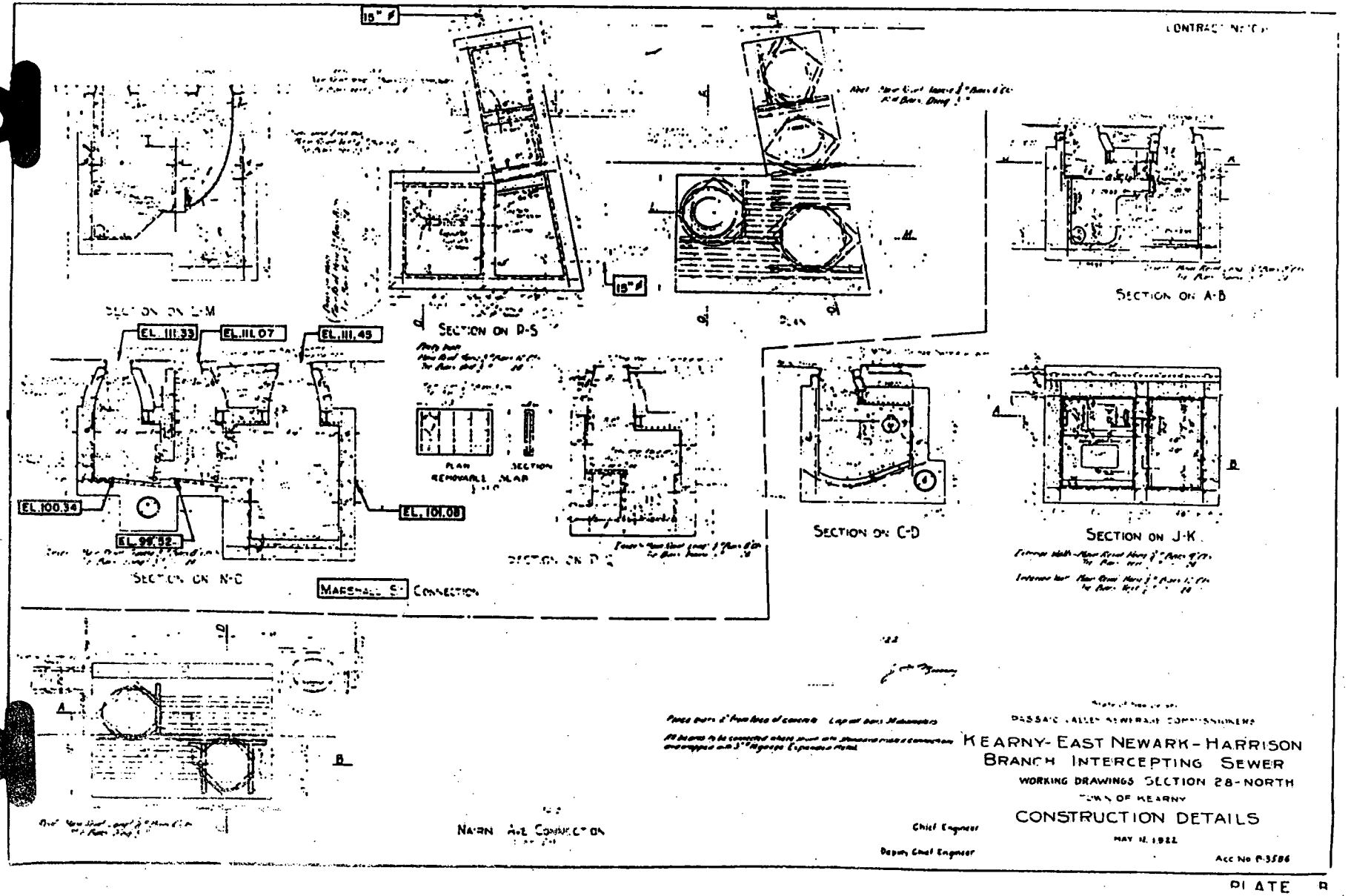
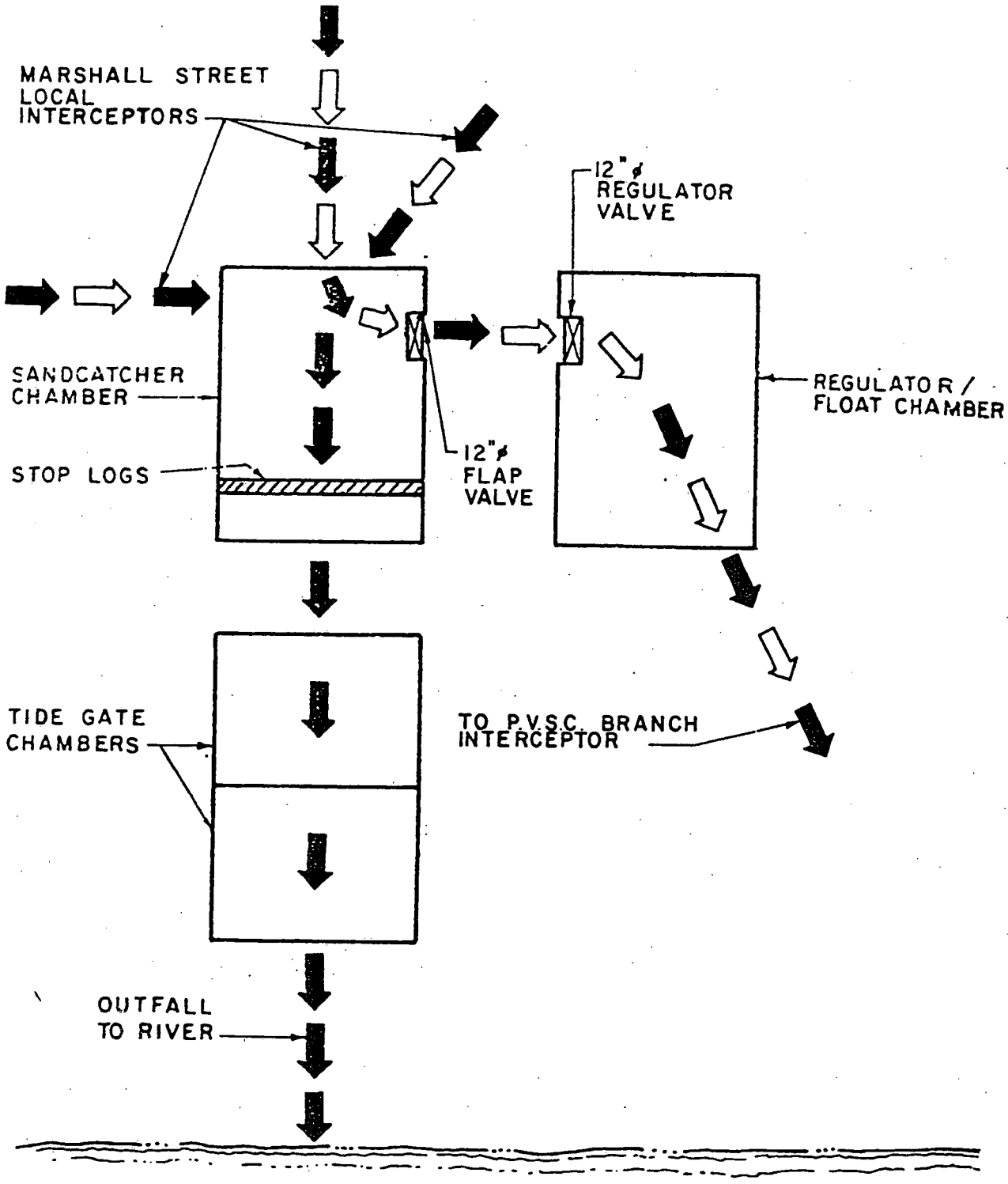


PLATE B

KLL001773



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001774

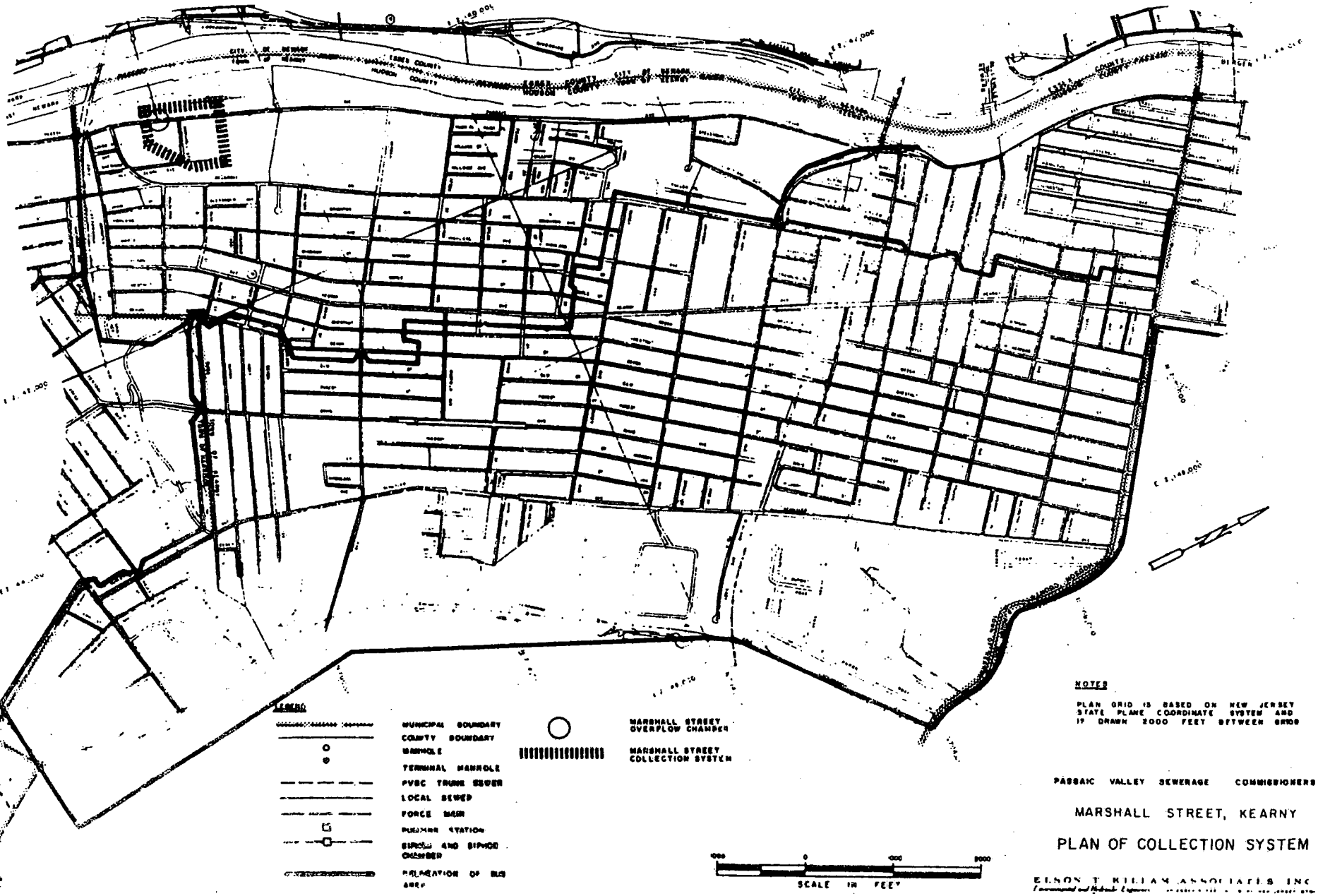
PASSAIC VALLEY SEWERAGE COMMISSIONERS

MARSHALL STREET, KEARNY

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC.

PLATE C



PASSAIC VALLEY SEWERAGE COMMISSIONERS

MARSHALL STREET, KEARNY

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE I

KLL001775

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC RIVER OVERFLOWS

JOHNSTON AVENUE, KEARNY
K-006

1976

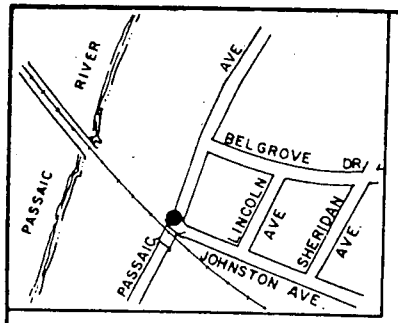
ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLLC01776

NOTE
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

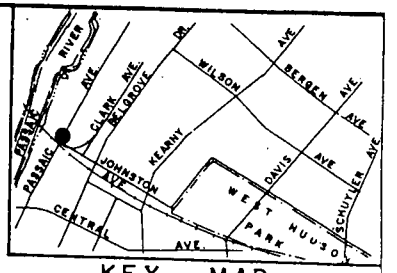
LEGEND:

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
N.T.S. = NOT TO SCALE
R.C.P. = REINFORCED CONCRETE PIPE
● = OVERFLOW LOCATION



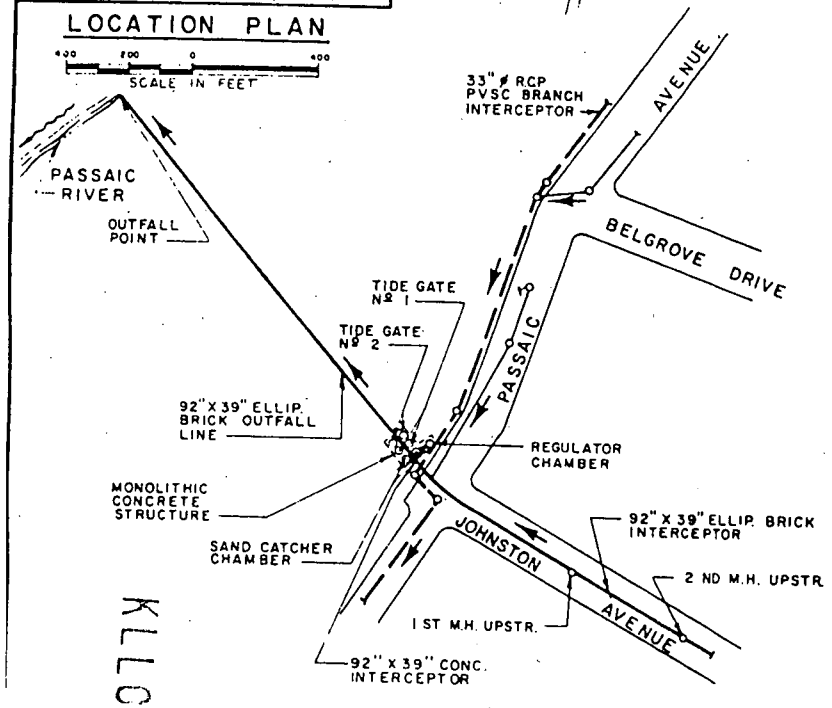
LOCATION PLAN

400 200 0 400
SCALE IN FEET



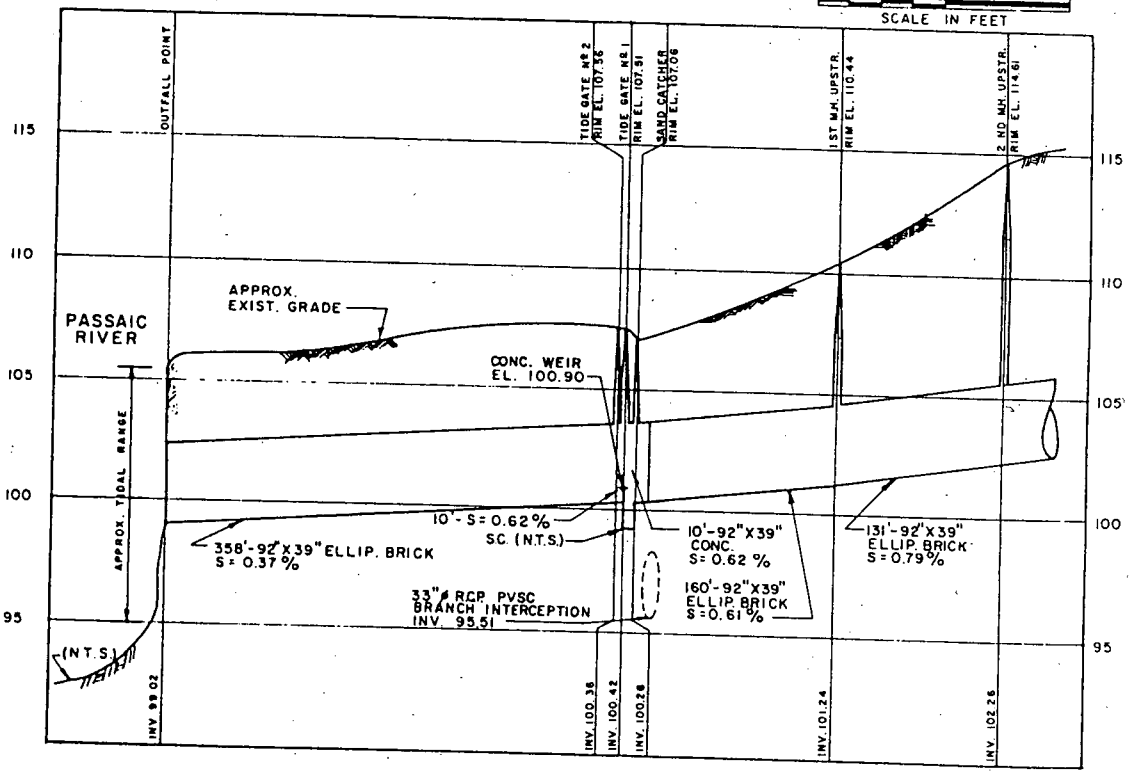
KEY MAP

2000 1000 0 2000
SCALE IN FEET



PLAN

100 50 0 100
SCALE IN FEET



PROFILE

100 50 0 100
HORIZ. SCALE IN FEET

5 0 5
VERT SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. Nº 1764 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX

PASSAIC VALLEY SEWERAGE COMMISSIONERS
OVERFLOW CHAMBER K-006
JOHNSTON AVENUE, KEARNY
PLAN AND PROFILE
ELSON T. KILLAM ASSOCIATES INC.
Environmental and Hydraulic Engineers

KL00177

PLATE A

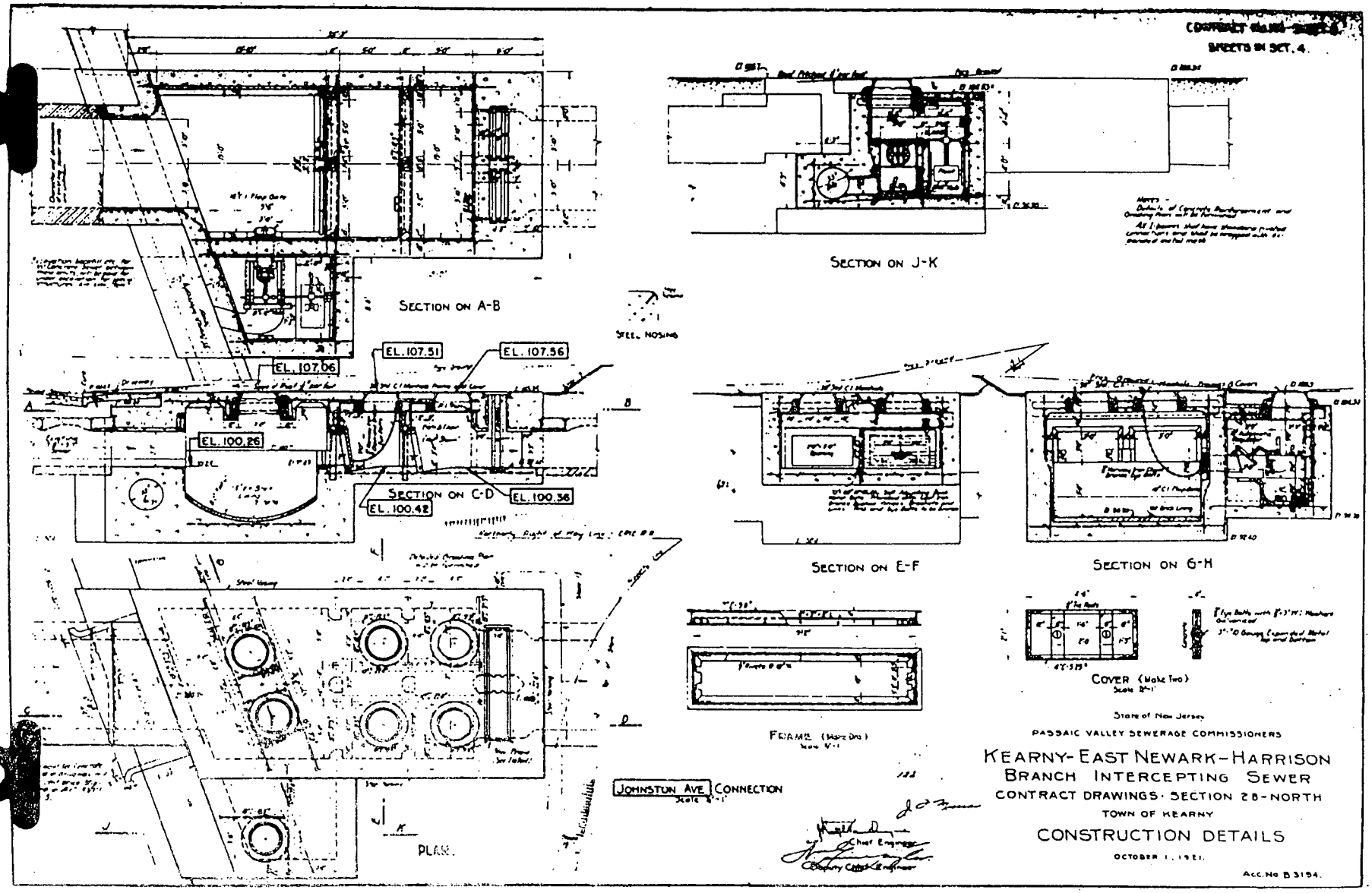
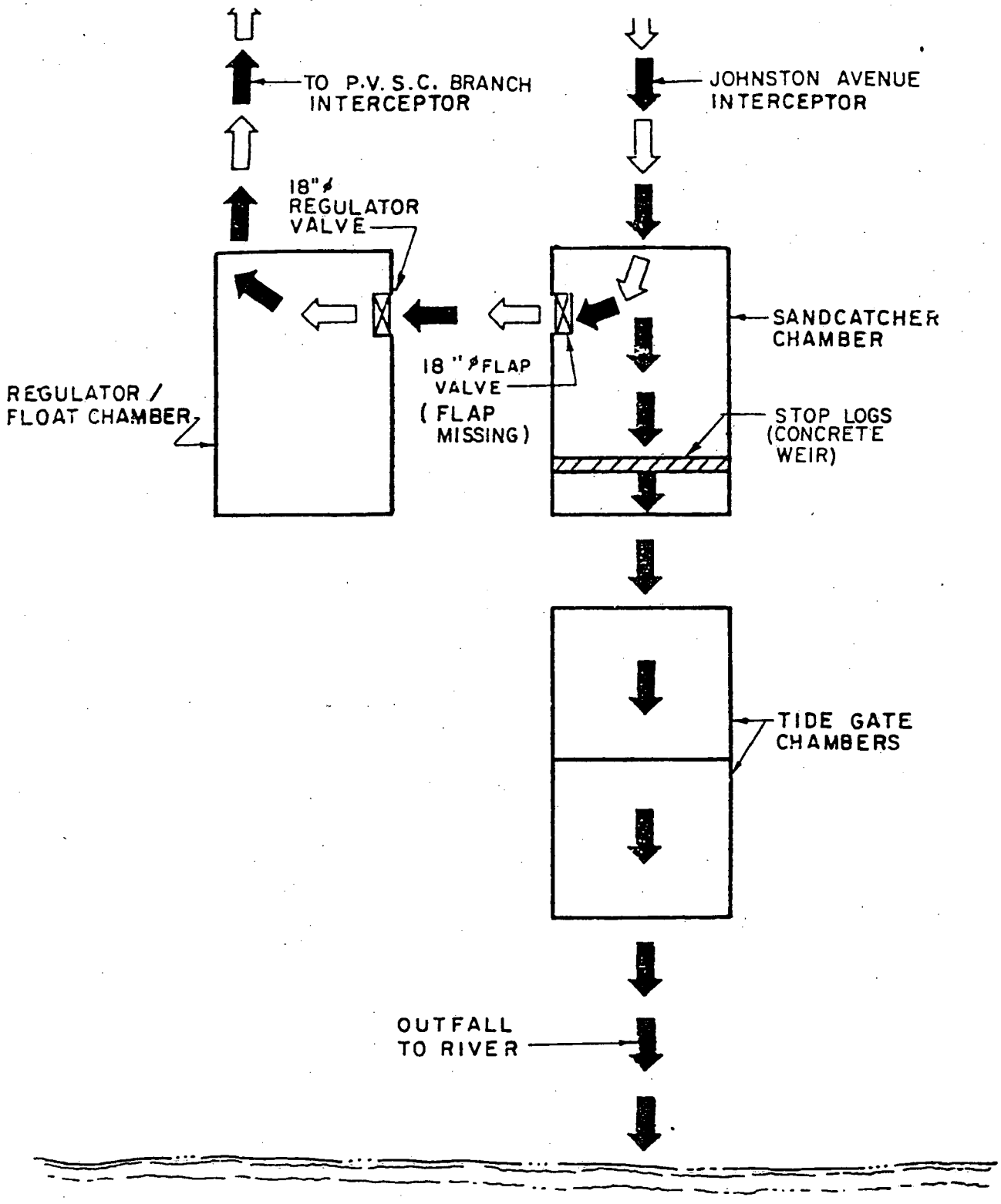


PLATE B

KLL001778



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001779

PASSAIC VALLEY SEWERAGE COMMISSIONERS

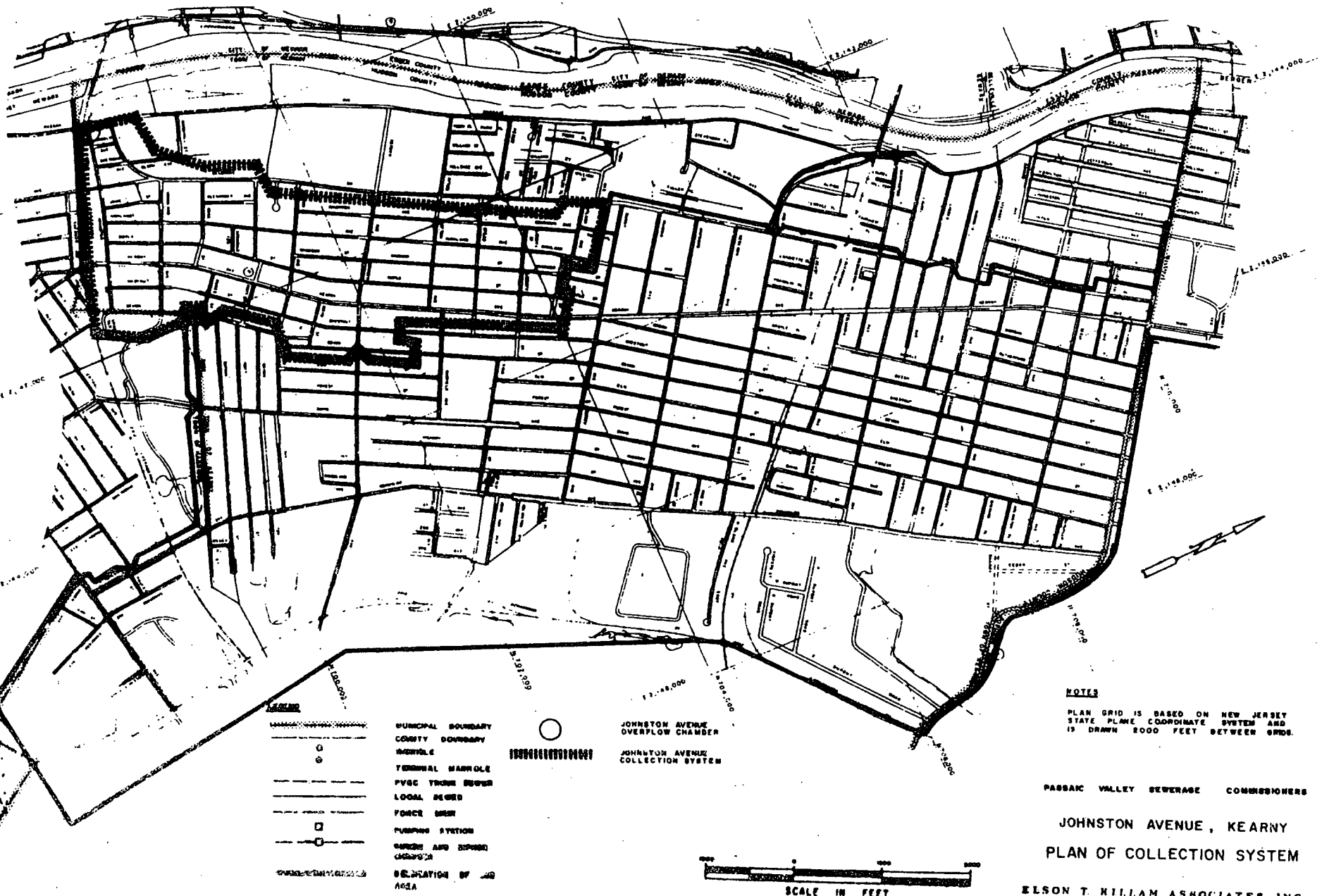
JOHNSTON AVENUE, KEARNY

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE C



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

JOHNSTON AVENUE, KEARNY

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC

Environmental and Hydraulic Engineers

PLATE D

KLL001760

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC RIVER OVERFLOWS

IVY STREET, KEARNY
K-007

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001781

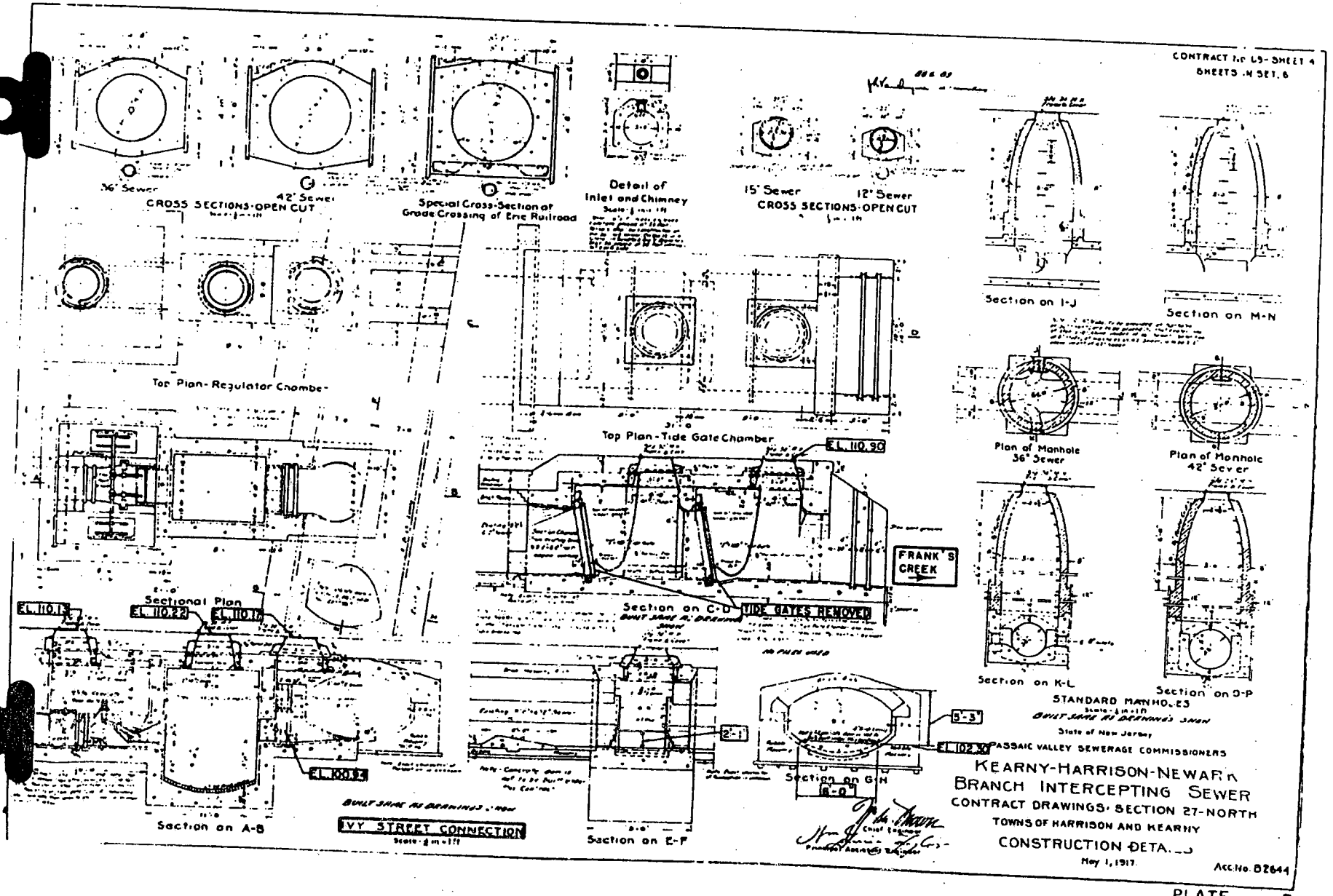
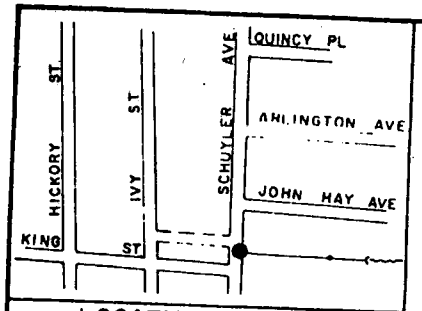


PLATE 8

(3)

L001782



LOCATION PLAN

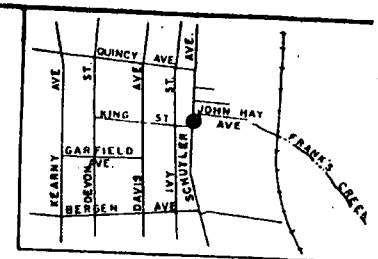
SCALE IN FEET

LEGEND

- → DIRECTION OF FLOW
- S.C. = SAND CATCHER
- T.G. = TIDE GATE
- UP STR. = UPSTREAM
- DN. STR. = DOWNSTREAM
- N.T.S = NOT TO SCALE
- ● = OVERFLOW LOCATION

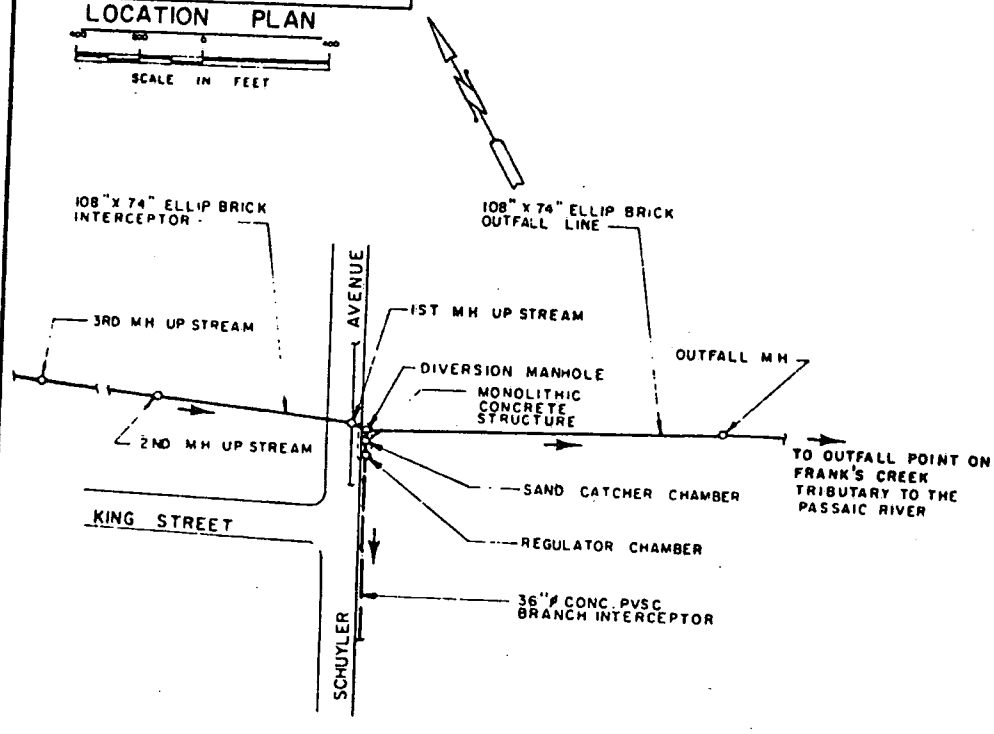
NOTES

1. ALL SIDE PIPE LINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.
2. TIDE GATE CHAMBERS ARE LOCATED ADJACENT TO OUTFALL AT FRANK'S CREEK.



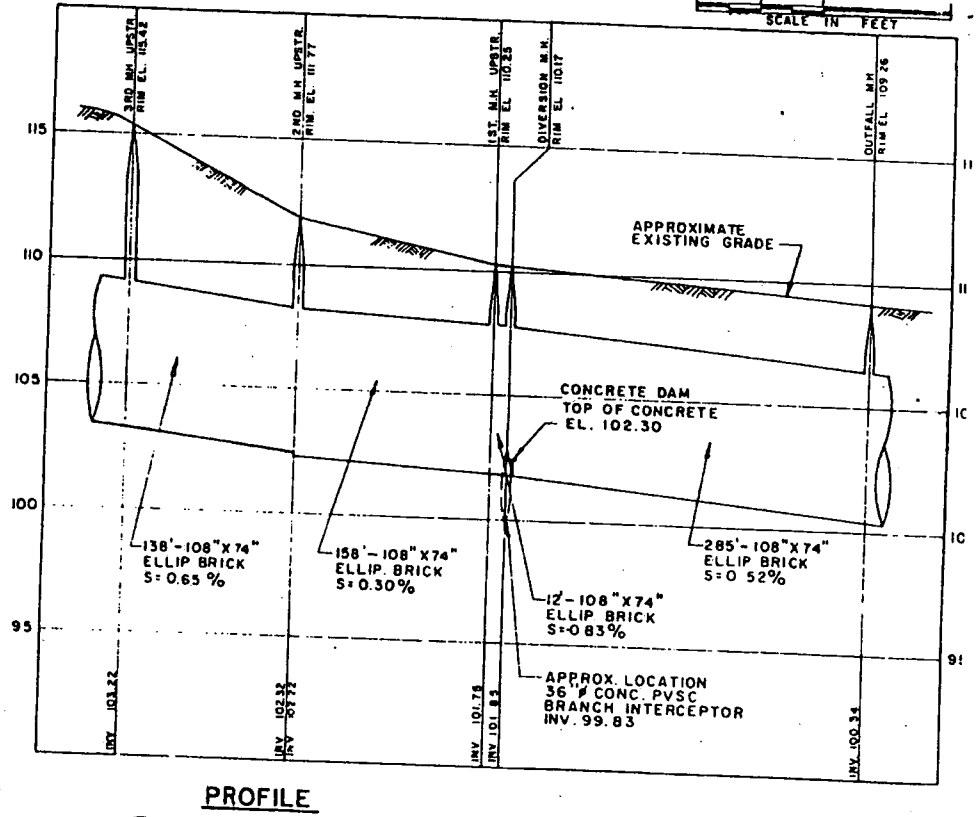
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. No 1891 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONER

OVERFLOW CHAMBER K-007

IVY STREET, KEARNY

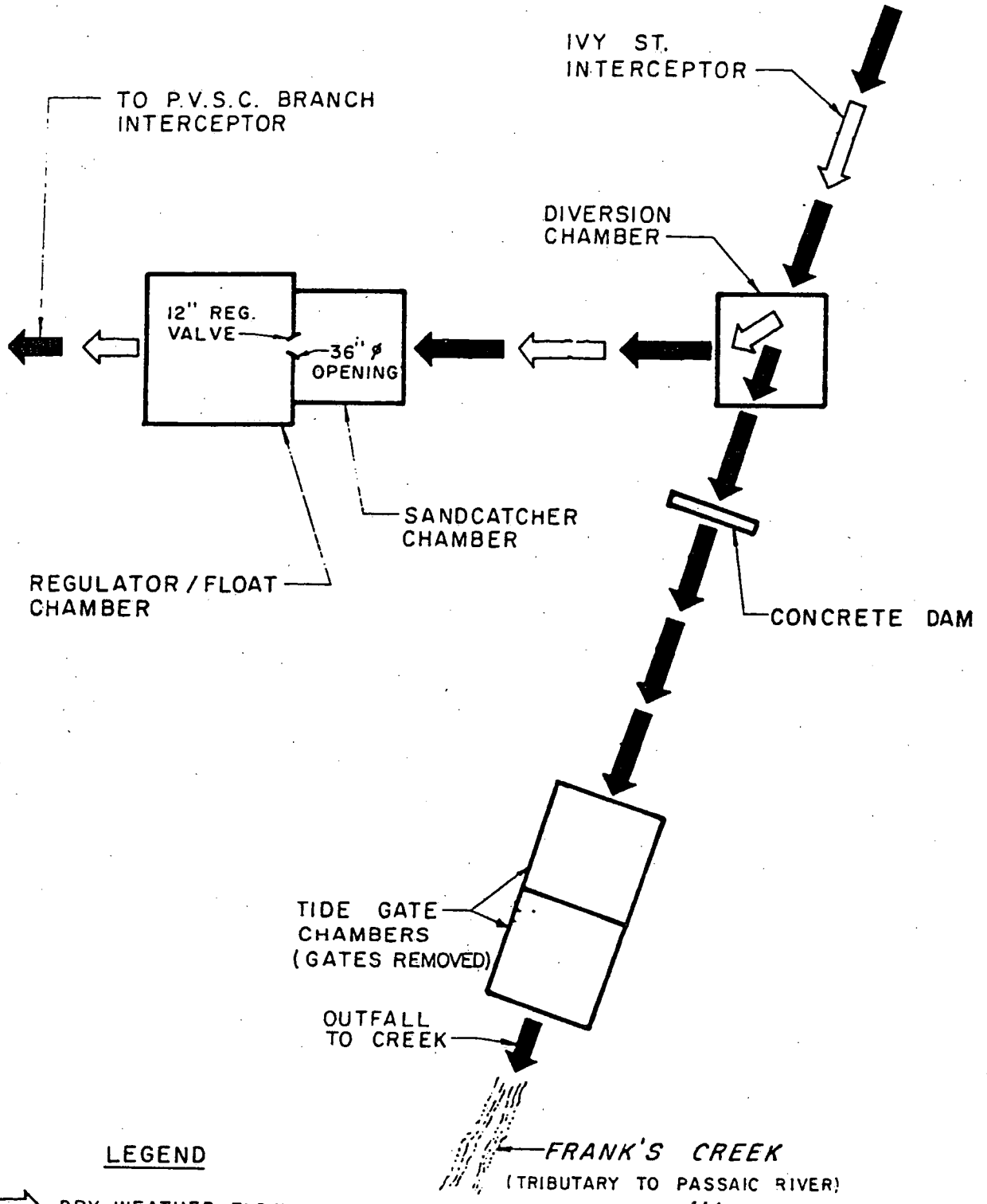
PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE

(2)



LEGEND

DRY WEATHER FLOW

STORM FLOW/ OVERFLOW

KLLC01783

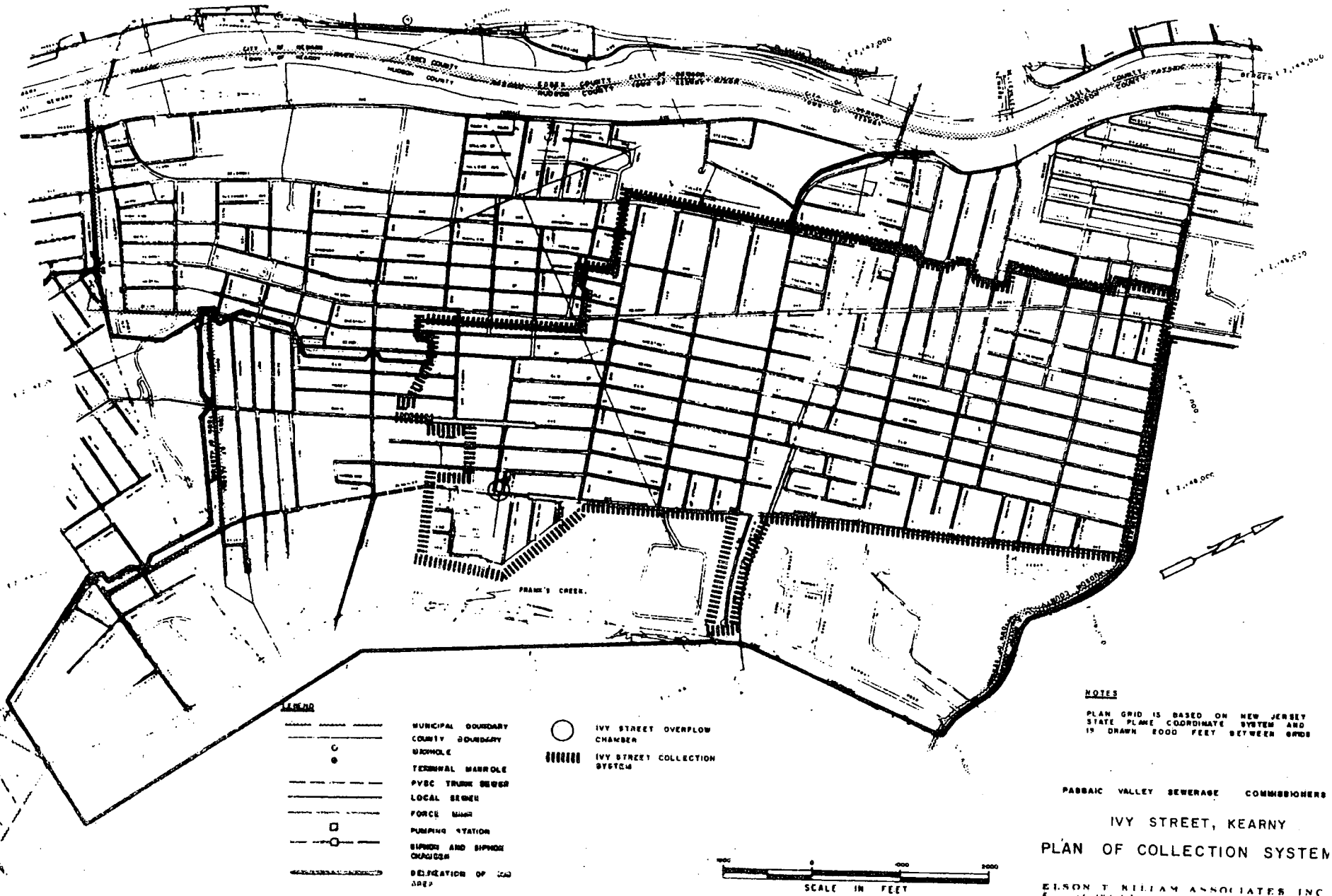
PASSAIC VALLEY SEWERAGE COMMISSIONERS

IVY STREET, KEARNY

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE C



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS

PASSAIC VALLEY SEWERAGE COMMISSIONERS

IVY STREET, KEARNY

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

PLATE D

KLL001764

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

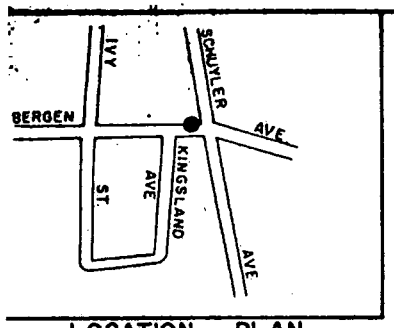
PASSAIC RIVER OVERFLOWS

BERGEN AVENUE, KEARNY
K-008

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers
40 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001785



LOCATION PLAN

400 200 0 400

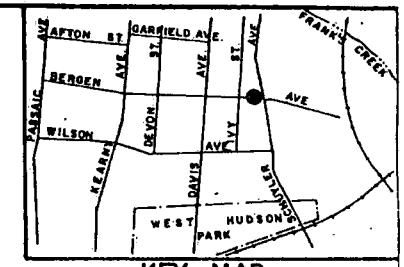
SCALE IN FEET

NOTE

ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

LEGEND

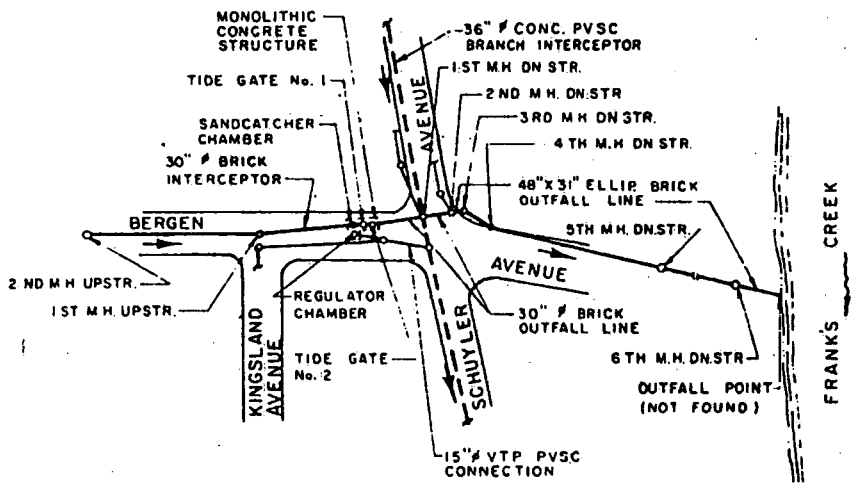
→ DIRECTION OF FLOW
S.C. = SAND CATCHER
UP STR. = UPSTREAM
DN. STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
V. T. P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



KEY MAP

2000 1000 0 2000

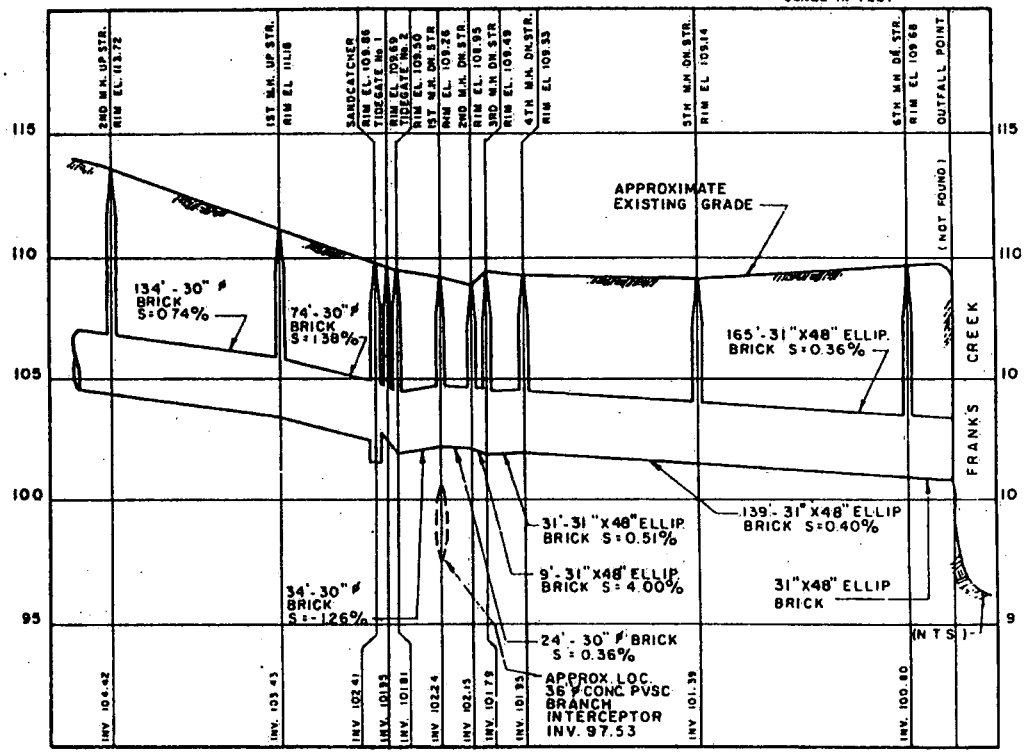
SCALE IN FEET



PLAN

100 50 0 100

SCALE IN FEET



PROFILE

HORIZONTAL 100 50 0 100 SCALE IN FEET

VERTICAL 5 4 3 2 1 0 5 SCALE IN FEET

KLL001786

ALL ELEVATIONS BASED ON U.S.N. No. 1291 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER K-008

BERGEN AVENUE, KEARNY

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE

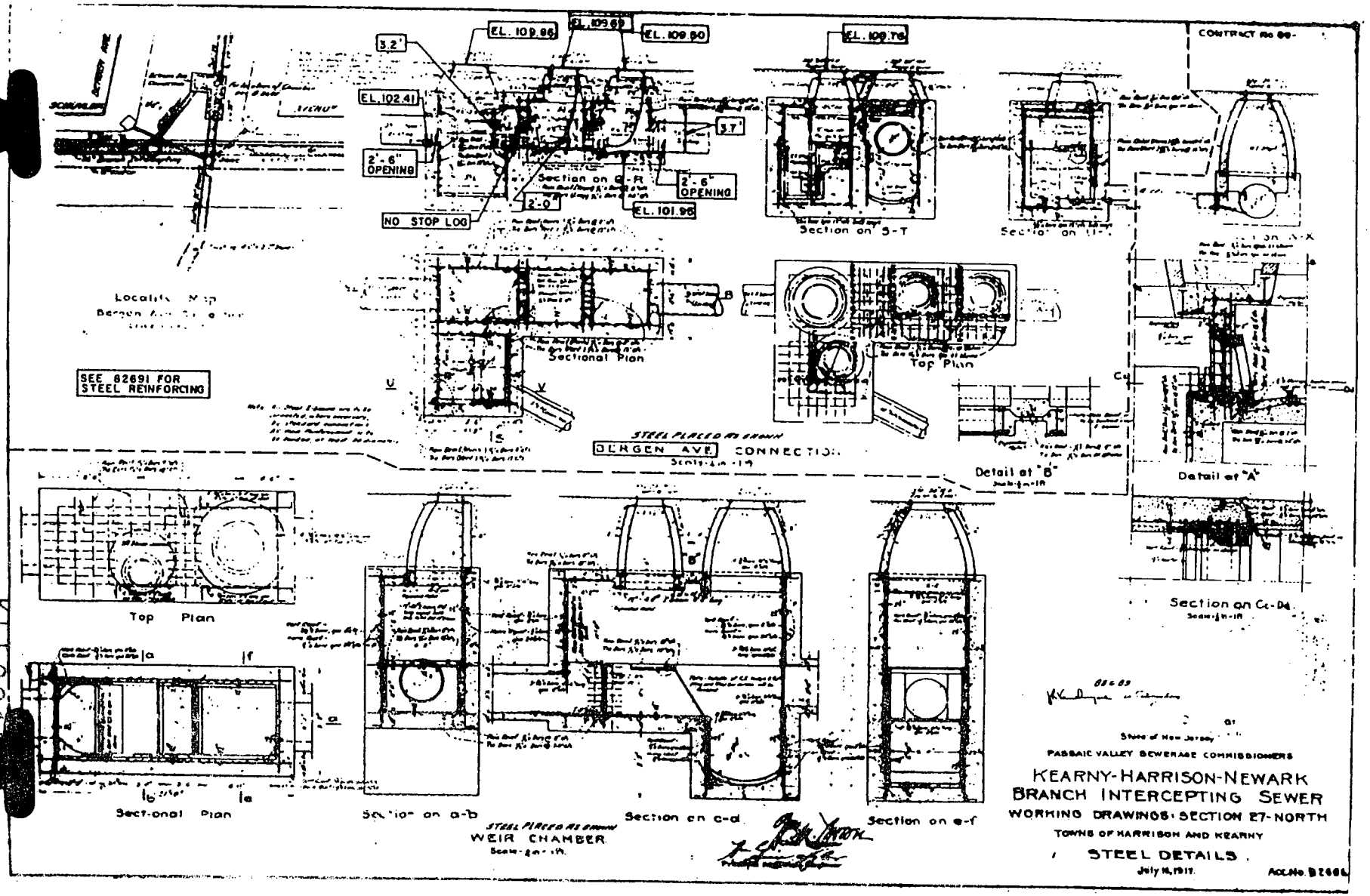
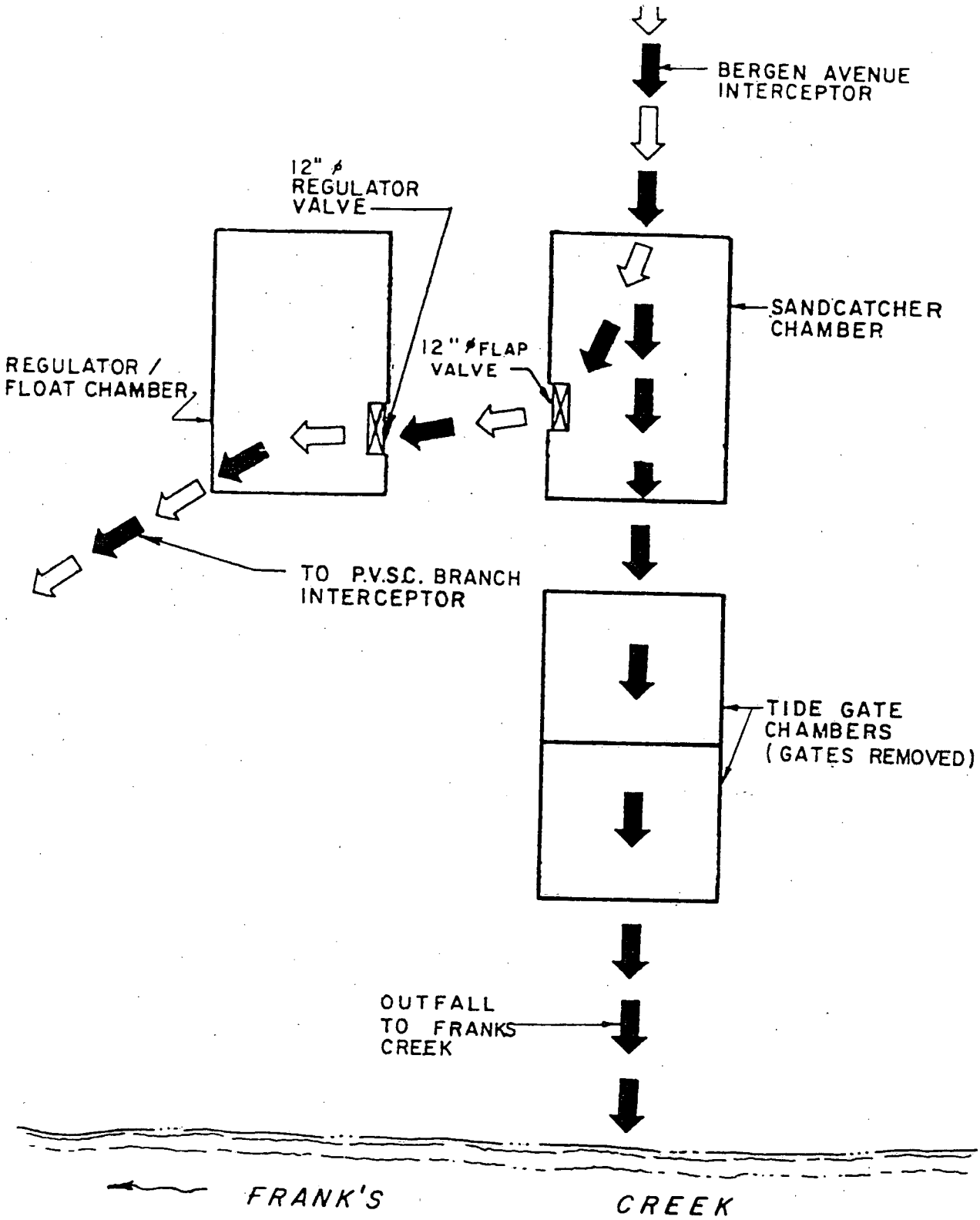


PLATE 8

KLL001



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001788

PASSAIC VALLEY SEWERAGE COMMISSIONERS

BERGEN AVENUE, KEARNY

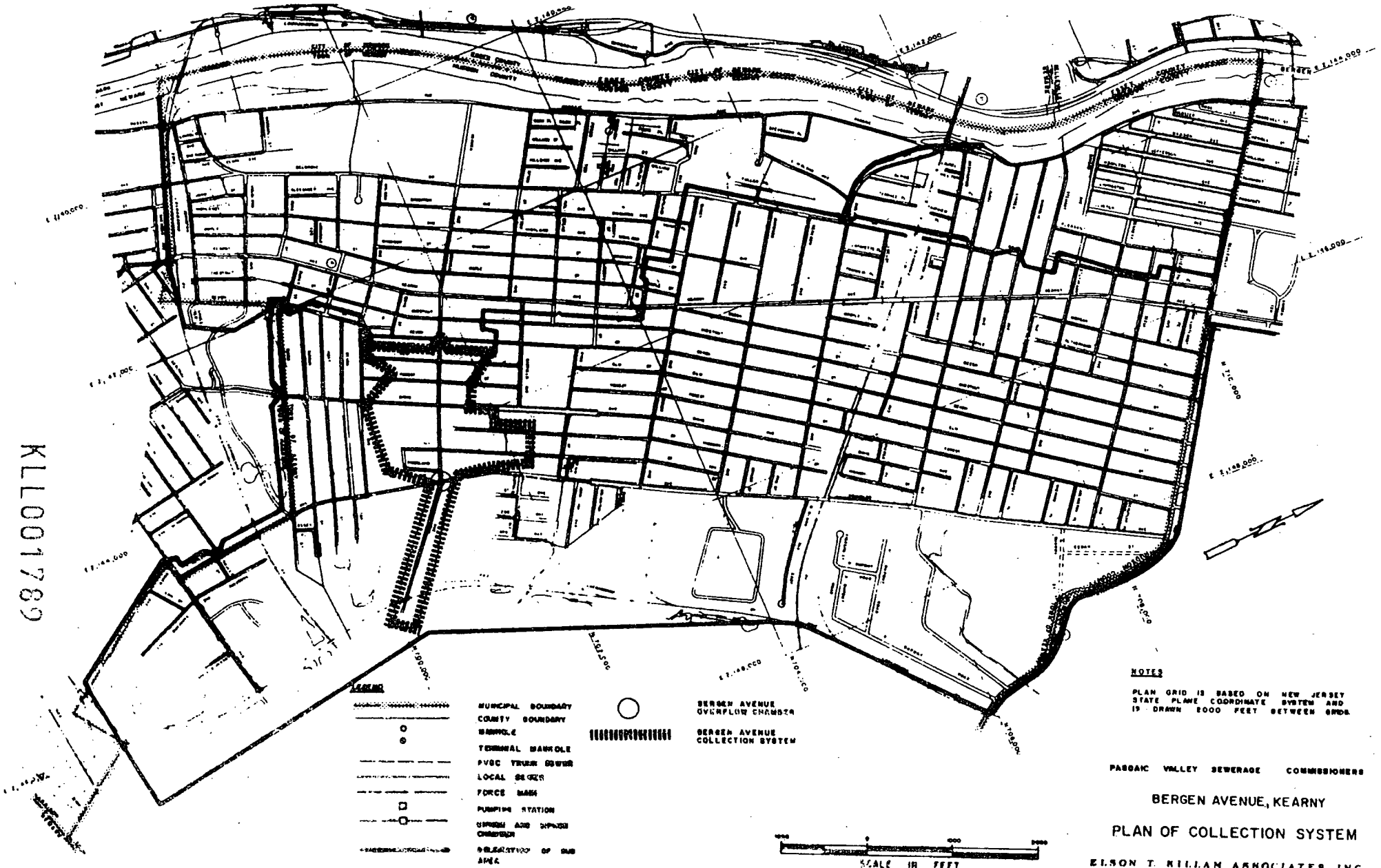
SCHEMATIC

(024/K-008)

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE C



PASSAIC VALLEY SEWERAGE COMMISSIONERS

BERGEN AVENUE, KEARNY

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

PLATE D

KLL001789

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

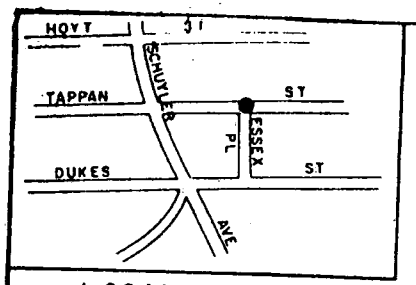
PASSAIC RIVER OVERFLOWS

TAPPAN STREET, KEARNY
K-009

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers
48 ESSEX STREET MALLOURN NEW JERSEY 07041

KLL001790



LOCATION PLAN

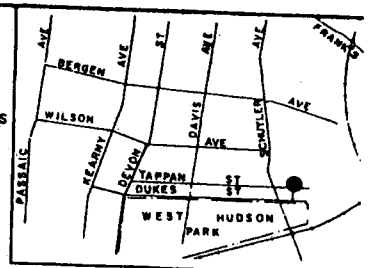
SCALE IN FEET

NOTES

1. ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.
2. THE TAPPAN AND DUKES STREET OUTFALLS JOIN INTO A COMMON OUTFALL PIPE WHICH EMPTIES INTO AN OPEN DITCH IN THE MEADOWLANDS ALONG THE ERIE - LACKAWANNA RAILROAD.

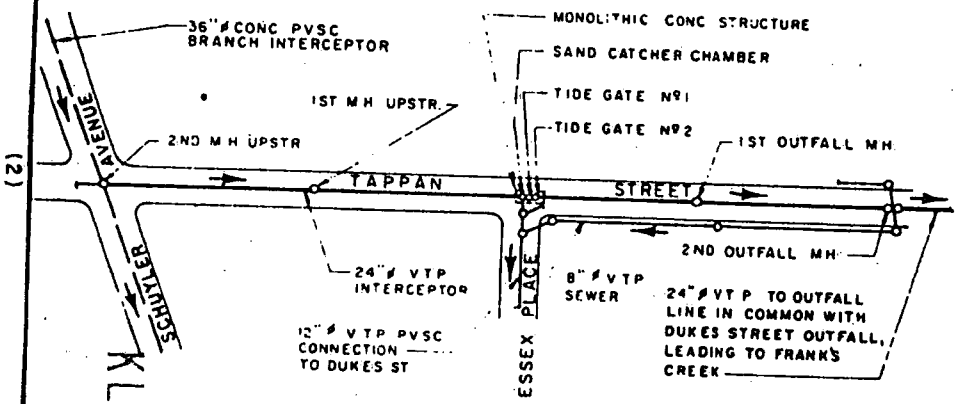
LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
V.T.P. = VITRIFIED TILE PIPE
UP STR. = UPSTREAM
DN. STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
● = OVERFLOW LOCATION



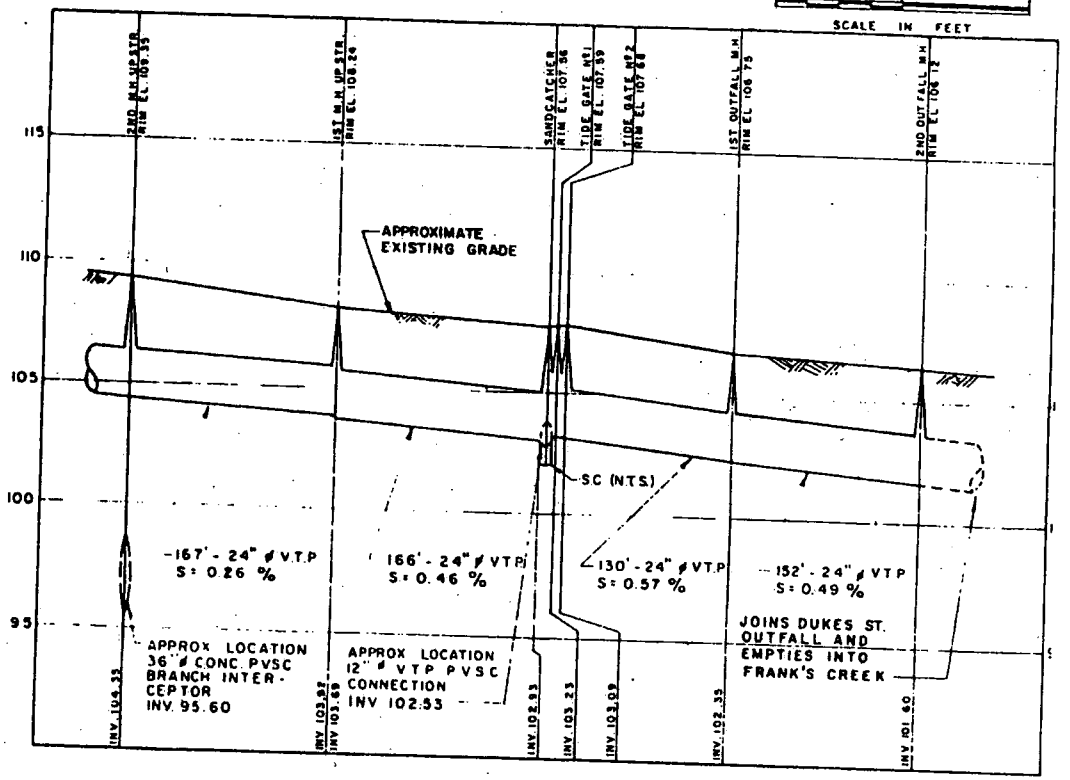
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. Nº 1891 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER K-009

TAPPAN STREET, KEARNY

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE

(2)

KLL001791

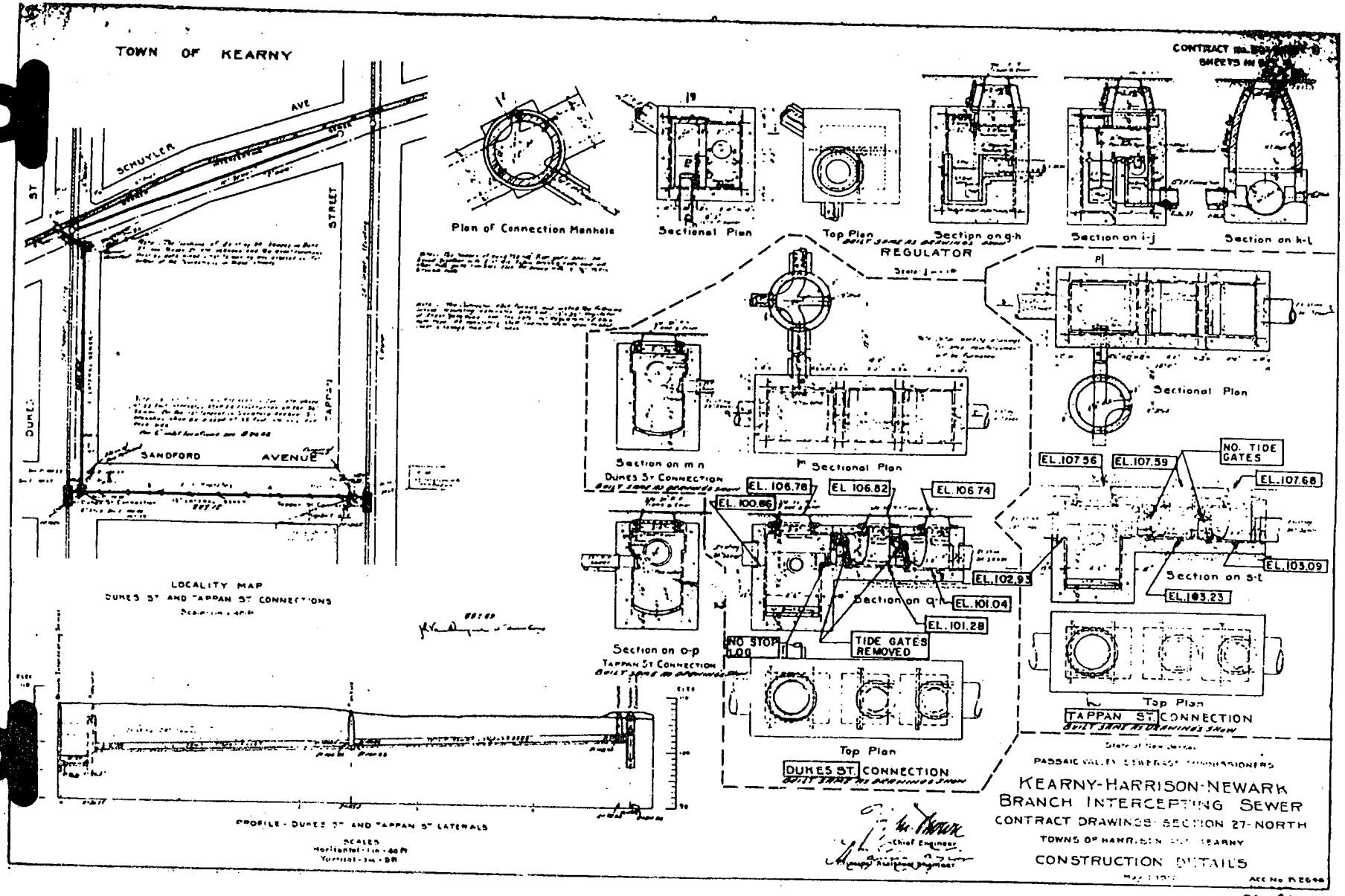


PLATE 8

(3)

KLL001792

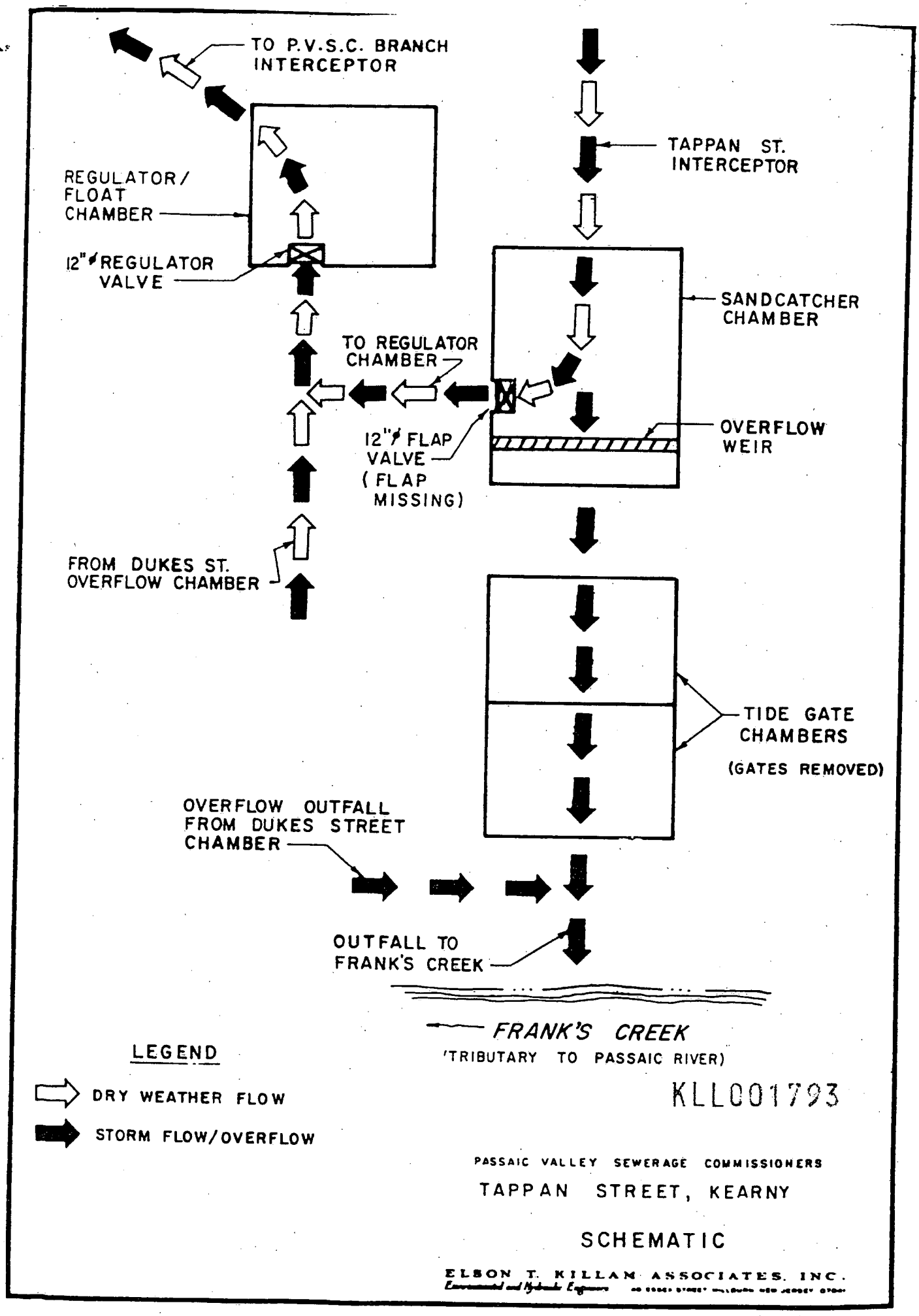
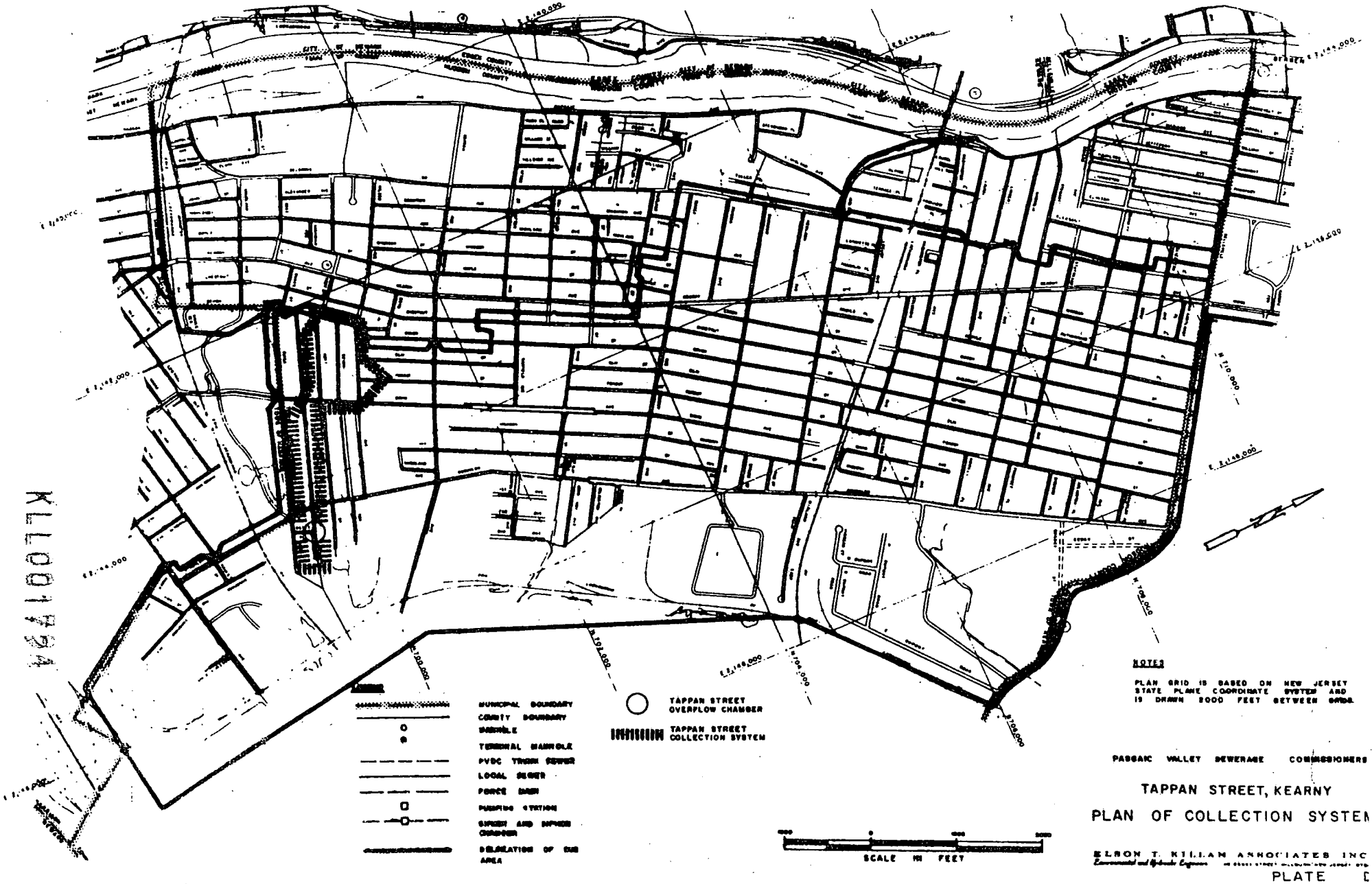

TO P.V.S.C. BRANCH INTERCEPTOR
TAPPAN ST. INTERCEPTOR
REGULATOR/ FLOAT CHAMBER
12"ø REGULATOR VALVE
SANDCATCHER CHAMBER
TO REGULATOR CHAMBER
OVERFLOW WEIR
12"ø FLAP VALVE (FLAP MISSING)
FROM DUKES ST. OVERFLOW CHAMBER
TIDE GATE CHAMBERS
(GATES REMOVED)
OVERFLOW OUTFALL FROM DUKES STREET CHAMBER
OUTFALL TO FRANK'S CREEK
FRANK'S CREEK
(TRIBUTARY TO PASSAIC RIVER)
LEGEND
DRY WEATHER FLOW
STORM FLOW/OVERFLOW
KLL001793
PASSAIC VALLEY SEWERAGE COMMISSIONERS
TAPPAN STREET, KEARNY
SCHEMATIC
ELSON T. KILLAM ASSOCIATES, INC.

PLATE C


MUNICIPAL BOUNDARY
COUNTY BOUNDARY
MANHOLE
TERMINAL MANHOLE
PVDC TRUNK SEWER
LOCAL SEWER
FORCE MAIN
PUMPING STATION
SIPHON AND SIPHON CHAMBER
DELINEATION OF SUB AREA
TAPPAN STREET OVERFLOW CHAMBER
TAPPAN STREET COLLECTION SYSTEM
SCALE IN FEET
NOTES
PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.
PASSAIC VALLEY SEWERAGE COMMISSIONERS
TAPPAN STREET, KEARNY
PLAN OF COLLECTION SYSTEM
ELSON T. KILLAM ASSOCIATES INC
PLATE

KLL001794

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

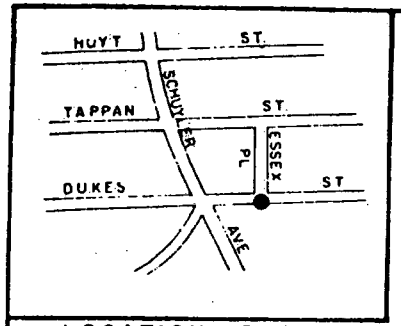
PASSAIC RIVER OVERFLOWS

DUKES STREET, KEARNY
K-010

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

KLL001795



LOCATION PLAN

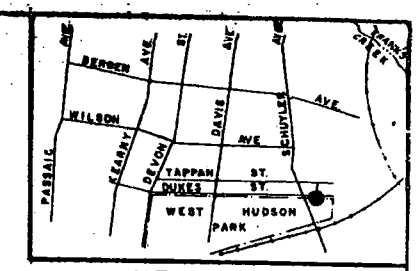
SCALE IN FEET

LEGEND

→ DIRECTION OF FLOW
S.C = SAND CATCHER
V T P = VITRIFIED TILE PIPE
UP STR = UPSTREAM
DN STR = DOWNSTREAM
N T S = NOT TO SCALE
● = OVERFLOW LOCATION

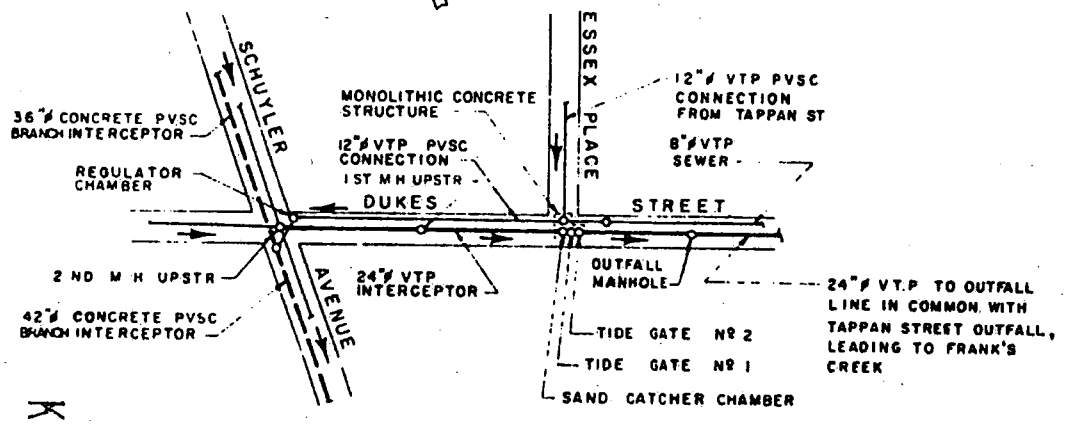
NOTES

1. ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.
2. THE TAPPAN AND DUKES STREET OUTFALLS JOIN INTO A COMMON OUTFALL PIPE WHICH EMPTIES INTO AN OPEN DITCH IN THE MEADOWLANDS ALONG THE ERIE – LACKAWANNA RAILROAD.



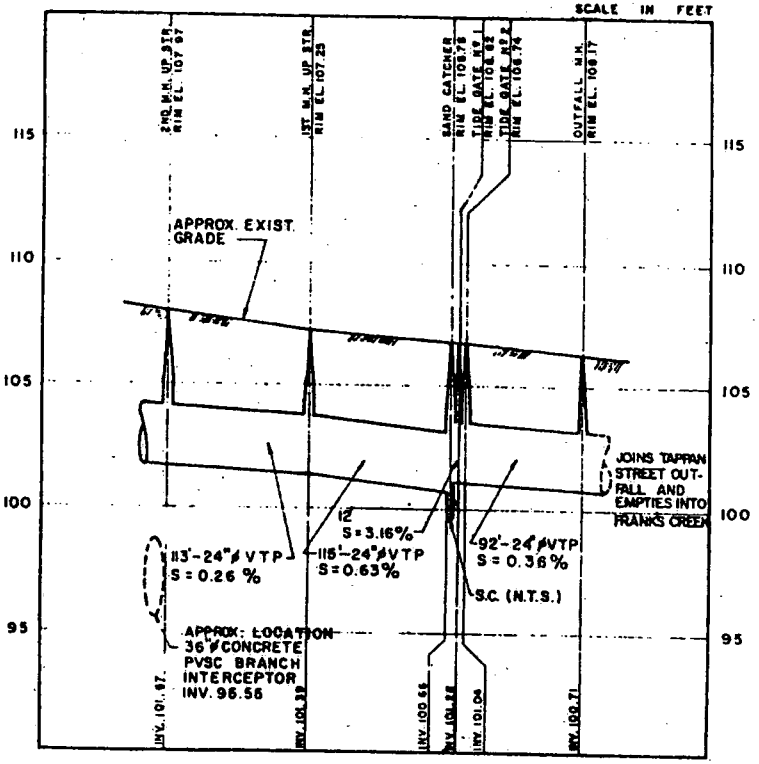
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

KLL001796

ALL ELEVATIONS BASED ON G.M. Nº 1891 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER K-010

DUKES STREET, KEARNY

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC

Environmental and Hydraulic Engineers

PLATE

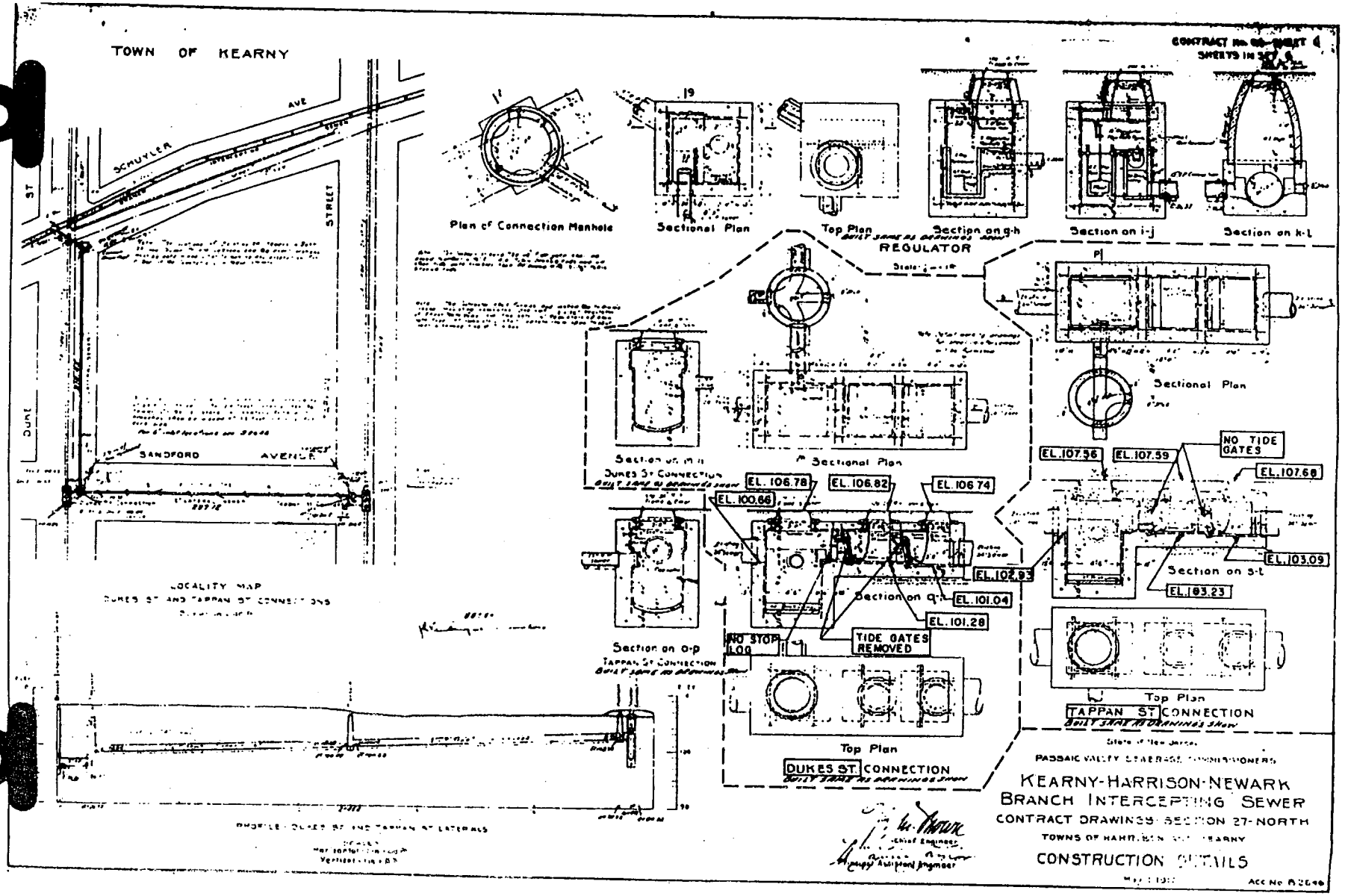
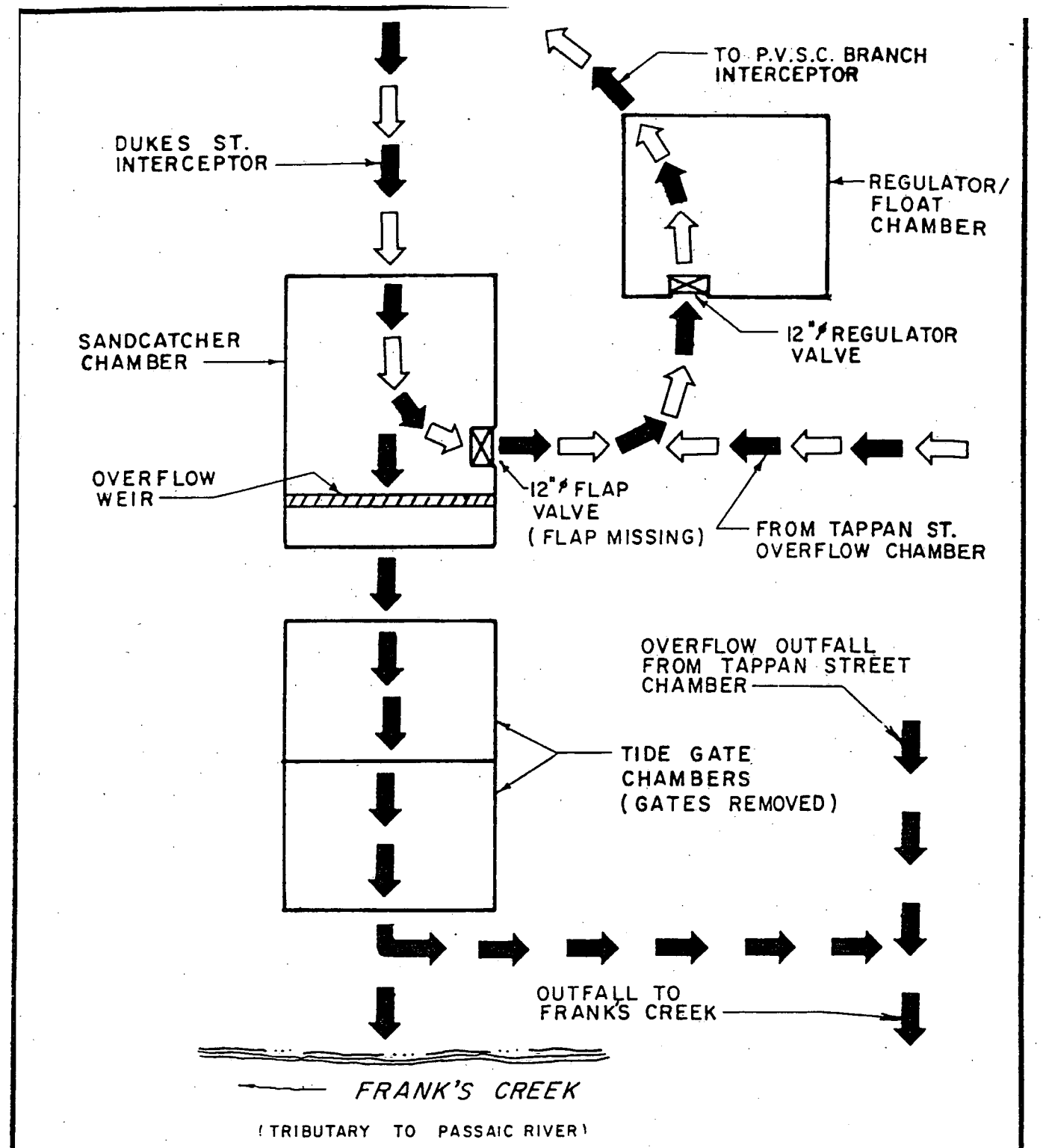


PLATE B

DUKES ST, TAPPAN ST (2)

KLL001797



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001798

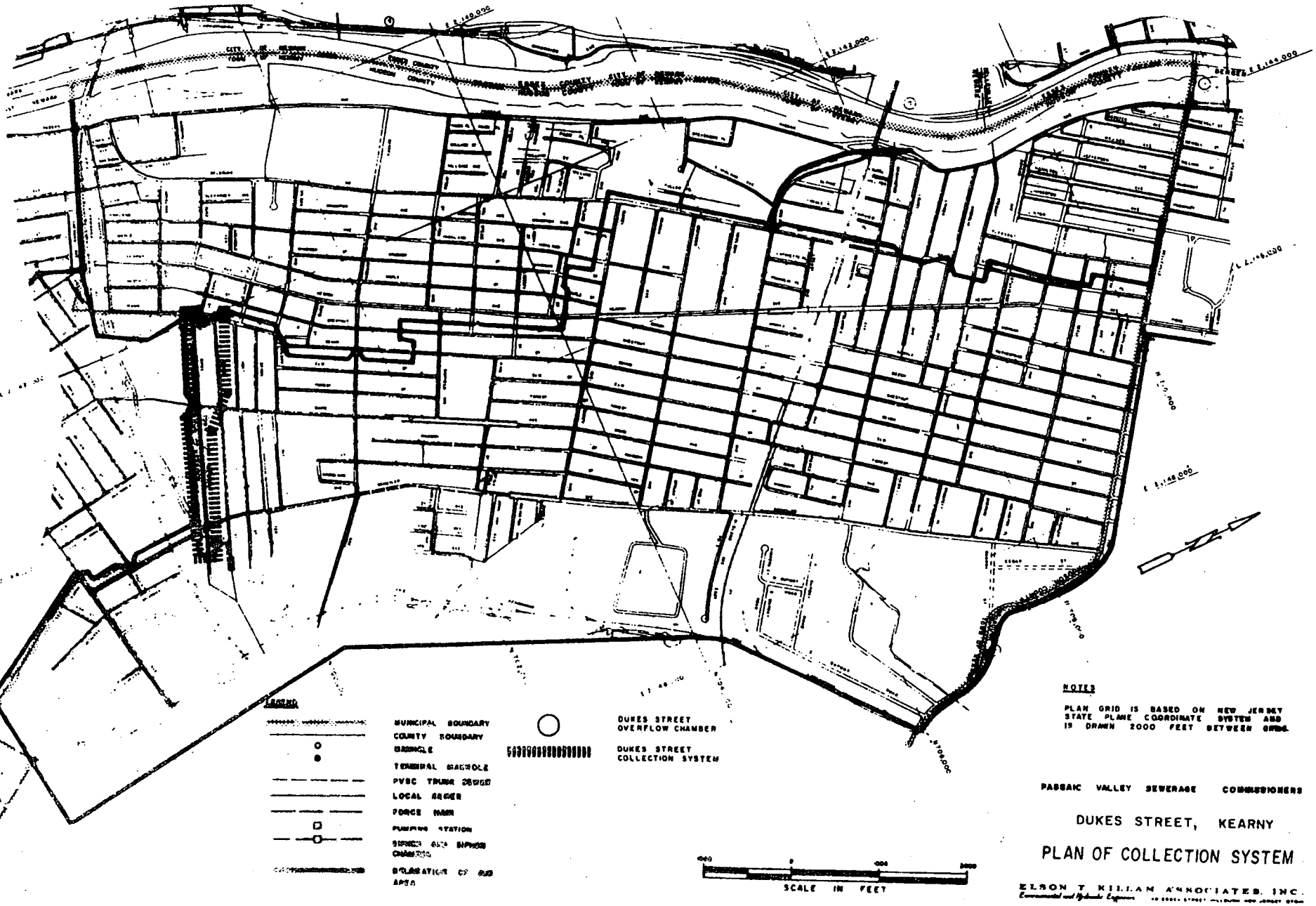
PASSAIC VALLEY SEWERAGE COMMISSIONERS

DUKES STREET, KEARNY

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.
Consulting and Hydraulic Engineers

PLATE C


LEGEND
MUNICIPAL BOUNDARY
COUNTY BOUNDARY
MANHOLE
TERMINAL MANHOLE
PVSC TRUNK SEWER
LOCAL SEWER
FORCE MAIN
PUMPING STATION
DUKES STREET OVERFLOW CHAMBER
DUKES STREET COLLECTION SYSTEM
SCALE IN FEET
NOTES
PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.
PASSAIC VALLEY SEWERAGE COMMISSIONERS
DUKES STREET, KEARNY
PLAN OF COLLECTION SYSTEM
ELSON T. KILLAM ASSOCIATES, INC.
PLATE

KLL001799

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

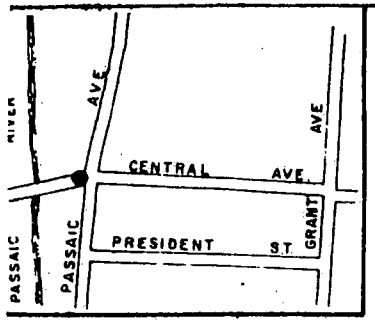
PASSAIC RIVER OVERFLOWS

CENTRAL AVENUE, EAST NEWARK
E-001

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 40 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001000



LOCATION PLAN

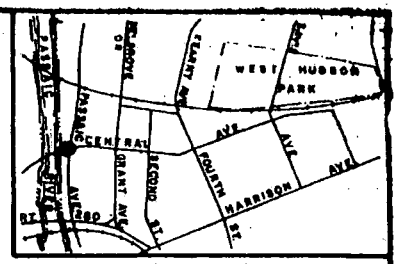
SCALE IN FEET

NOTE

ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

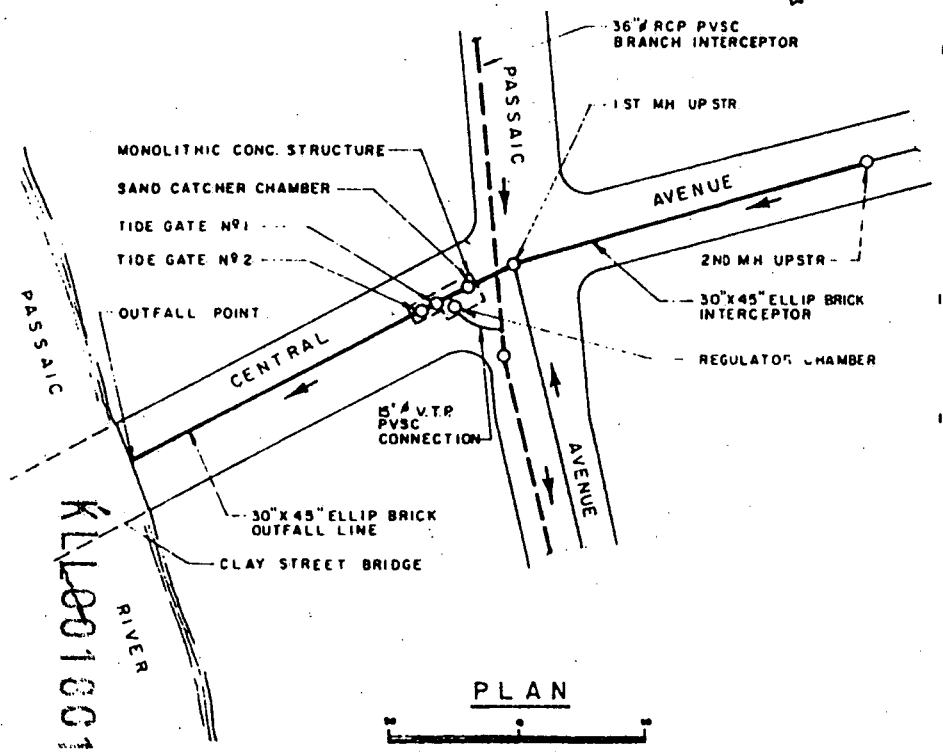
LEGEND

- DIRECTION OF FLOW
- S.C. = SAND CATCHER
- T.G = TIDE GATE
- UP STR. = UPSTREAM
- DN. STR. = DOWNSTREAM
- N.T.S. = NOT TO SCALE
- V.T.P. = VITRIFIED TILE PIPE
- R.C.P. = REINFORCED CONCRETE PIPE
- ● = OVERFLOW LOCATION



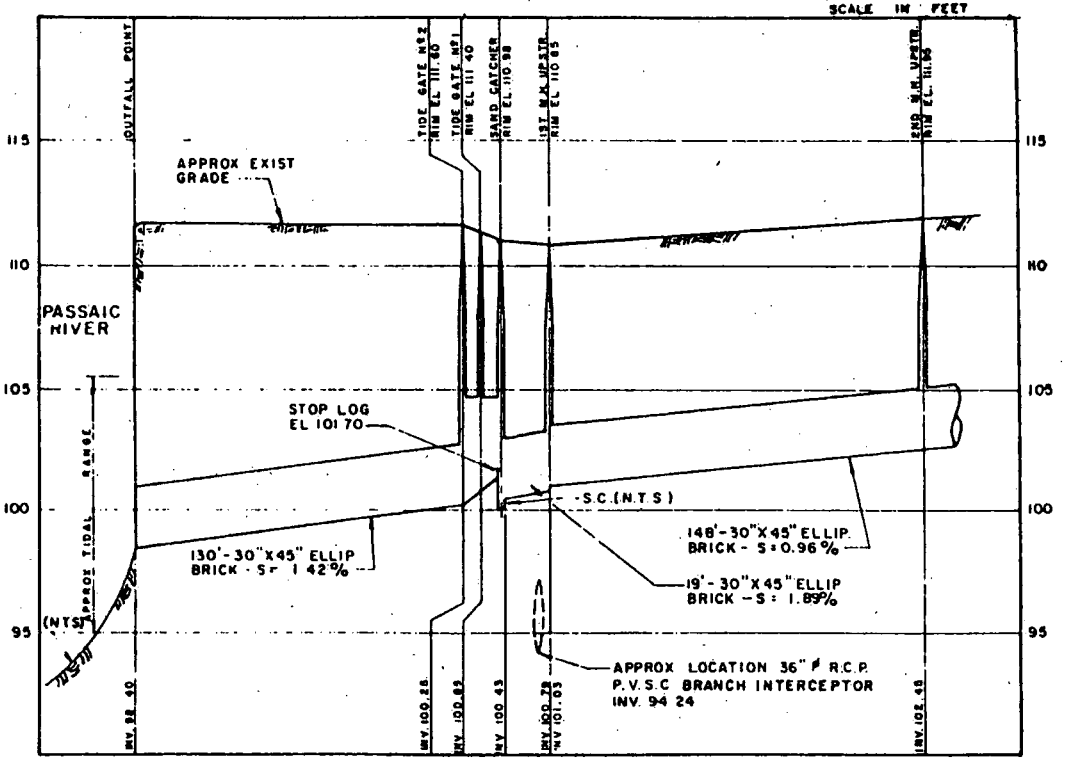
KEY MAP

SCALE IN FEET



PLAN

HORIZ. SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER E-001

CENTRAL AVENUE, EAST NEWARK

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

K-L001001

L ELEVATIONS BASED ON
M. NO 1964 AS ESTABLISHED BY
W JERSEY GEODETIC CONTROL SURVEY
R LOCATION AND DESCRIPTION
C APPENDIX.

PLATE A

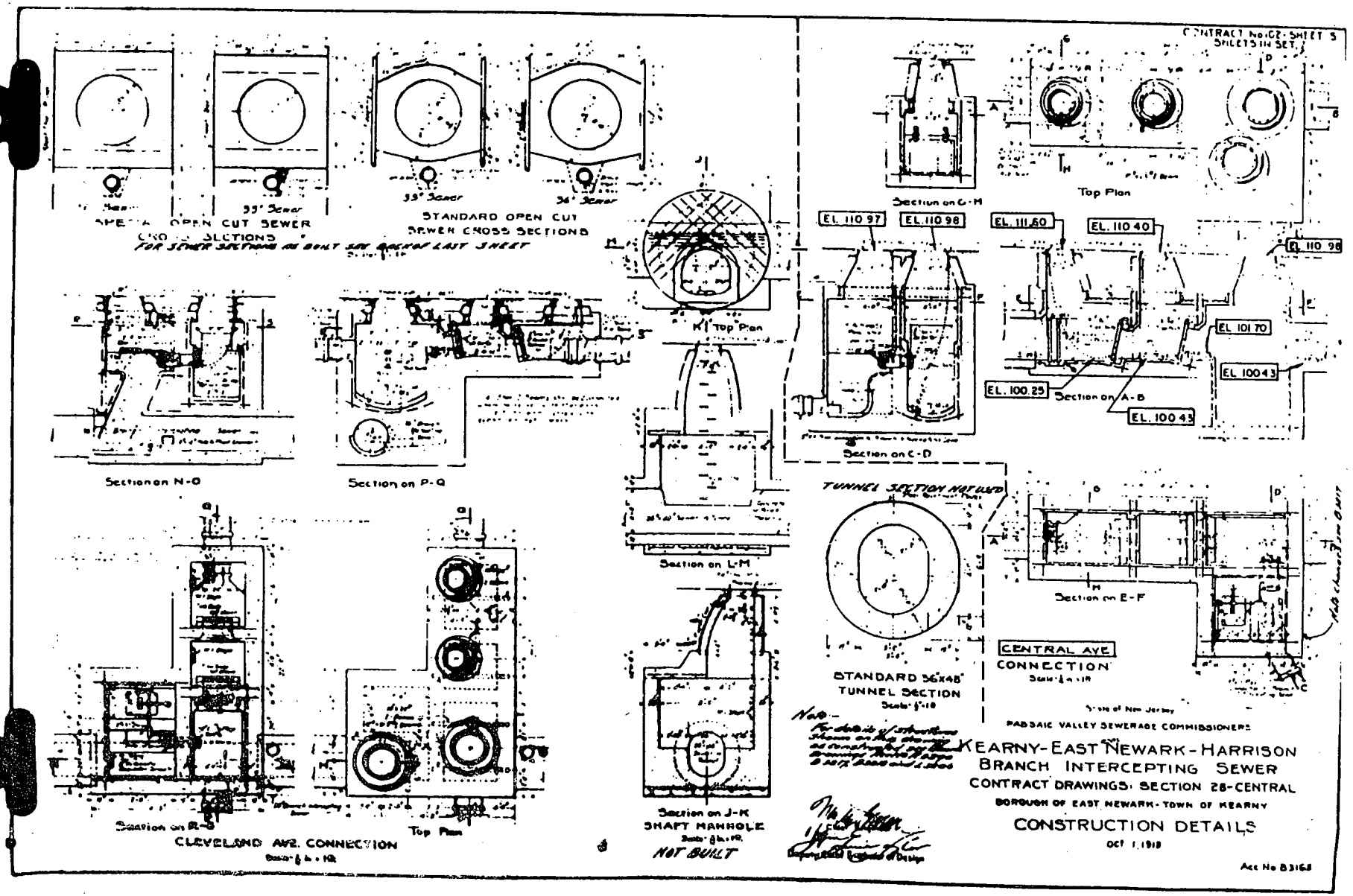
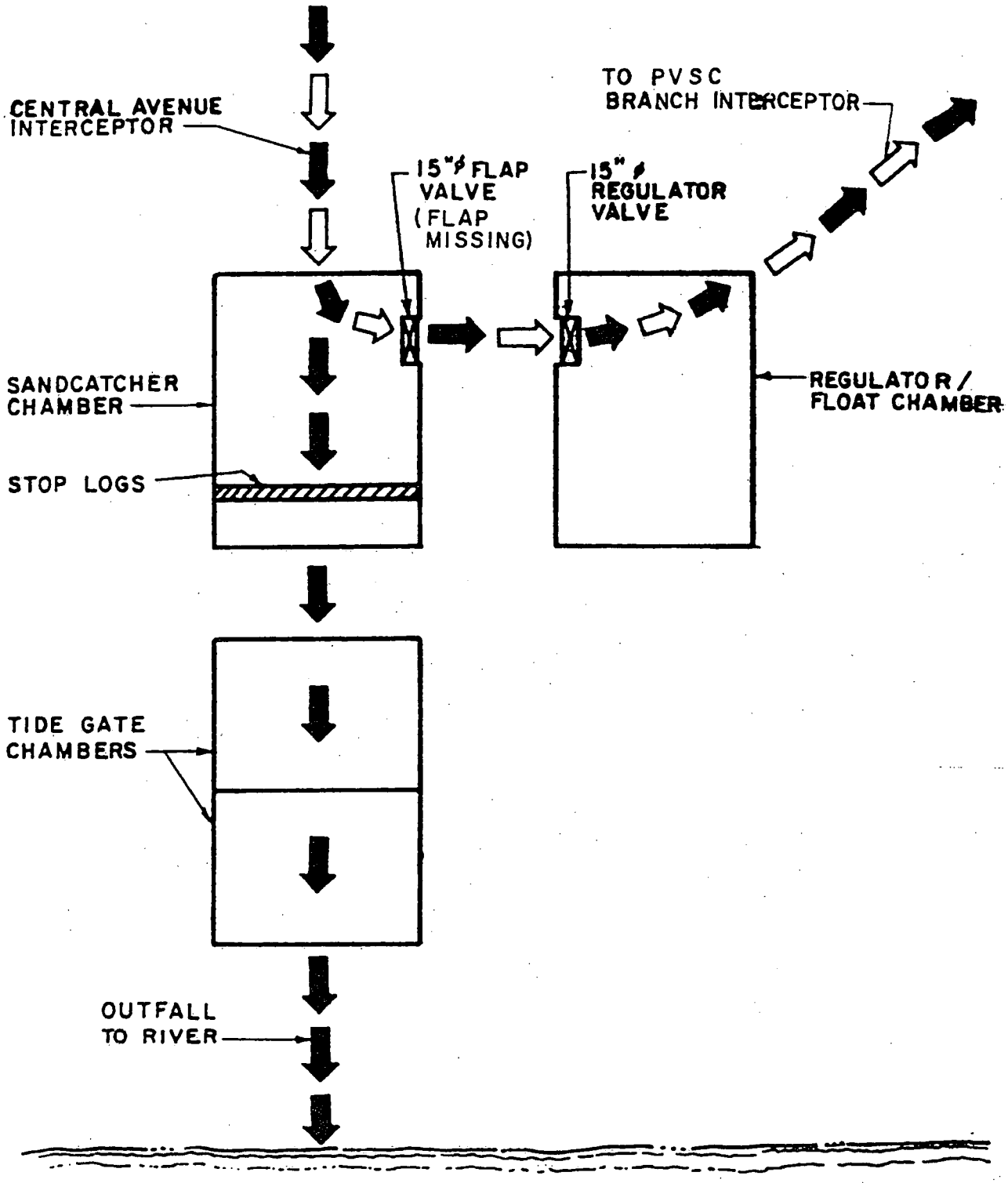


PLATE B

KLL001802



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001803

PASSAIC VALLEY SEWERAGE COMMISSIONERS

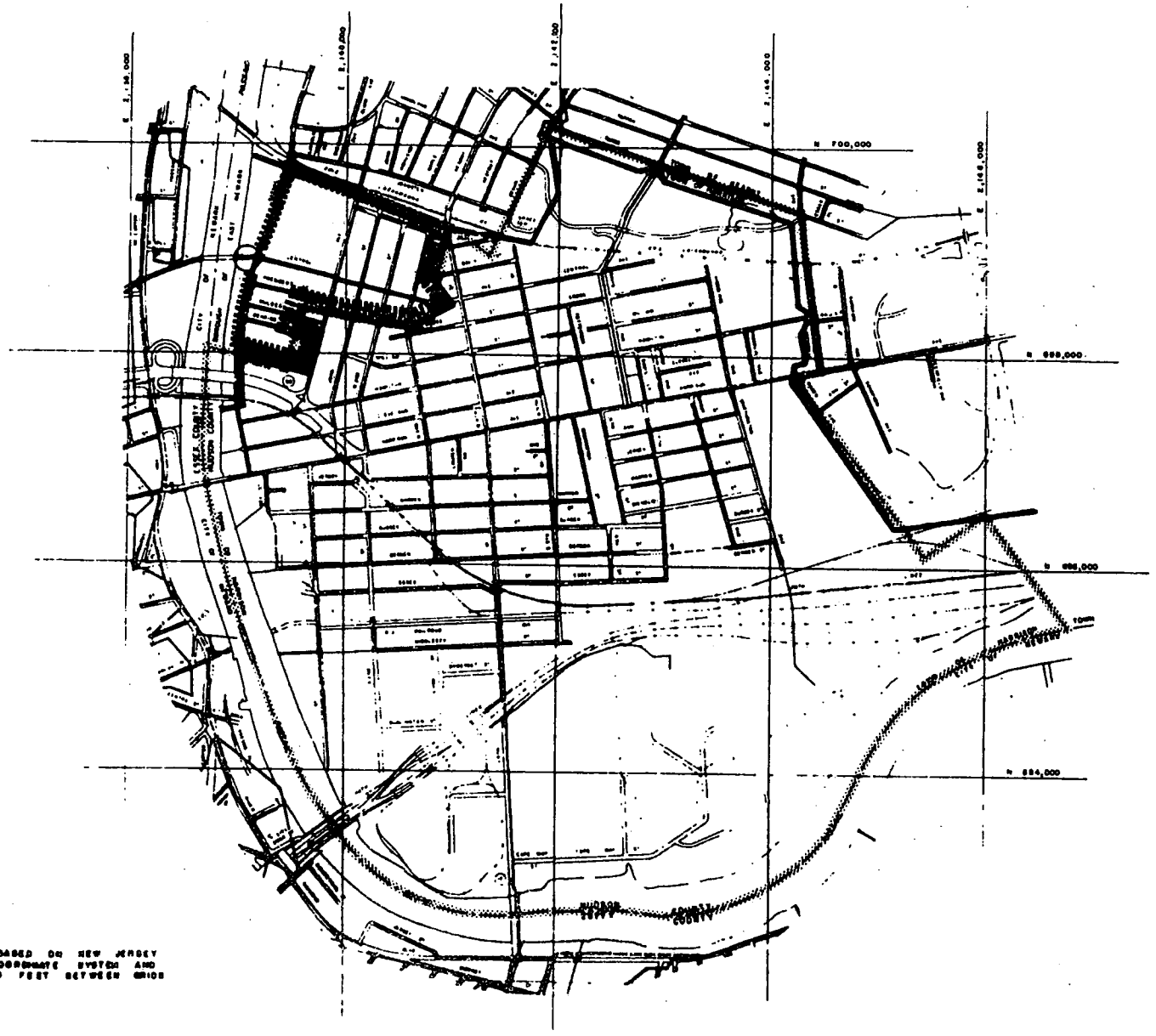
CENTRAL AVENUE, EAST NEWARK

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE C



LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- CENTRAL AVENUE OVERFLOW CHAMBER
- CENTRAL AVENUE COLLECTION SYSTEM

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS

PASSAIC VALLEY SEWERAGE COMMISSIONERS

CENTRAL AVENUE, EAST NEWARK

PLAN OF COLLECTION SYSTE

ELSON T. KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

PLATE 1

KLL001804

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

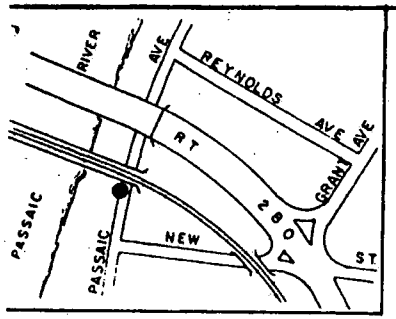
PASSAIC RIVER OVERFLOWS

NEW (HAMILTON) STREET, HARRISON
H-001

1976

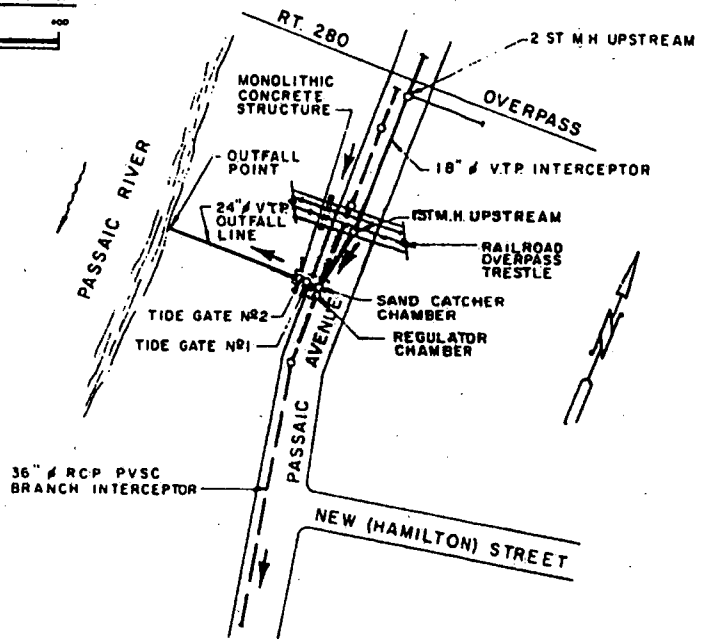
ELSON T. KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers
48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001805



LOCATION PLAN

SCALE IN FEET



PLAN

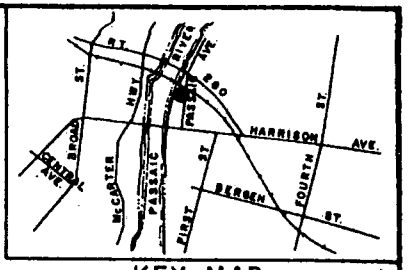
SCALE IN FEET

NOTE

ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

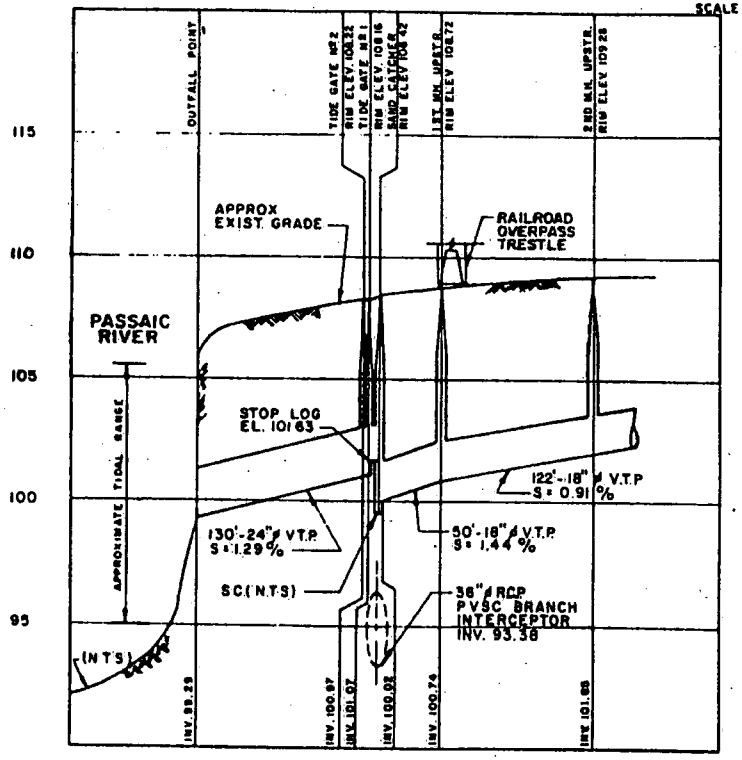
LEGEND

- → DIRECTION OF FLOW
- S.C. = SAND CATCHER
- T.G. = TIDE GATE
- UP STR. = UPSTREAM
- DN. STR. = DOWNSTREAM
- N.T.S. = NOT TO SCALE
- V.T.P. = VITRIFIED TILE PIPE
- R.C.P. = REINFORCED CONCRETE PIPE
- ● = OVERFLOW LOCATION



KEY MAP

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER H-001

NEW (HAMILTON) STREET, HARRISON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Consulting and Hydraulic Engineers

KLLC01806

ALL ELEVATIONS BASED ON M. 49 1264 AS ESTABLISHED BY THE NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PLATE A

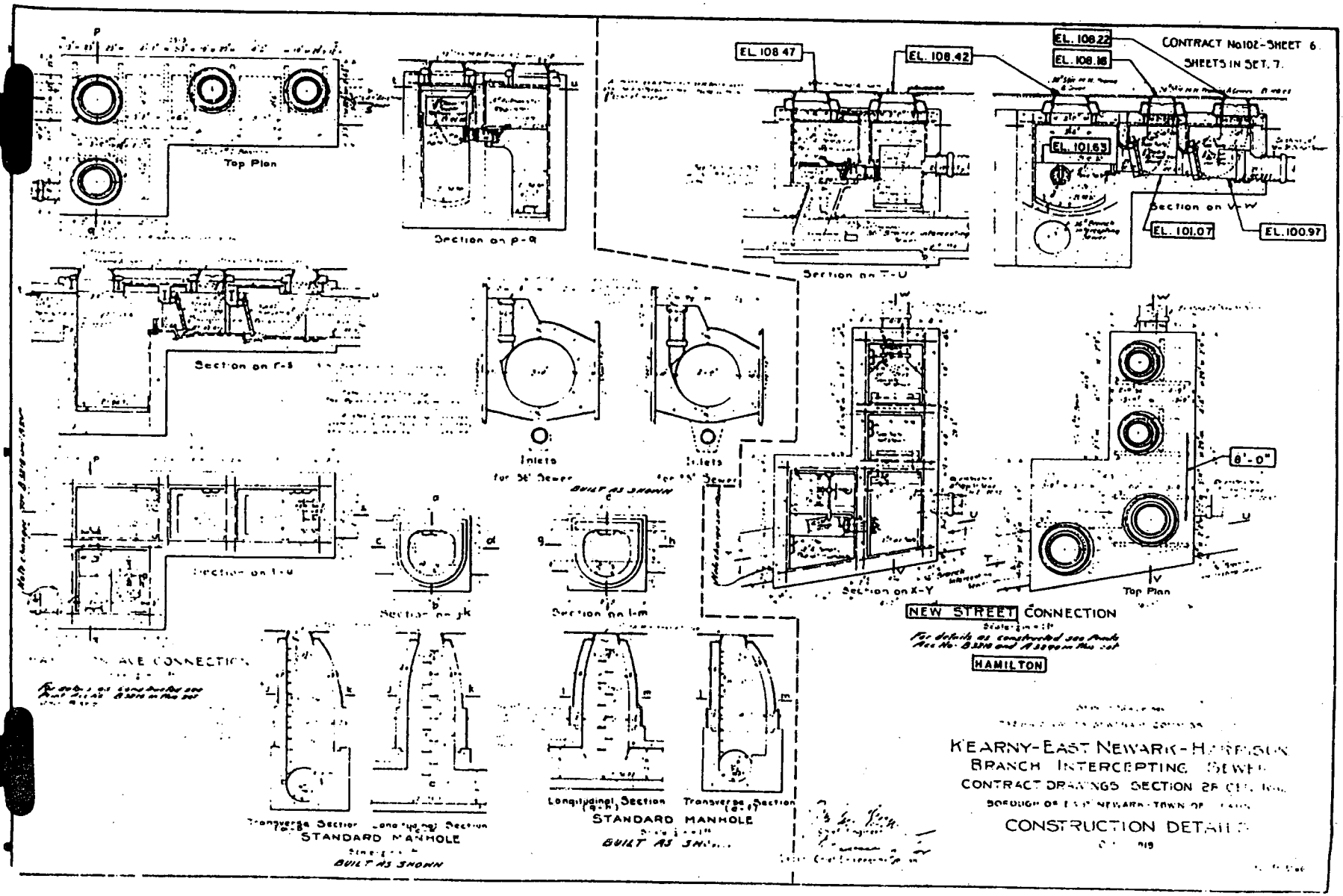
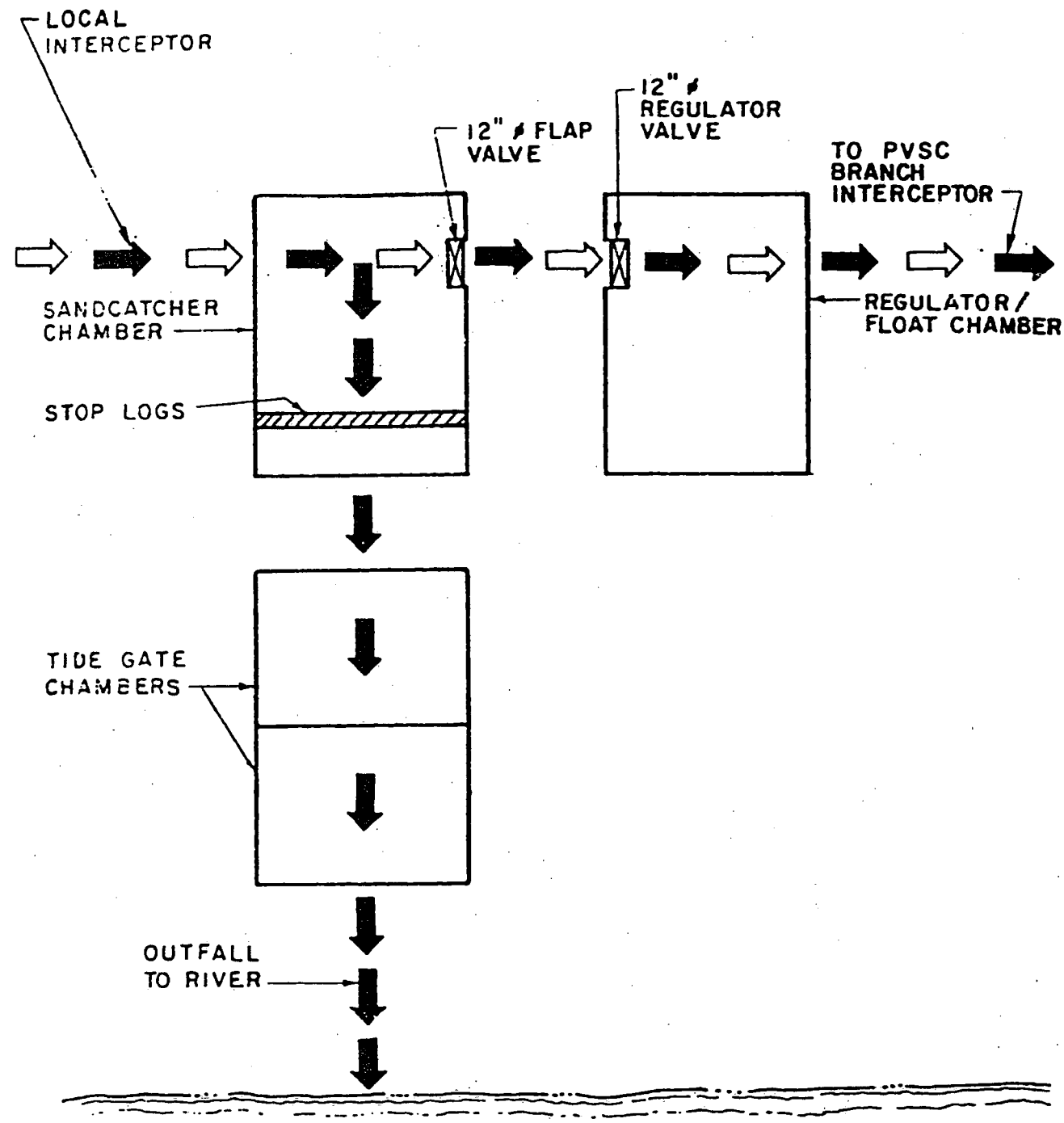


PLATE B

KLLCO[redacted]07



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001808

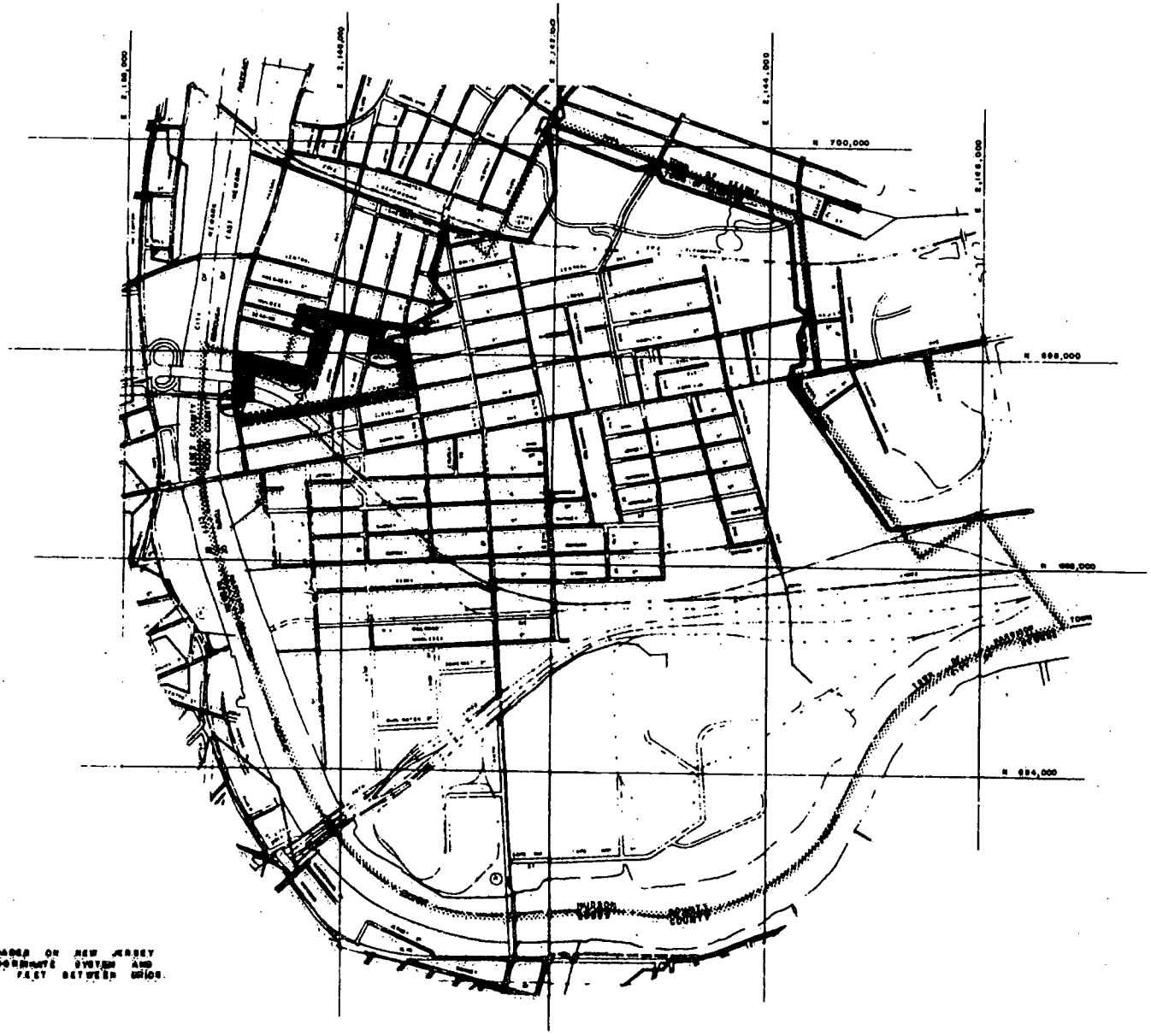
PASSAIC VALLEY SEWERAGE COMMISSIONERS

NEW (HAMILTON) STREET, HARRISON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC.

PLATE C



LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- NEW (HAMILTON) STREET OVERFLOW CHAMBER
- NEW (HAMILTON) STREET COLLECTION SYSTEM

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 5000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

NEW (HAMILTON) STREET, HARRISC

PLAN OF COLLECTION SYSTEI

ELSON T. KILLAM ASSOCIATES INC

Consulting and Hydraulic Engineers

PLATE D

KLL001809

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

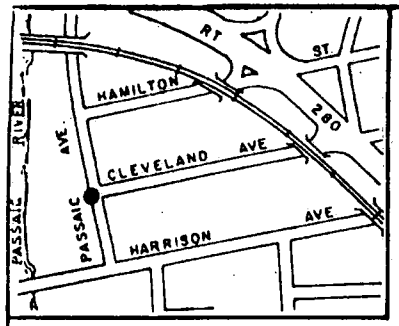
PASSAIC RIVER OVERFLOWS

CLEVELAND AVENUE, HARRISON
H-002

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 40 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001810

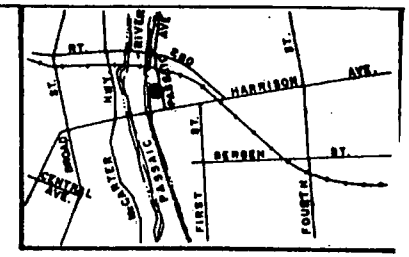


LOCATION PLAN

SCALE IN FEET

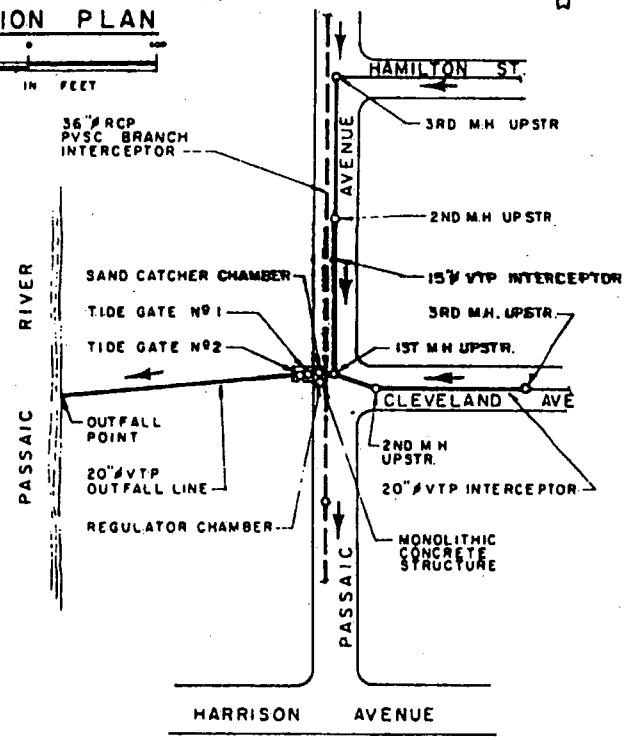
NOTE
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

LEGEND
→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T. G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
R.C.P. = REINFORCED CONCRETE
● = OVERFLOW LOCATION



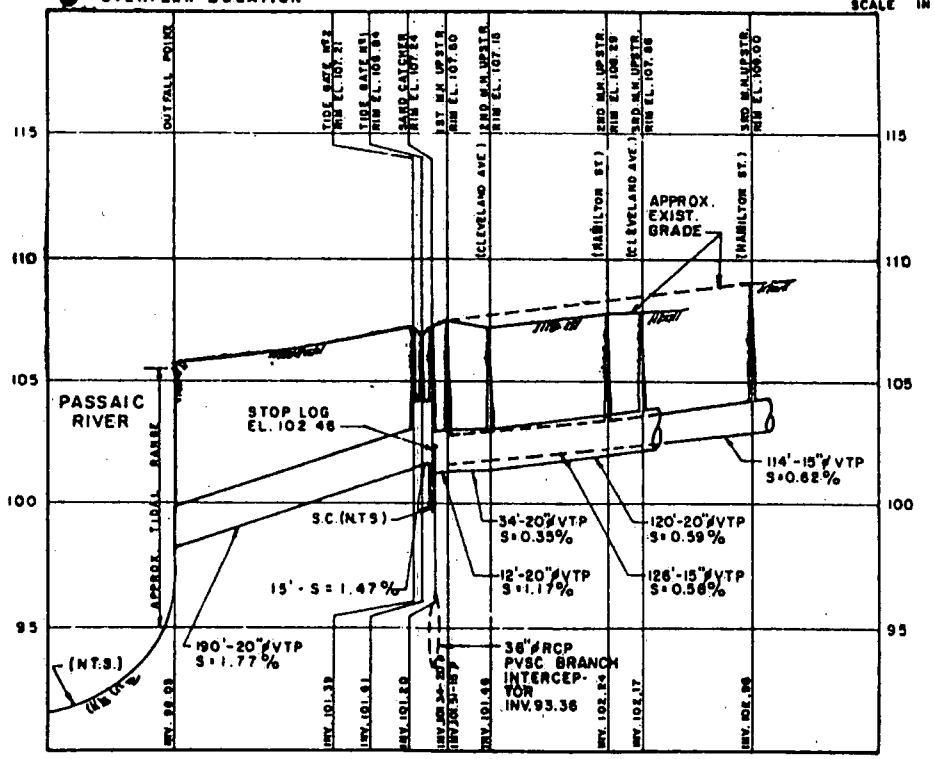
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

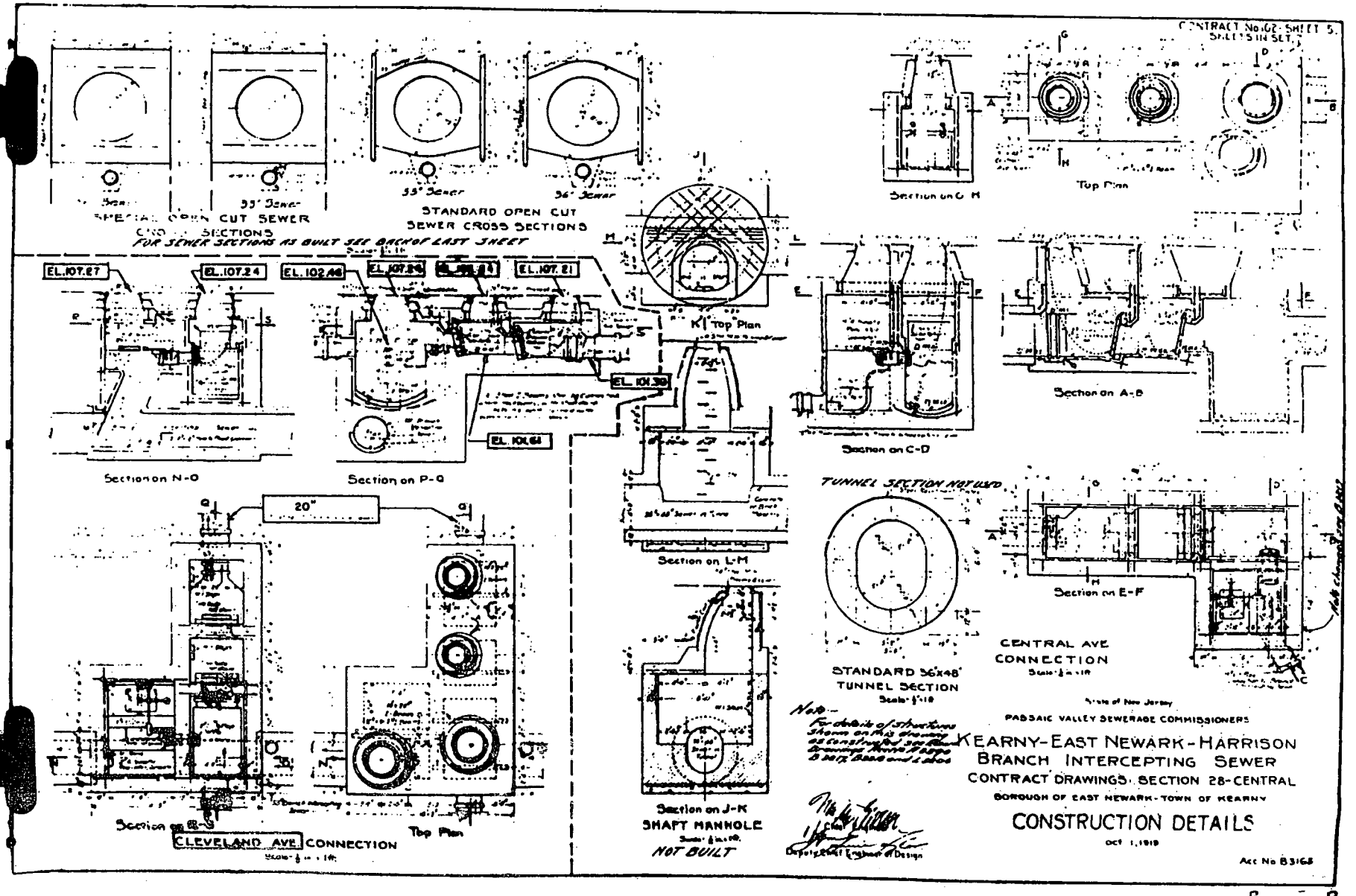
VERT. SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS
OVERFLOW CHAMBER H-002
CLEVELAND AVENUE, HARRISON
PLAN AND PROFILE
ELSON T. KILLAM ASSOCIATES, INC.
Consulting and Hydraulic Engineers

ALL ELEVATIONS BASED ON B.M. NO 1394 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

KL1001811

PLATE


CONTRACT No. 62 SHEET 5. SHEETS IN SET
SPECIAL OPEN CUT SEWER CROSS SECTIONS
FOR SEWER SECTIONS AS BUILT SEE BACK OF LAST SHEET
33" Sewer
36" Sewer
STANDARD OPEN CUT SEWER CROSS SECTIONS
Section on G-H
Top Plan
EL. 107.27
EL. 107.24
EL. 102.46
EL. 107.24
EL. 107.21
EL. 101.30
EL. 101.61
Section on N-O
Section on P-Q
K Top Plan
Section on C-D
Section on A-B
Section on L-M
TUNNEL SECTION NOT USED
Section on E-F
CENTRAL AVE CONNECTION
STANDARD 36"x48" TUNNEL SECTION
20"
Section on B-S
CLEVELAND AVE CONNECTION
Top Plan
Section on J-K
SHAFT MANHOLE
NOT BUILT
Note—
For details of structures shown on this drawing as constructed see Rear Drawings Nos. B 3212, B 3213 and B 3214
State of New Jersey
PASSAIC VALLEY SEWERAGE COMMISSIONERS
KEARNY-EAST NEWARK-HARRISON
BRANCH INTERCEPTING SEWER
CONTRACT DRAWINGS. SECTION 28-CENTRAL
BOROUGH OF EAST NEWARK-TOWN OF KEARNY
CONSTRUCTION DETAILS
Oct 1, 1919
Acc No B3168
Deputy Chief Engineer of Design

KLL001812

(3)

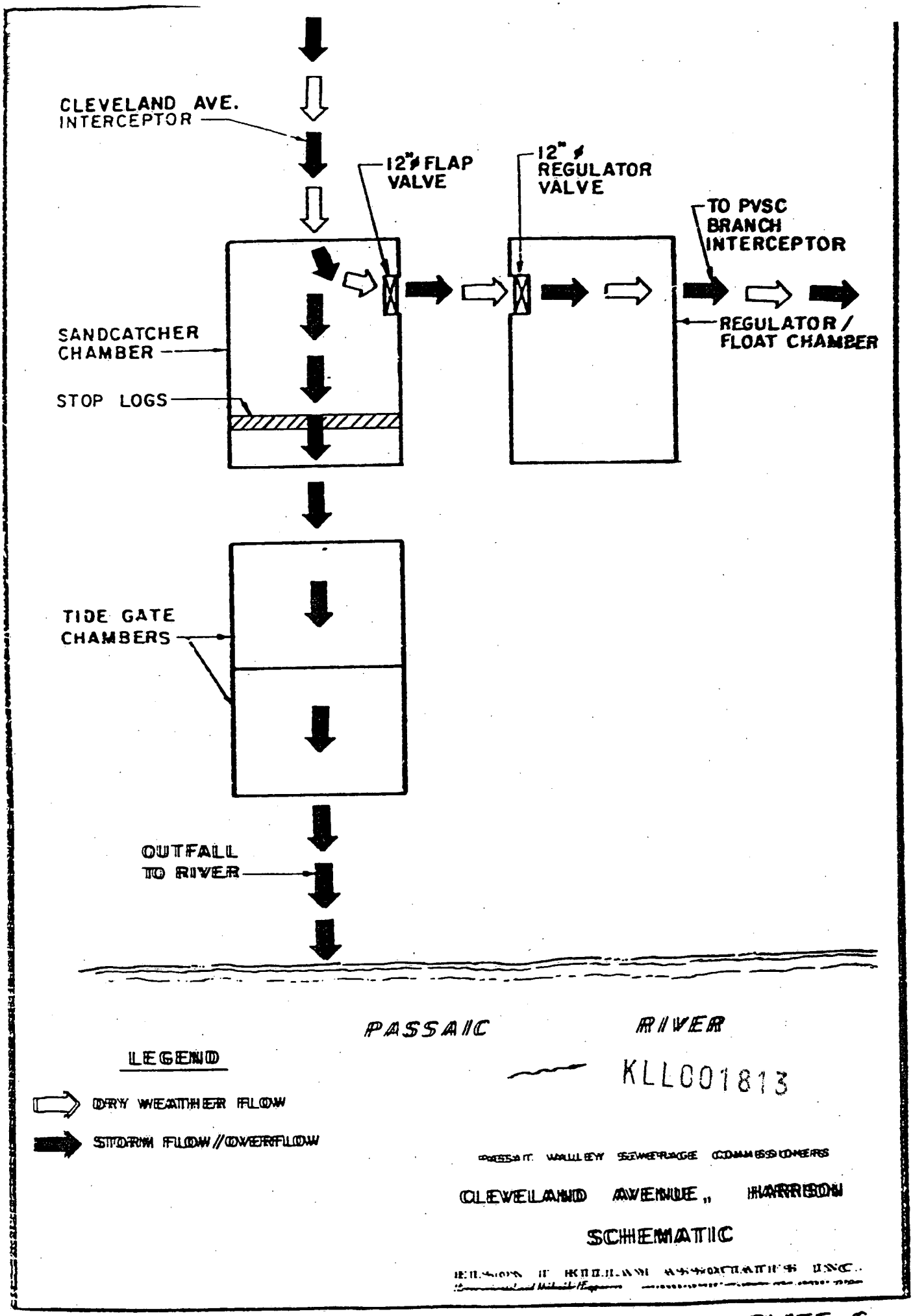
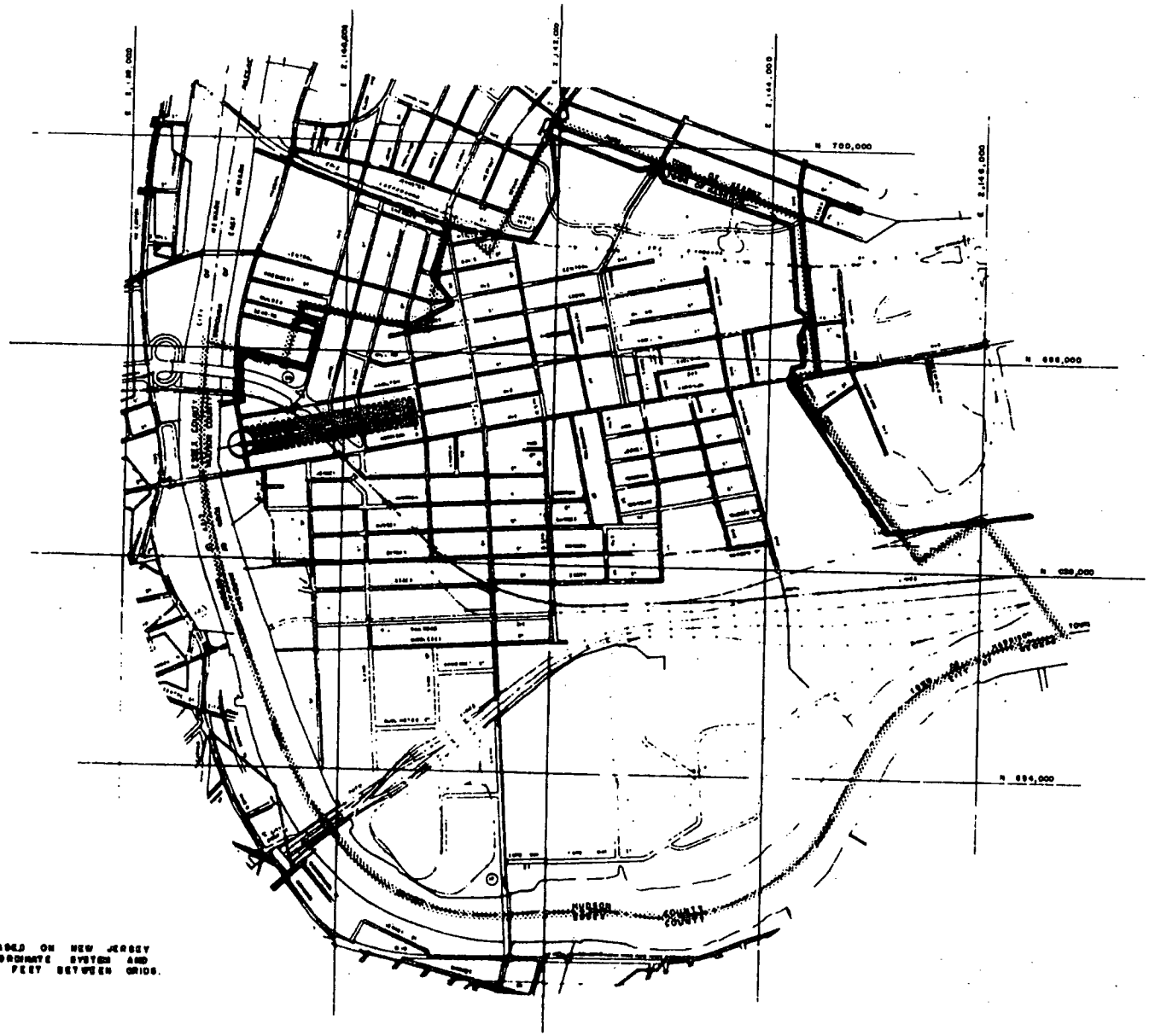

CLEVELAND AVE. INTERCEPTOR
12"ø FLAP VALVE
12" ø REGULATOR VALVE
TO PVSC BRANCH INTERCEPTOR
SANDCATCHER CHAMBER
STOP LOGS
REGULATOR / FLOAT CHAMBER
TIDE GATE CHAMBERS
OUTFALL TO RIVER
PASSAIC RIVER
LEGEND
DRY WEATHER FLOW
STORM FLOW//OVERFLOW
KLL001813
PASSAIC VALLEY SEWERAGE COMMISSIONERS
CLEVELAND AVENUE, HARRISON
SCHEMATIC
ELSON T. KILLAM ASSOCIATES INC.

PLATE C



LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- CLEVELAND AVENUE OVERFLOW CHAMBER
- CLEVELAND AVENUE COLLECTION SYSTEM

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

CLEVELAND AVENUE, HARRISON

PLAN OF COLLECTION SYSTEI

ELSON T. KILLAM ASSOCIATES INC

Environmental and Hydraulic Engineers

PLATE D

KLL001814

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

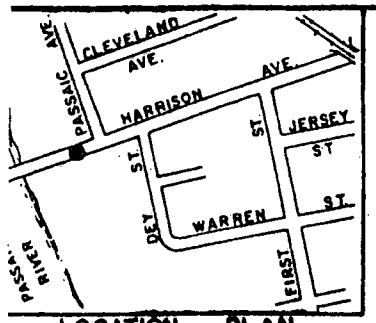
PASSAIC RIVER OVERFLOWS

HARRISON AVENUE, HARRISON
H-003

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers
40 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001815

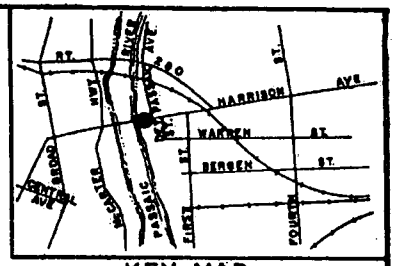


LOCATION PLAN

SCALE IN FEET

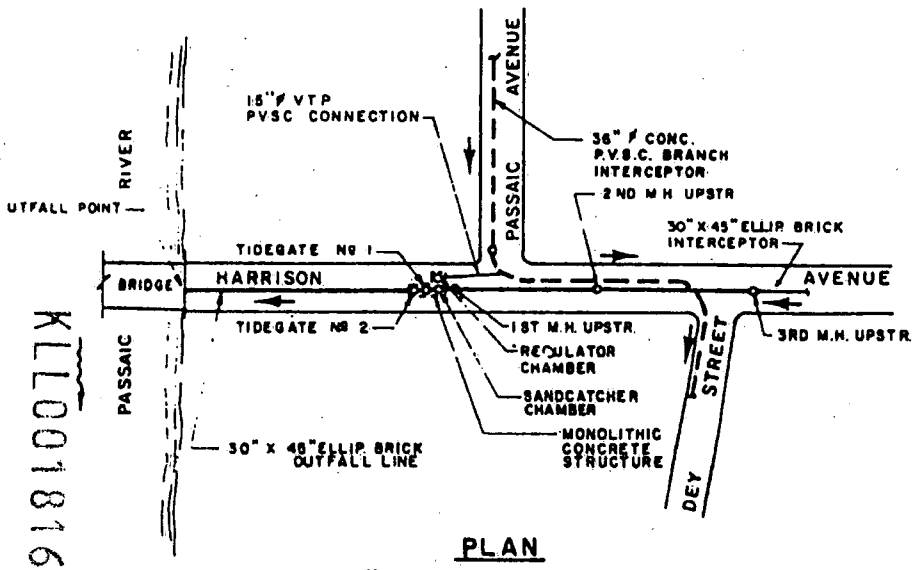
NOTE:
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

LEGEND:
→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
N.T.S. = NOT TO SCALE
● = OVERFLOW LOCATION



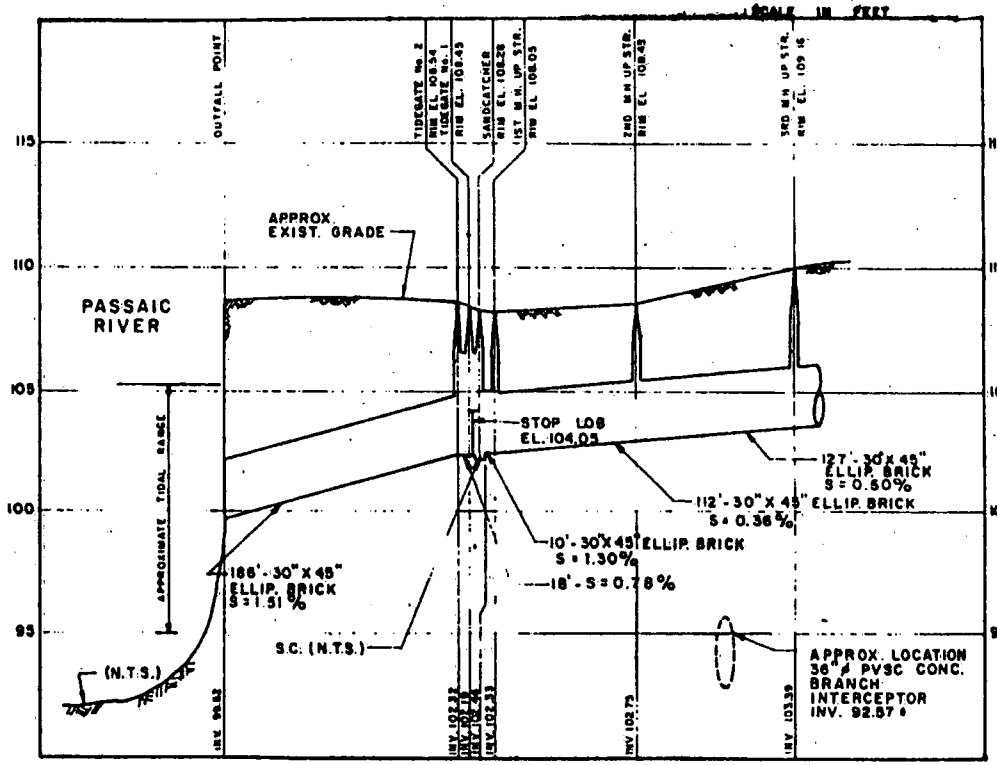
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

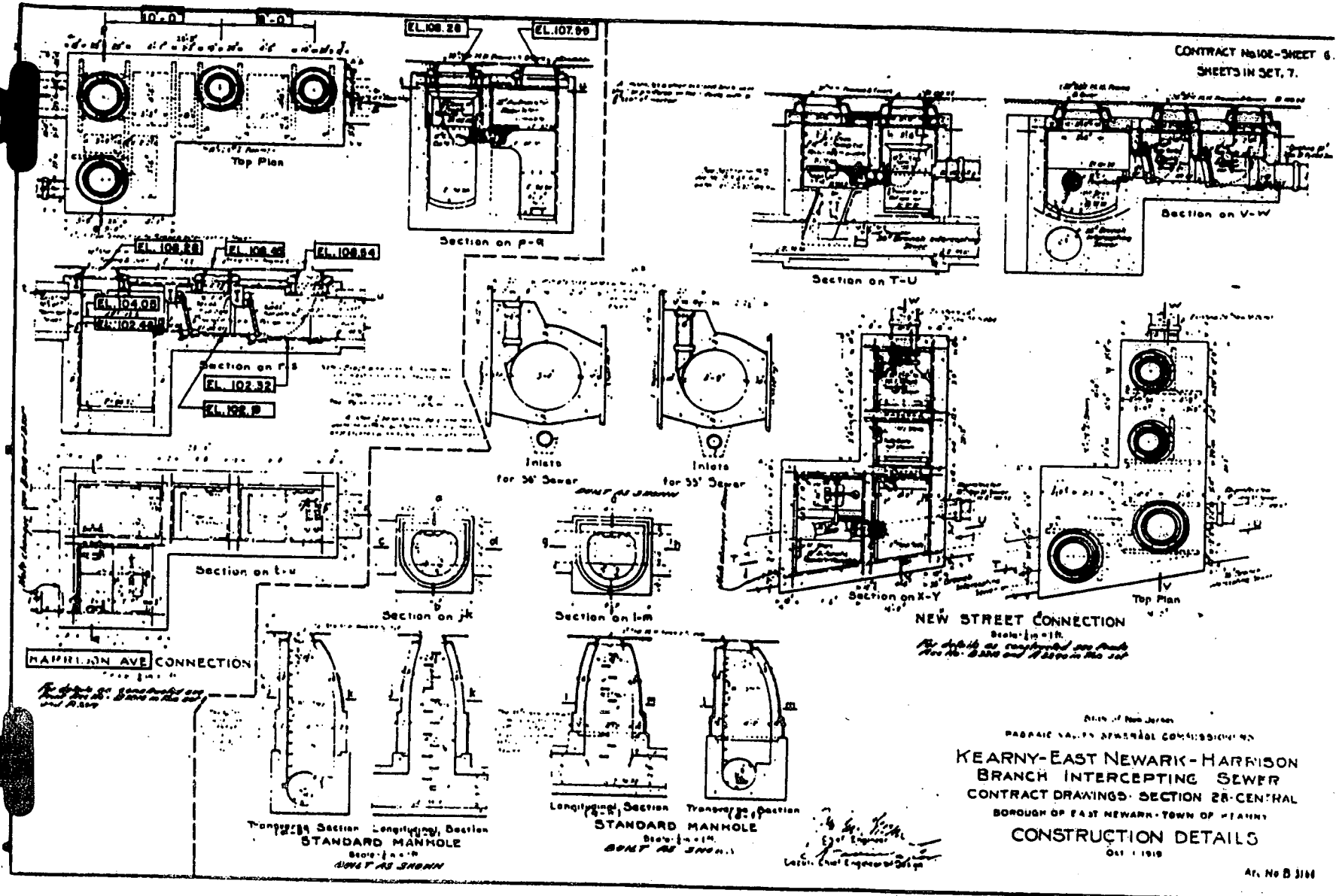
VERT. SCALE IN FEET

...L ELEVATIONS BASED ON ...N. MD 1964 AS ESTABLISHED BY ...O JERSEY GEODETIC CONTROL SURVEY ...R LOCATION AND DESCRIPTION ...E APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS
OVERFLOW CHAMBER H-003
HARRISON AVENUE, HARRISON
PLAN AND PROFILE
ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE A

KLL001816


CONTRACT No 102-SHEET 6.
SHEETS IN SET. 7.
Top Plan
Section on P-Q
Section on T-U
Section on V-W
Section on R-S
Inlets for 36" Sewer
Inlets for 33" Sewer
Section on t-u
Section on jk
Section on l-m
Section on X-Y
Top Plan
NEW STREET CONNECTION
HARRISON AVE CONNECTION
Transverse Section
Longitudinal Section
STANDARD MANHOLE
Longitudinal Section
Transverse Section
STANDARD MANHOLE
KEARNY-EAST NEWARK-HARRISON
BRANCH INTERCEPTING SEWER
CONTRACT DRAWINGS SECTION 28-CENTRAL
CONSTRUCTION DETAILS

(3)

KLL001817

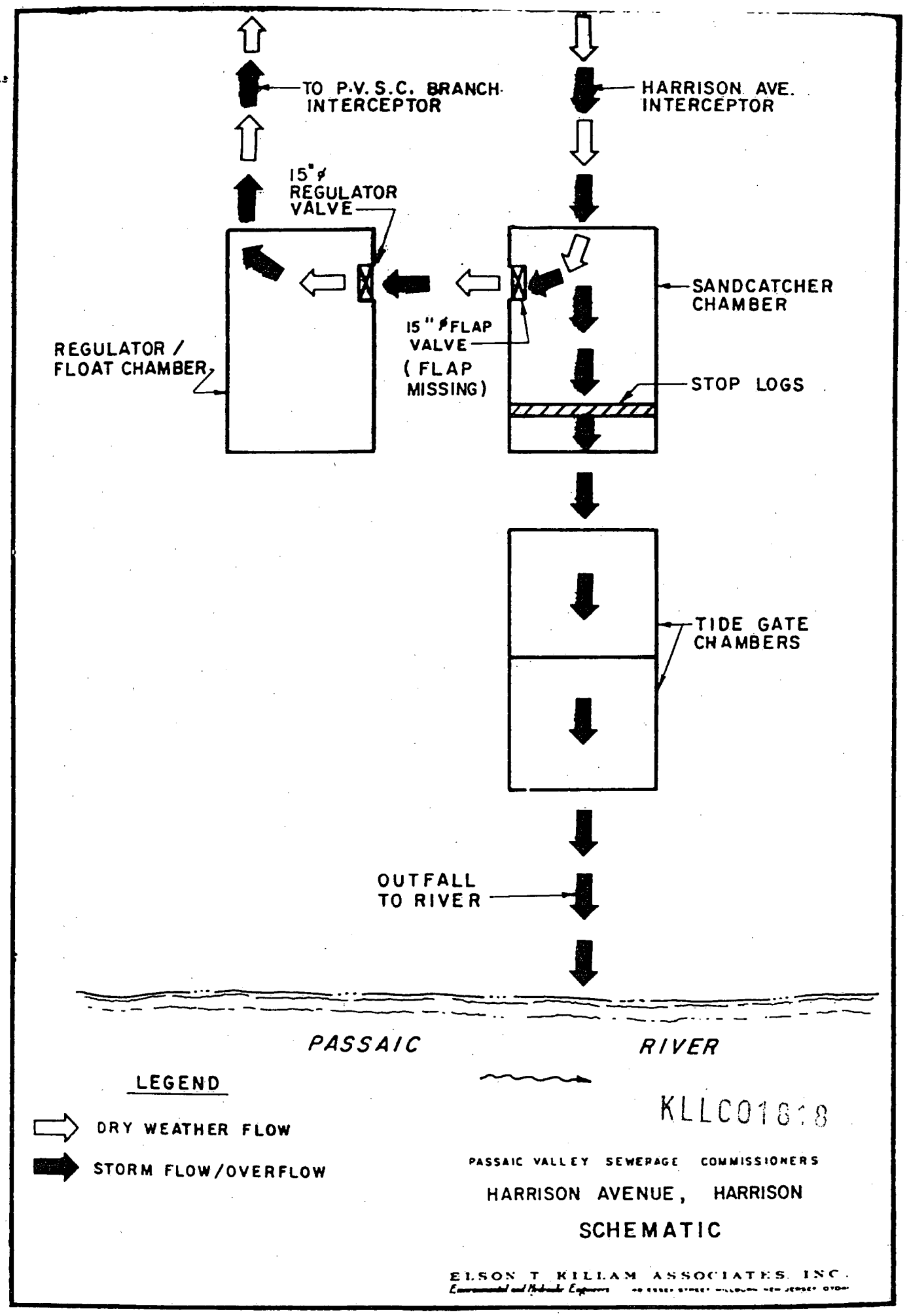
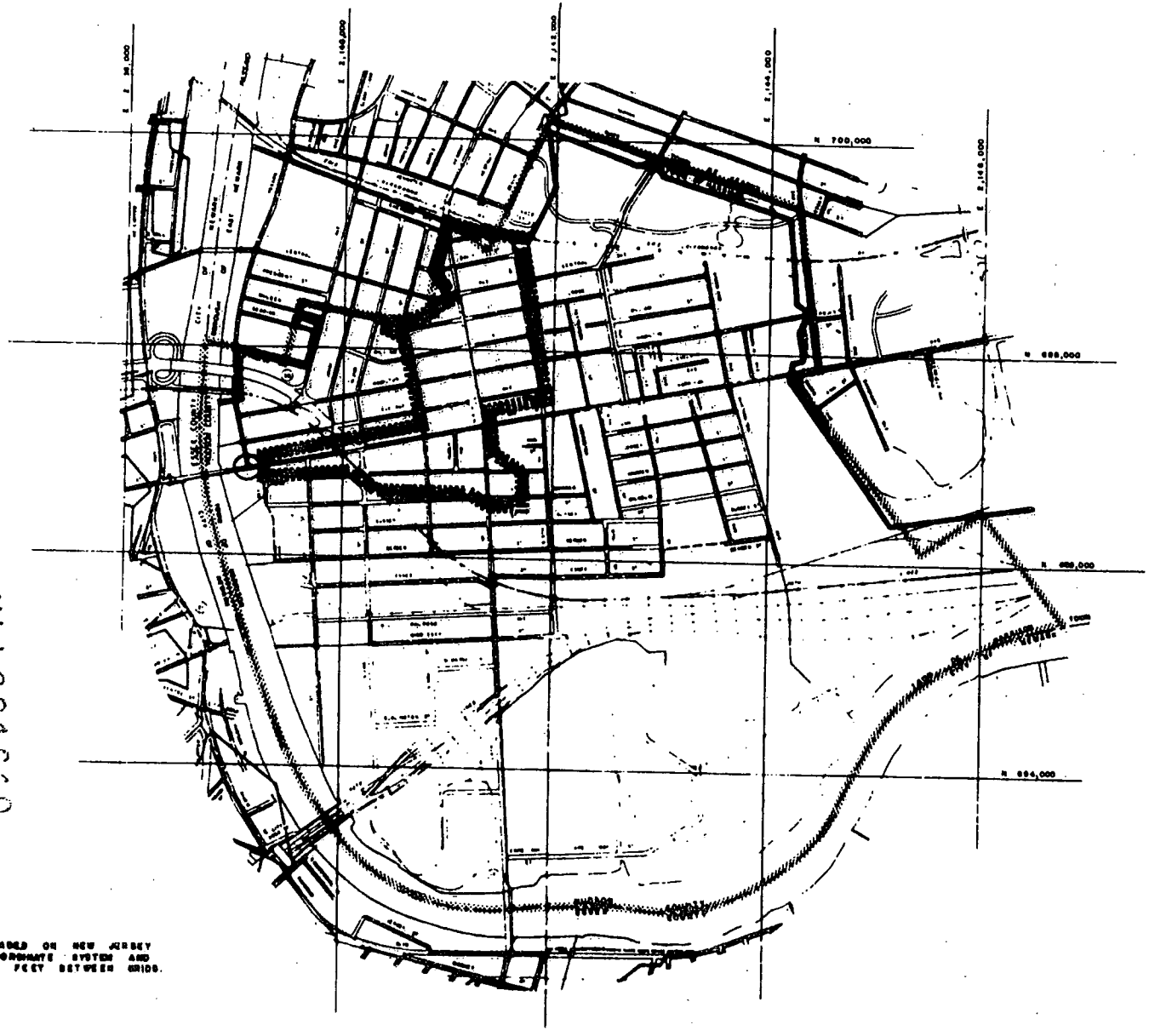

TO P.V.S.C. BRANCH INTERCEPTOR
HARRISON AVE. INTERCEPTOR
15"ø REGULATOR VALVE
SANDCATCHER CHAMBER
15"ø FLAP VALVE
(FLAP MISSING)
REGULATOR / FLOAT CHAMBER
STOP LOGS
TIDE GATE CHAMBERS
OUTFALL TO RIVER
PASSAIC RIVER
LEGEND
DRY WEATHER FLOW
STORM FLOW/OVERFLOW
KLLC01818
PASSAIC VALLEY SEWERAGE COMMISSIONERS
HARRISON AVENUE, HARRISON
SCHEMATIC
ELSON T. KILLAM ASSOCIATES, INC.

PLATE C



LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVCC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SPHON AND SPHON CHAMBER
- DELINEATION OF SUB AREA
- HARRISON AVENUE OVERFLOW CHAMBER
- HARRISON AVENUE COLLECTION SYSTEM

N

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

HARRISON AVENUE, HARRISON

PLAN OF COLLECTION SYSTE

ELTON T. HILLAN ASSOCIATES, INC
Environmental and Hydraulic Engineers

PLATE 1

KLLC01619

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

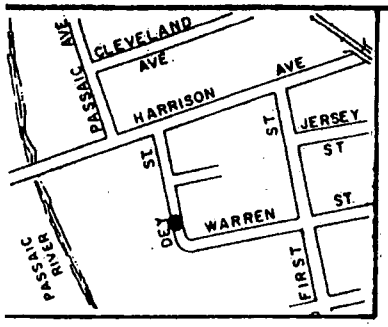
PASSAIC RIVER OVERFLOWS

DEY STREET, HARRISON
H-004

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers
[illegible] ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001820



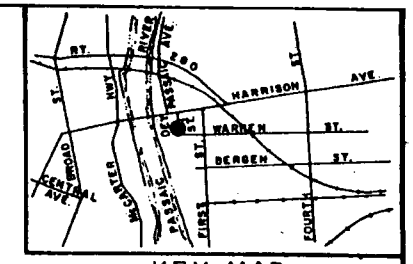
LOCATION PLAN

SCALE IN FEET

NOTE
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

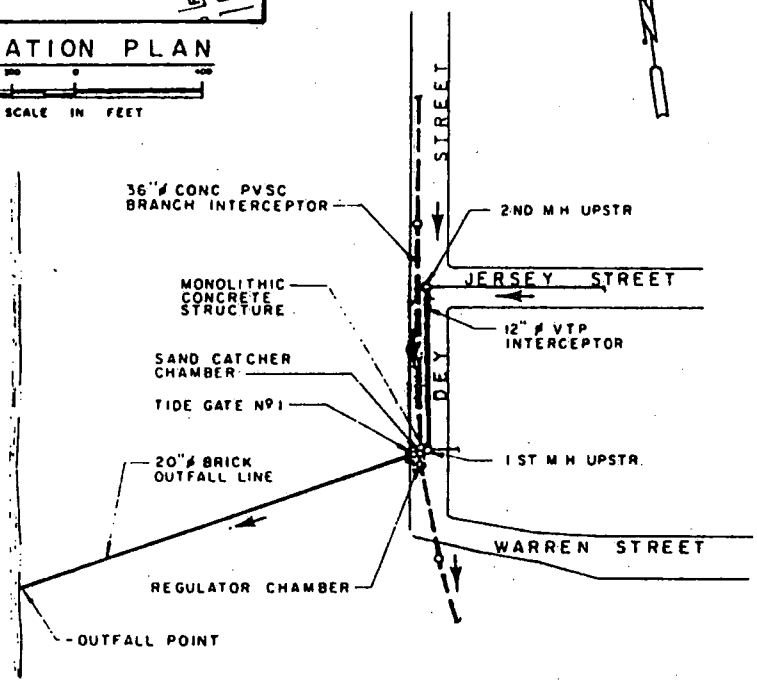
LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UPSTREAM
DN. STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



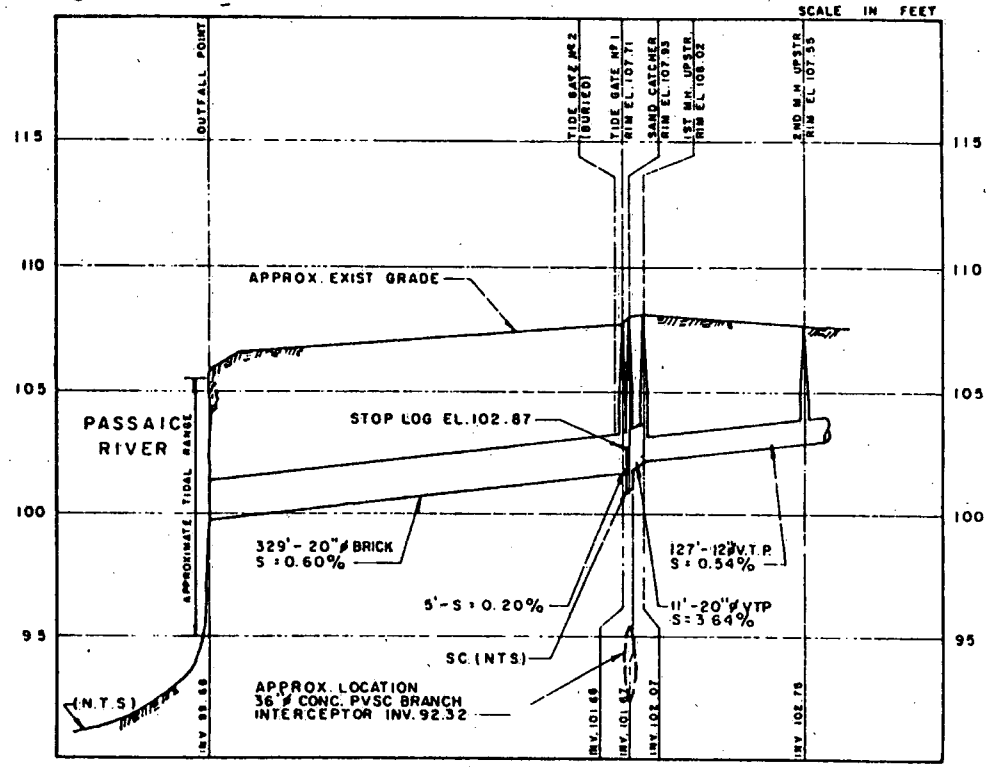
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. Nº 1864 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER H-004

DEY STREET, HARRISON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE 4

KLL001821

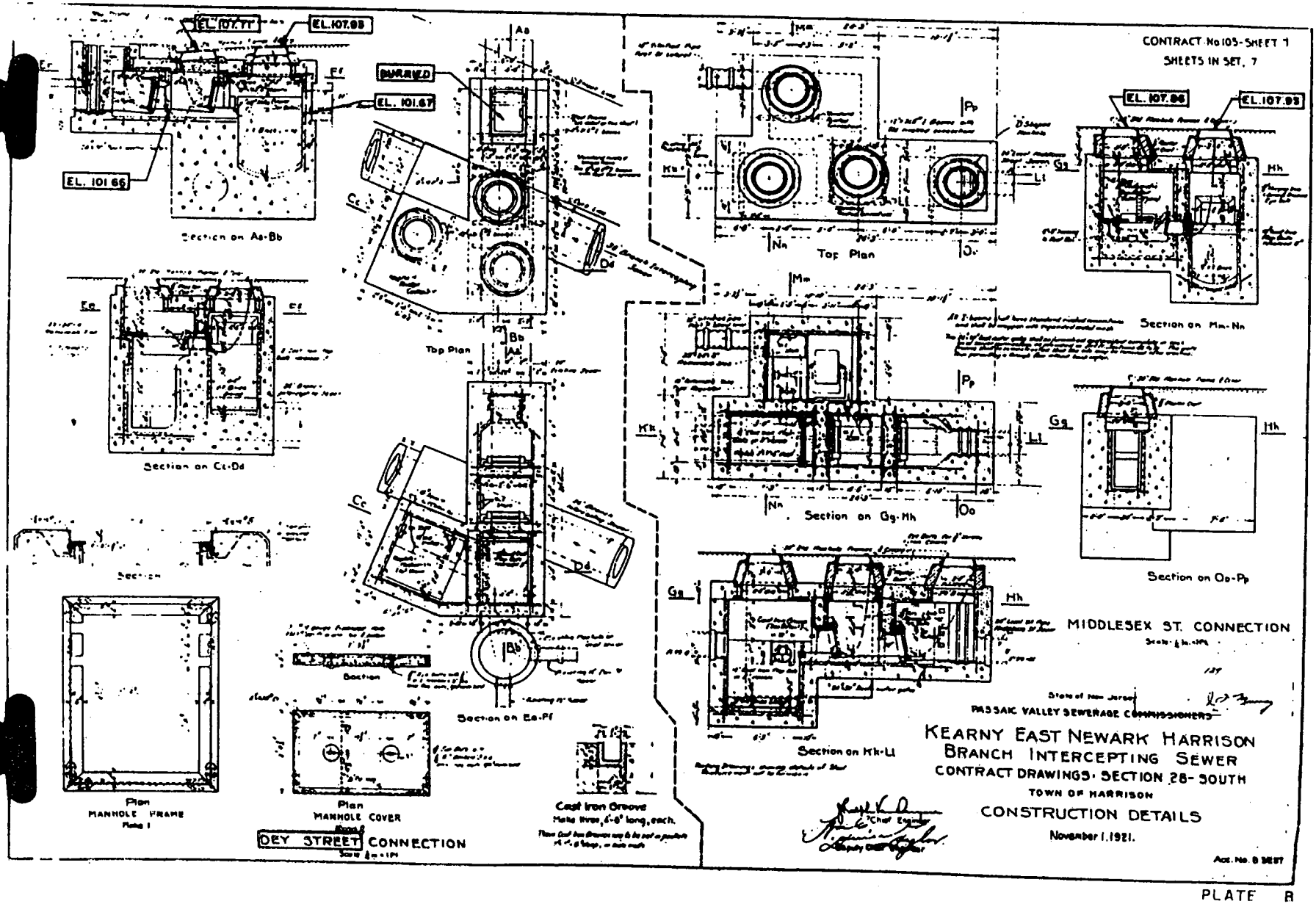


PLATE B

KLL001

(3)

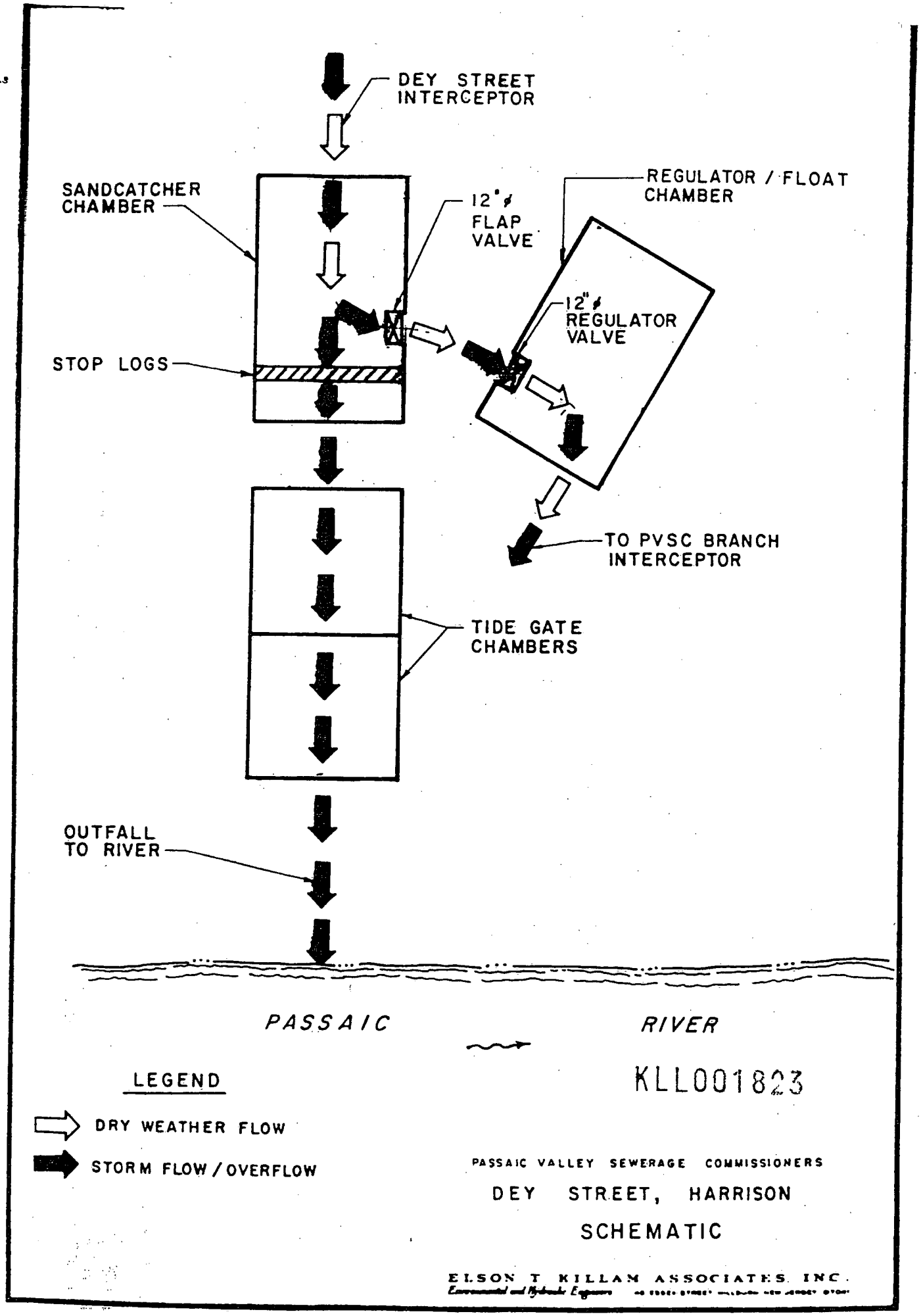
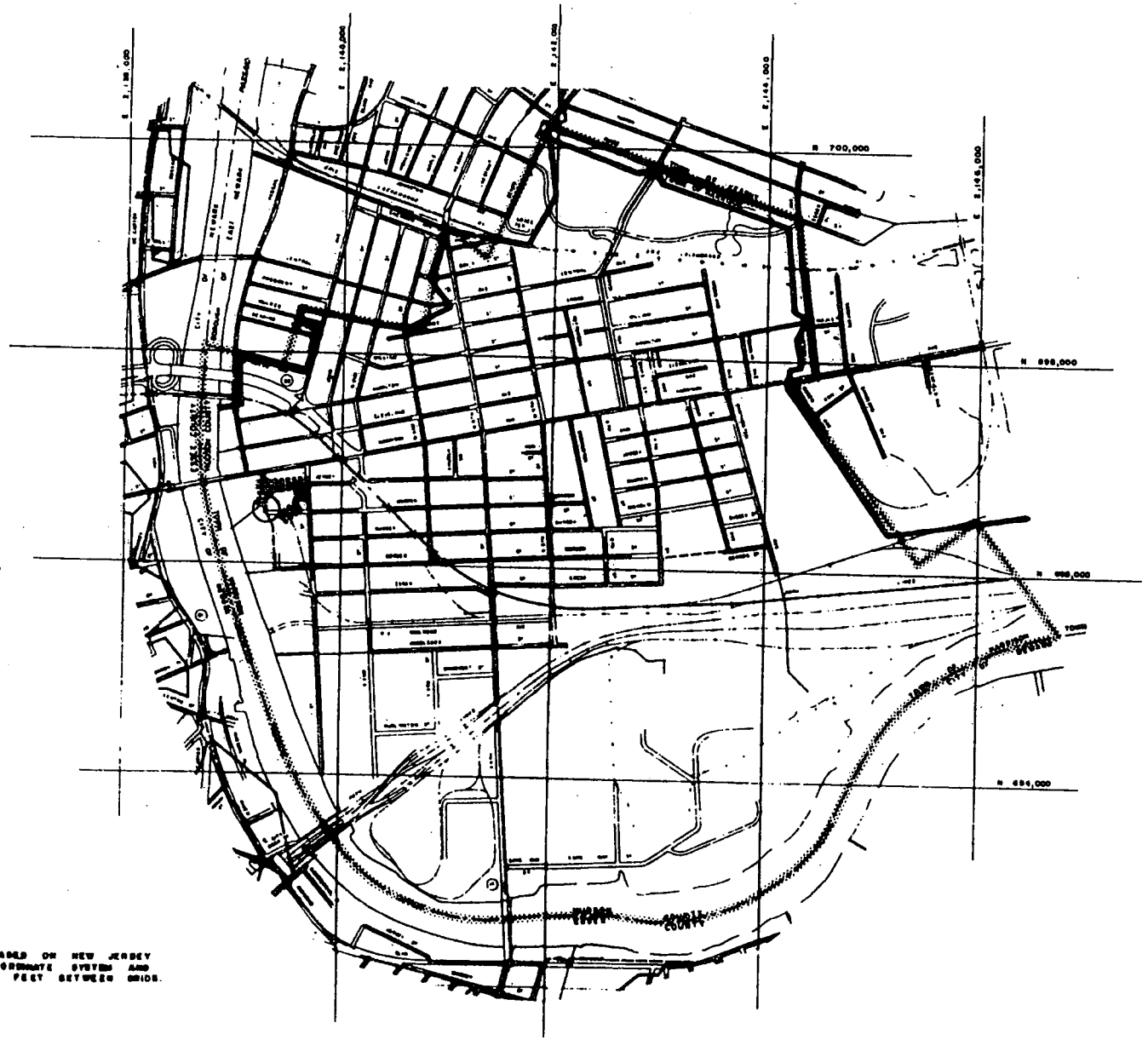

DEY STREET INTERCEPTOR
SANDCATCHER CHAMBER
12"ø FLAP VALVE
REGULATOR / FLOAT CHAMBER
12"ø REGULATOR VALVE
STOP LOGS
TO PVSC BRANCH INTERCEPTOR
TIDE GATE CHAMBERS
OUTFALL TO RIVER
PASSAIC RIVER
LEGEND
DRY WEATHER FLOW
STORM FLOW / OVERFLOW
KLL001823
PASSAIC VALLEY SEWERAGE COMMISSIONERS
DEY STREET, HARRISON
SCHEMATIC
ELSON T. KILLAM ASSOCIATES, INC.

PLATE C



KEY

MUNICIPAL BOUNDARY
COUNTY BOUNDARY
MANHOLE
TERMINAL MANHOLE
PVSC TRUNK SEWER
LOCAL SEWER
FORCE MAIN
PUMPING STATION
SIPHON AND SIPHON CHAMBER
DELINEATION OF SUB AREA
DEY STREET OVERFLOW CHAMBER
DEY STREET COLLECTION SYSTEM

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN - 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

DEY STREET, HARRISON

PLAN OF COLLECTION SYSTE

ELSON T. KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

PLATE 1

KLL001824

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

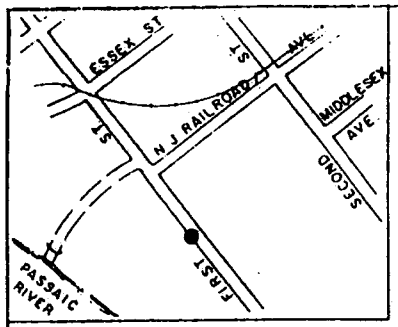
PASSAIC RIVER OVERFLOWS

MIDDLESEX STREET, HARRISON
H-005

1976

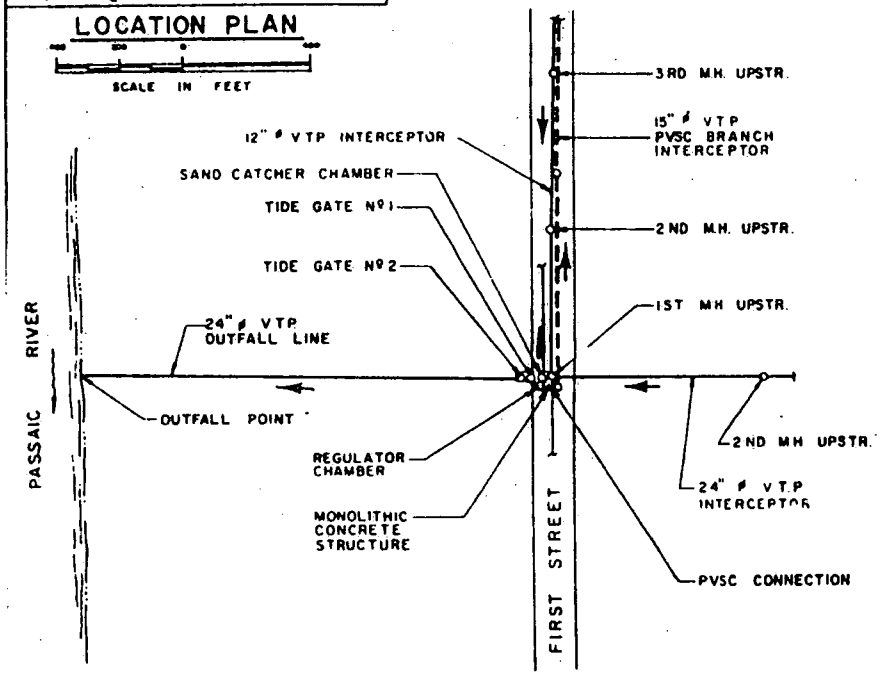
ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001825



LOCATION PLAN

SCALE IN FEET



PLAN

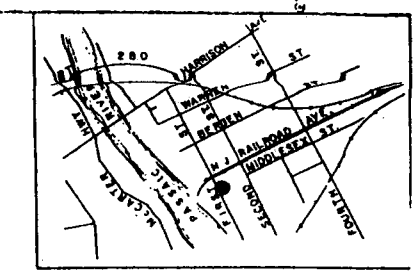
SCALE IN FEET

NOTE

ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

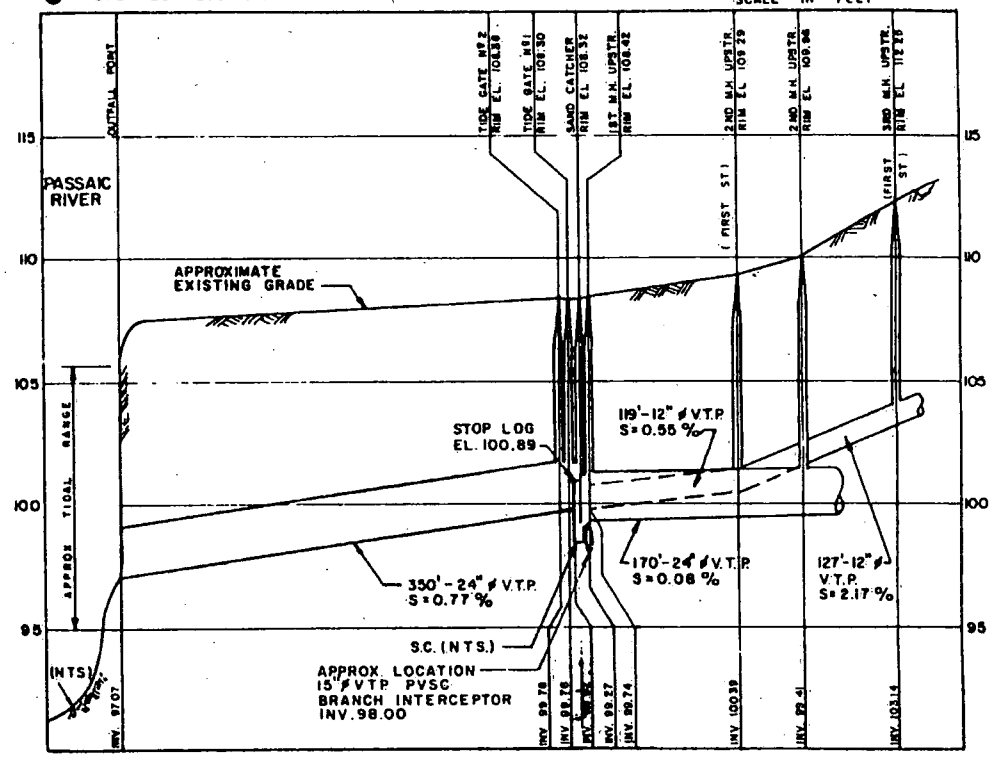
LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UPSTREAM
DN STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
V.T.P = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



KEY MAP

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. Nº1204 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER H-005

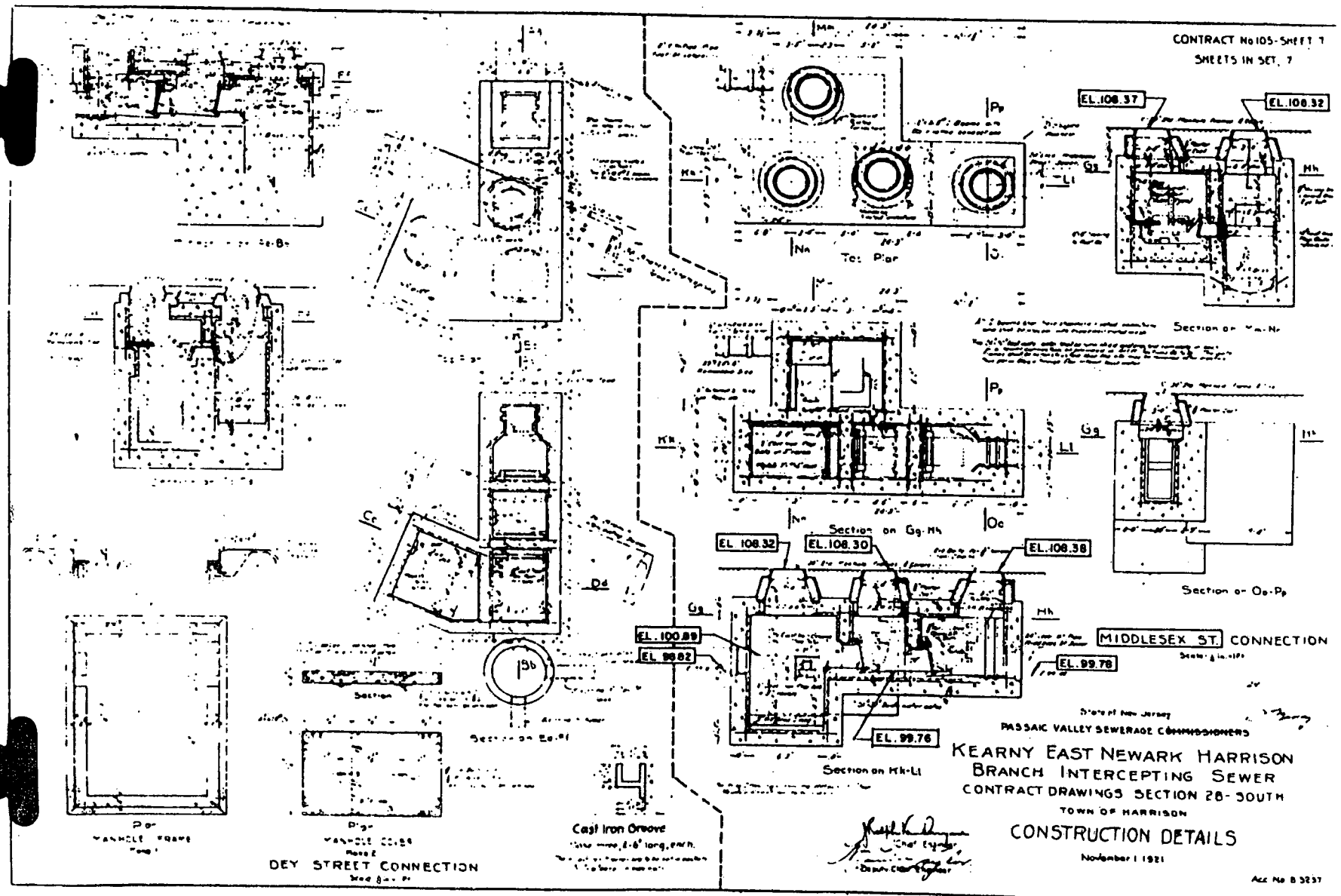
MIDDLESEX STREET, HARRISON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.

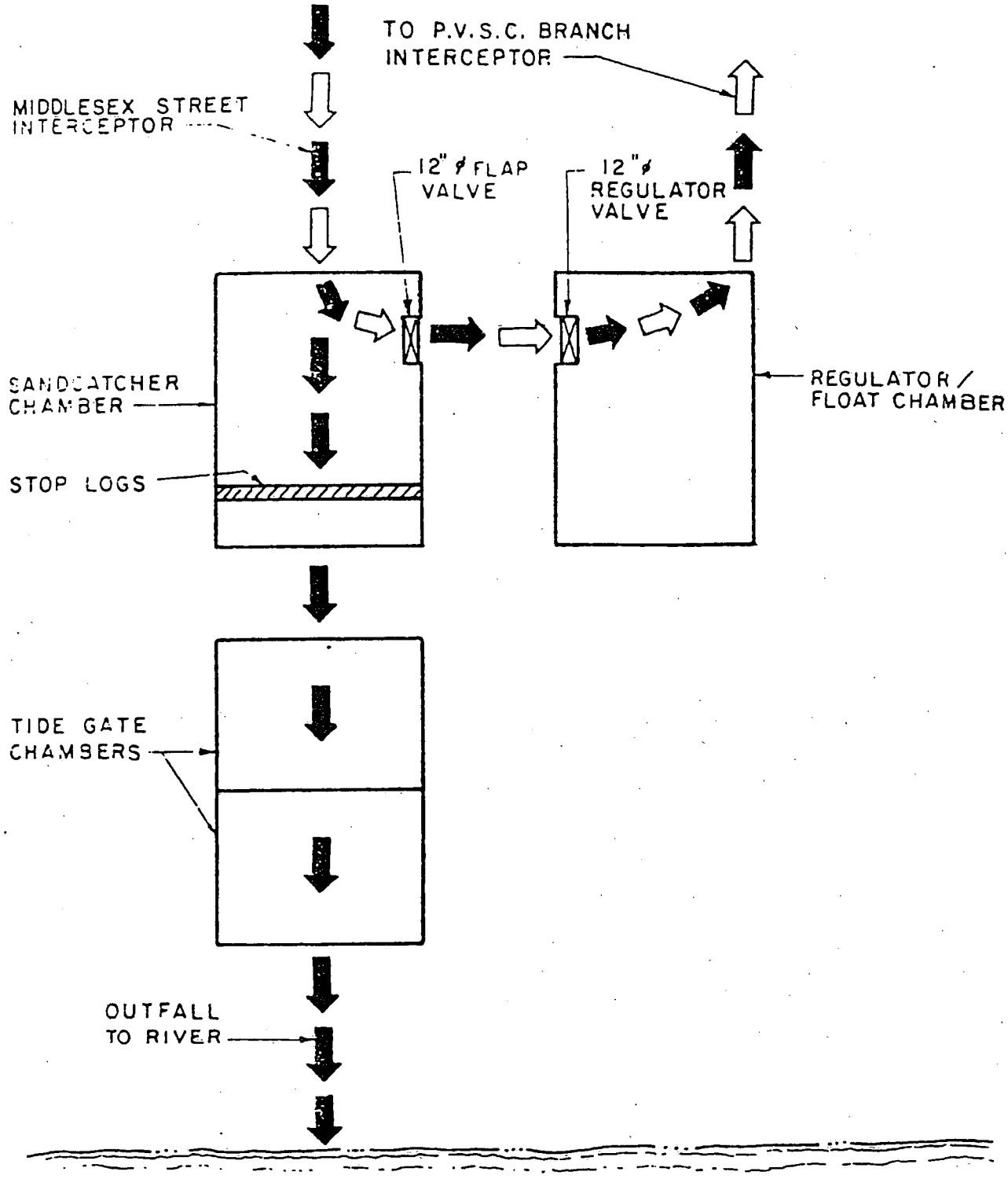
PLATE

KLL001826


CONTRACT No 105-SHEET 7
SHEETS IN SET, 7
EL. 108.37
EL. 108.32
Top Plan
Section on Mm-Nn
Section on Gg-Hh
Section on Oo-Pp
EL. 108.32
EL. 108.30
EL. 108.38
EL. 100.89
EL. 98.82
EL. 99.78
EL. 99.76
Section on Kk-Ll
MIDDLESEX ST. CONNECTION
State of New Jersey
PASSAIC VALLEY SEWERAGE COMMISSIONERS
KEARNY EAST NEWARK HARRISON
BRANCH INTERCEPTING SEWER
CONTRACT DRAWINGS SECTION 28-SOUTH
TOWN OF HARRISON
CONSTRUCTION DETAILS
November 1 1921
Acc No B 5237
Cast Iron Groove
DEY STREET CONNECTION
Section
Section on Ee-Ff
Plan
MANHOLE FRAME
Plan
MANHOLE COVER

KLL001827

(3)



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001828

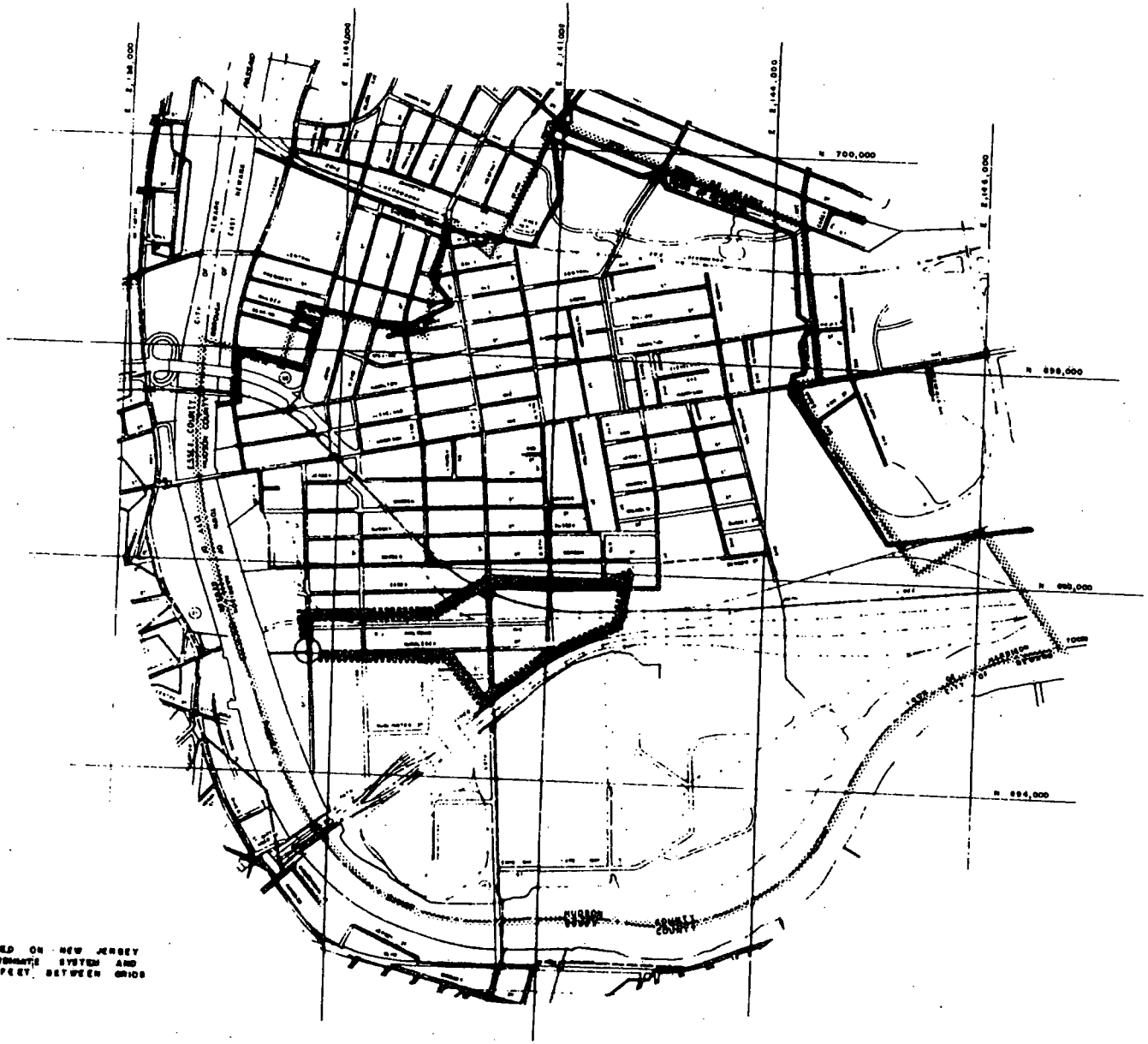
PASSAIC VALLEY SEWERAGE COMMISSIONERS

MIDDLESEX STREET, HARRISON

SCHEMATIC

LESON E. KELLAM ASSOCIATES, INC.

PLATE C



MUNICIPAL BOUNDARY
COUNTY BOUNDARY
MANHOLE
TERMINAL MANHOLE
PVSC TRUNK SEWER
LOCAL SEWER
FORCE MAIN
PUMPING STATION
SIPHON AND SIPHON CHAMBER
DELINEATION OF SUB AREA
MIDDLESEX STREET OVERFLOW CHAMBER
MIDDLESEX STREET COLLECTION SYSTEM

N

SCALE IN FEET

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 5000 FEET BETWEEN GRIDS

PASSAIC VALLEY SEWERAGE COMMISSIONERS

MIDDLESEX STREET, HARRISO

PLAN OF COLLECTION SYSTE

ELSON T. KILLAM ASSOCIATES INC

Environmental and Hydraulic Engineers

PLATE D

KLL001829

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

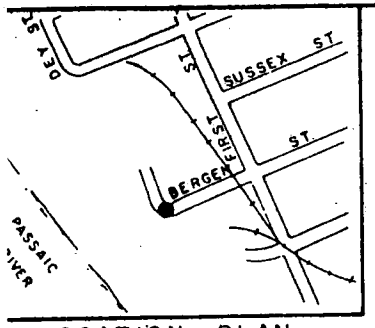
PASSAIC RIVER OVERFLOWS

BERGEN STREET, HARRISON
H-006

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001830



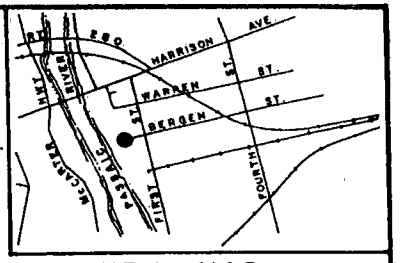
LOCATION PLAN

SCALE IN FEET

NOTE
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

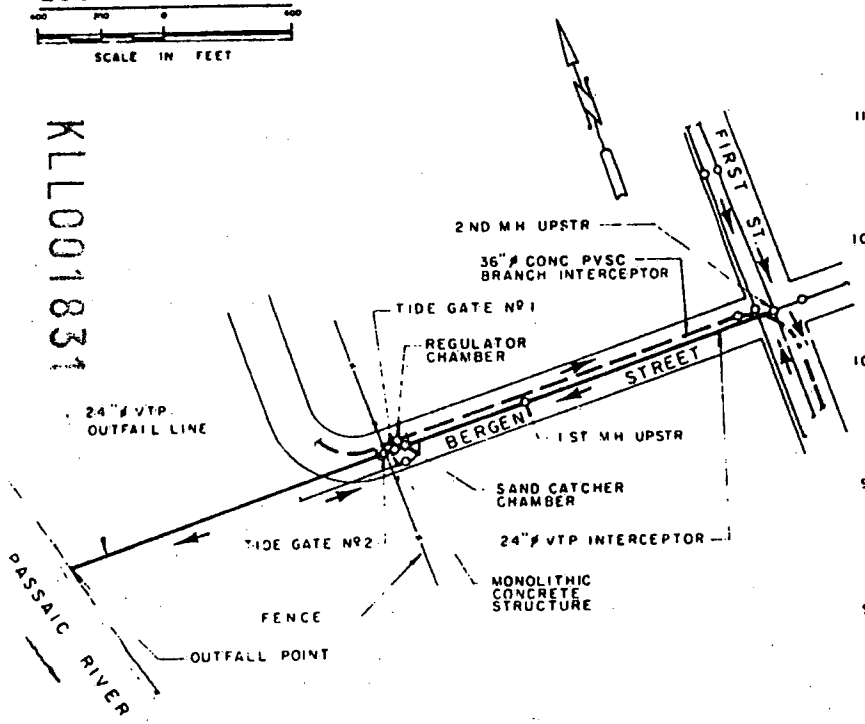
LEGEND

- DIRECTION OF FLOW
- S.C. = SAND CATCHER
- T.G. = TIDE GATE
- UP STR. = UPSTREAM
- DN STR. = DOWNSTREAM
- N.T.S. = NOT TO SCALE
- V T P = VITRIFIED TILE PIPE
- ● = OVERFLOW LOCATION



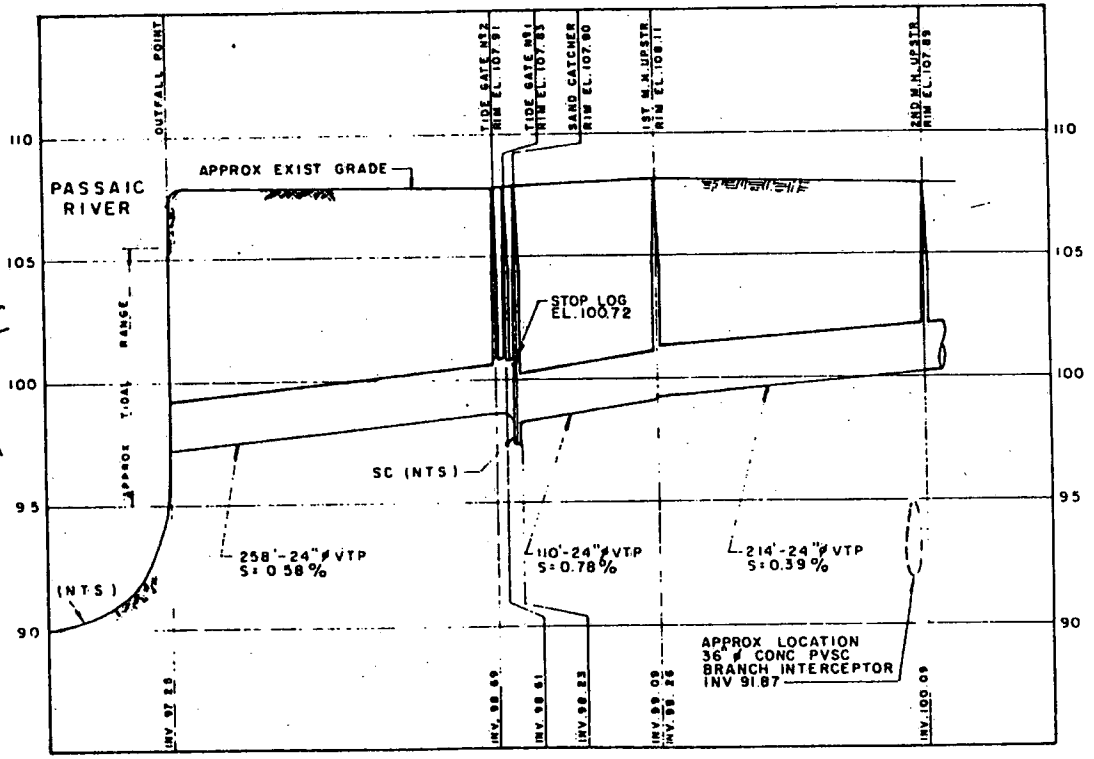
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON I.M. Nº 264 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER H-006

BERGEN STREET, HARRISON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.

PLATE A

KLL001831

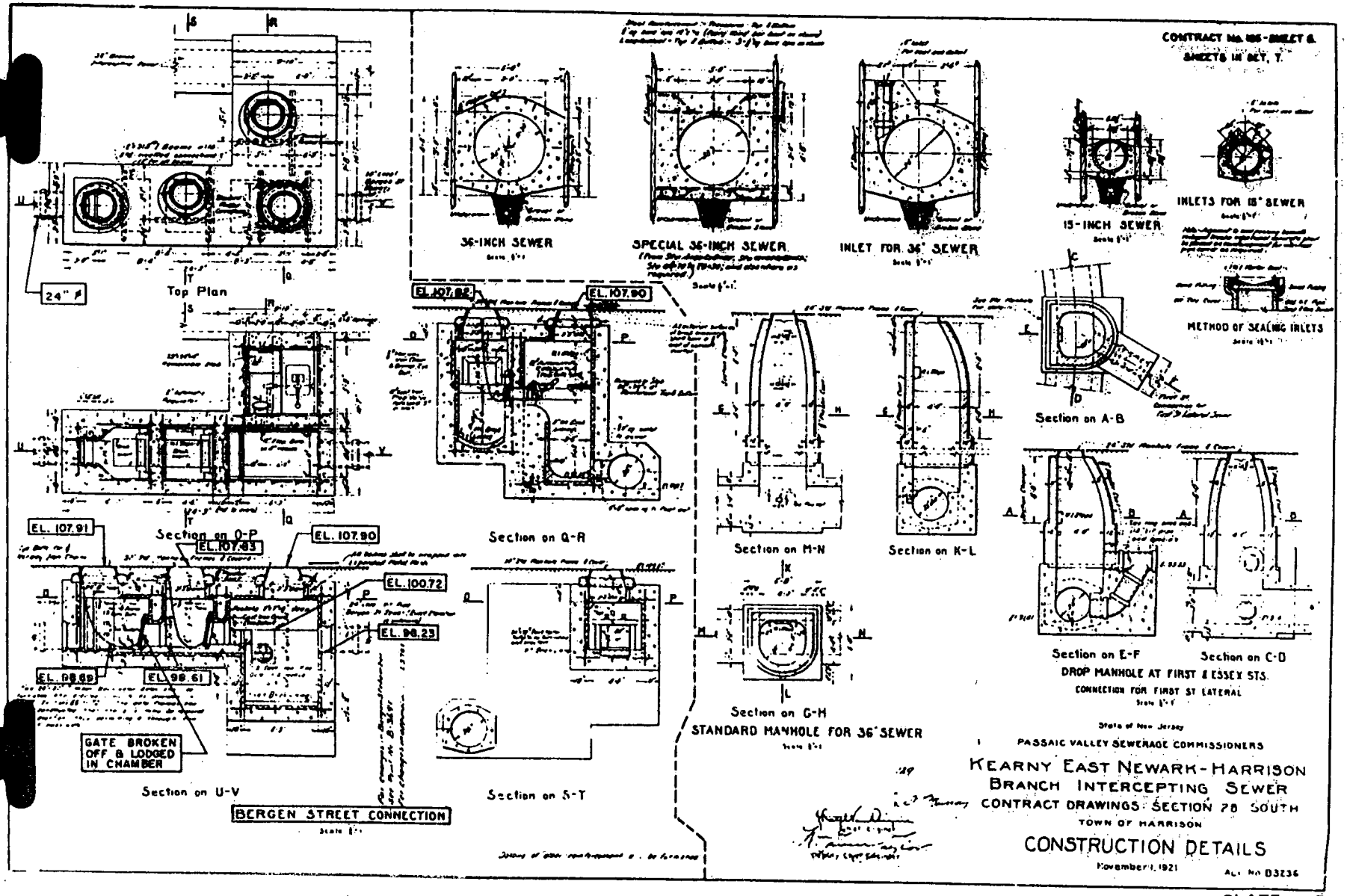
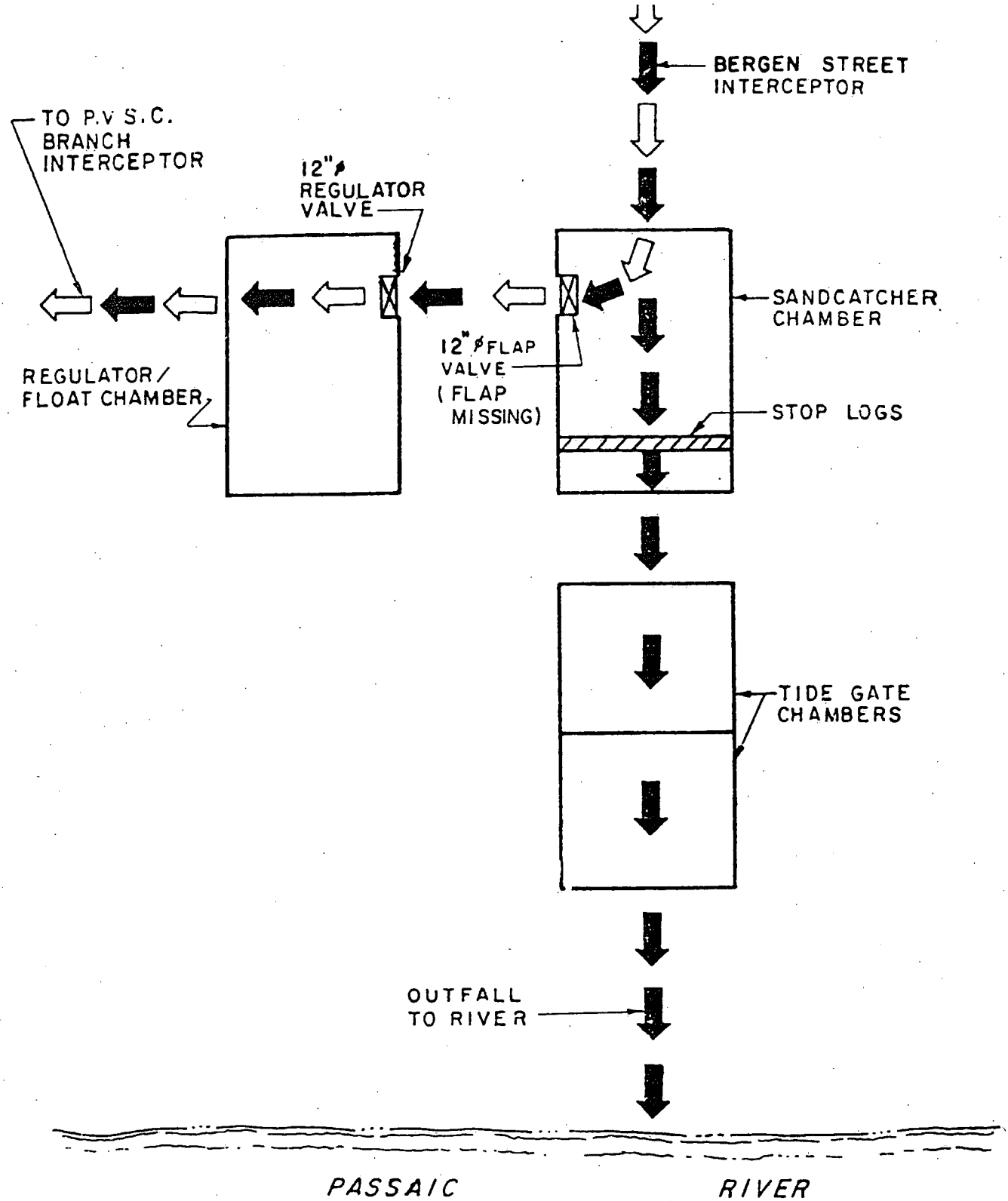


PLATE B

(3)

KLL001832



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001833

PASSAIC VALLEY SEWERAGE COMMISSIONERS

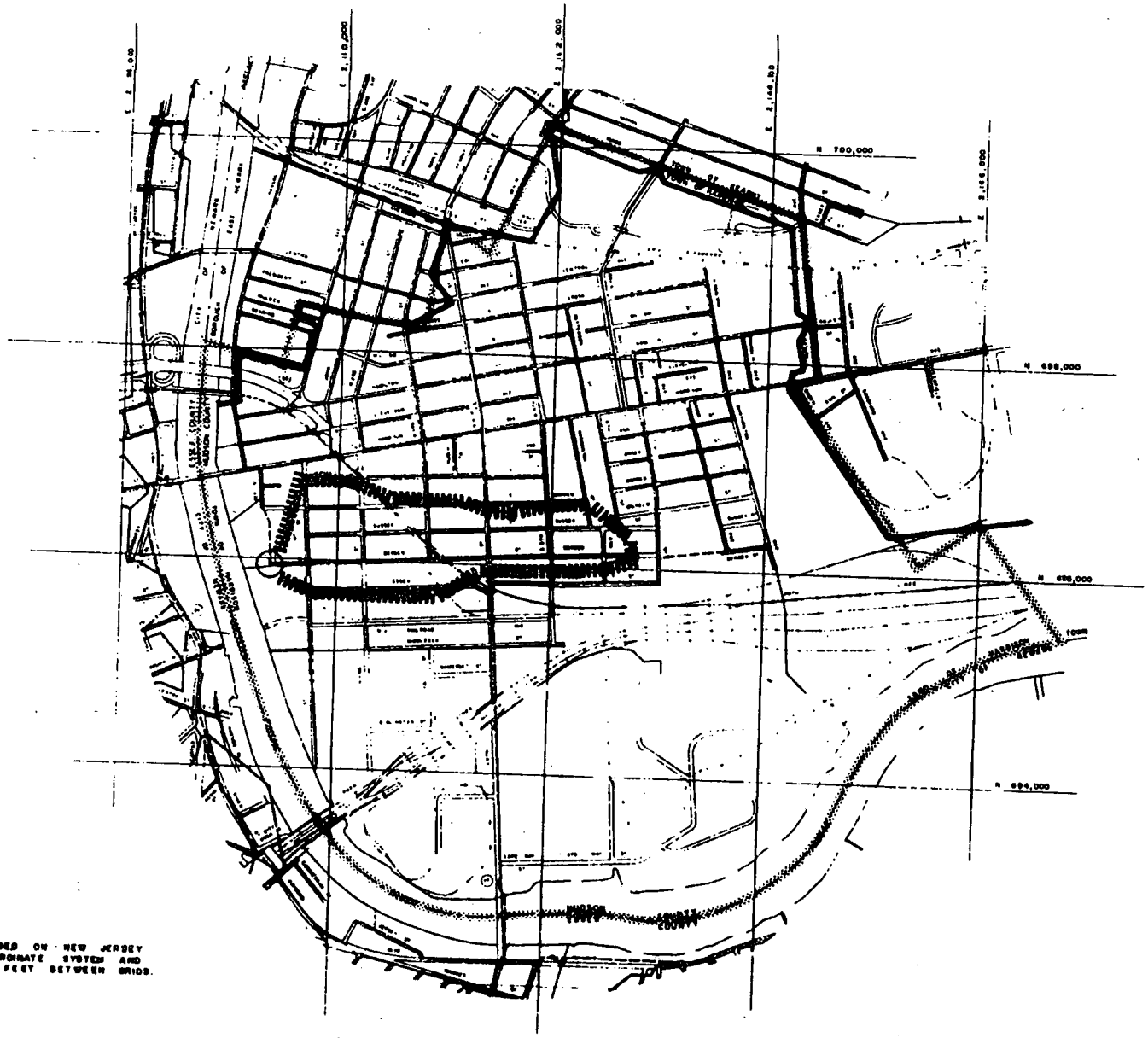
BERGEN STREET, HARRISON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE C



LEGEND

- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- BERGEN STREET OVERFLOW CHAMBER
- BERGEN STREET COLLECTION SYSTEM

N

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

BERGEN STREET, HARRISON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.
Consulting and Hydraulic Engineers

PLATE D

KLL001834

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

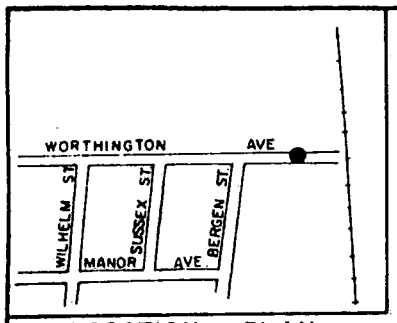
PASSAIC RIVER OVERFLOWS

WORTHINGTON AVENUE, HARRISON
H-007

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers
48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001835



LOCATION PLAN

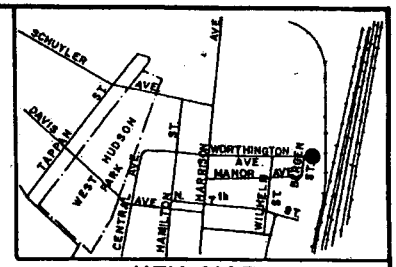
SCALE IN FEET

NOTES

1. ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.
2. REGULATOR IS LOCATED AT WORTHINGTON AVENUE AND HARRISON AVENUE (SEE KEY MAP)

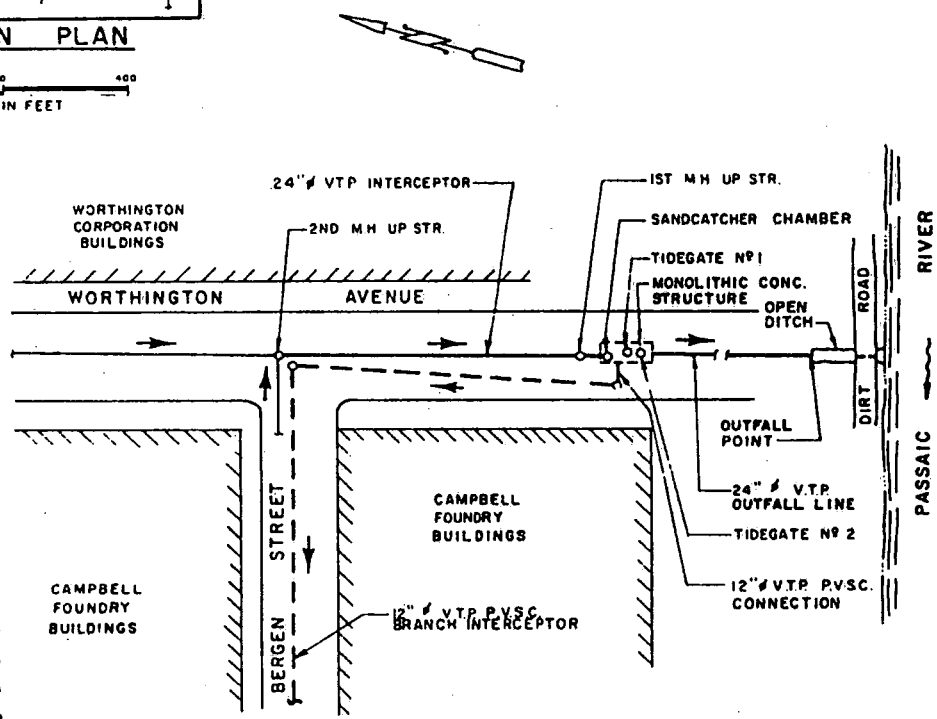
LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UPSTREAM
DN. STR. = DOWNSTREAM
N.T.S. = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



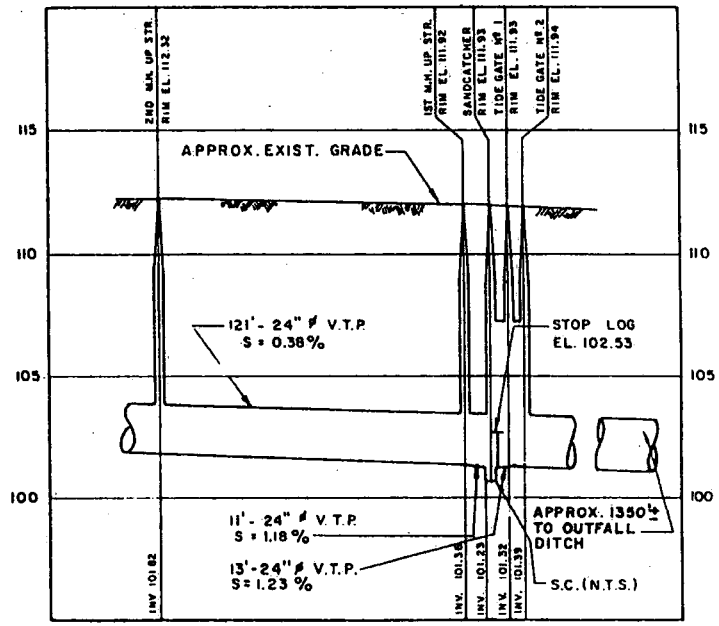
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. Nº 1287 AS ESTABLISHED BY PAUL J. EMILIUS & ASSOCIATES FOR LOCATION AND DESCRIPTION SEE APPENDIX

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER H-007

WORTHINGTON AVENUE, HARRISON

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

KLL001836

PLATE

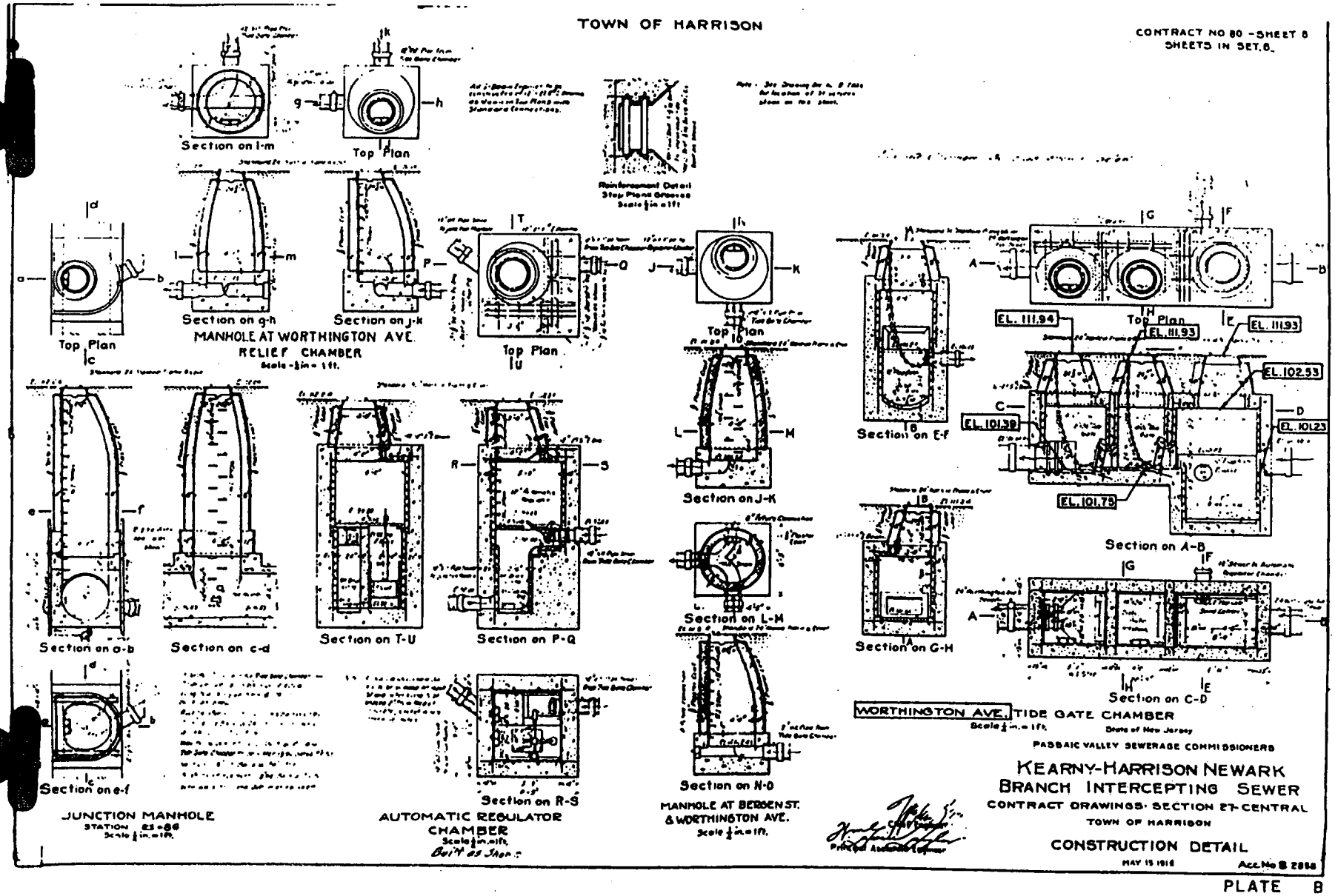
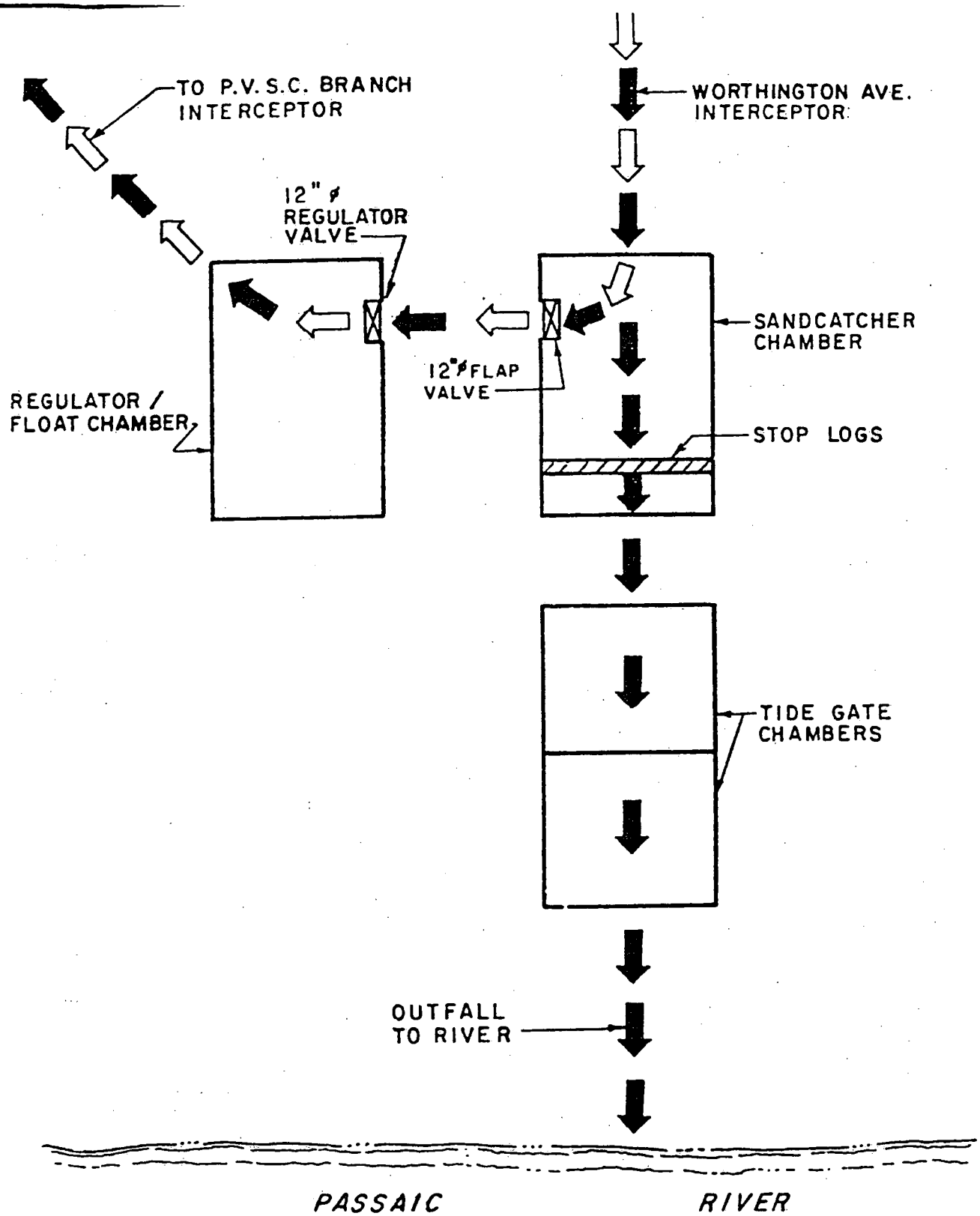


PLATE B

KLL001837



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001838

PASSAIC VALLEY SEWERAGE COMMISSIONERS

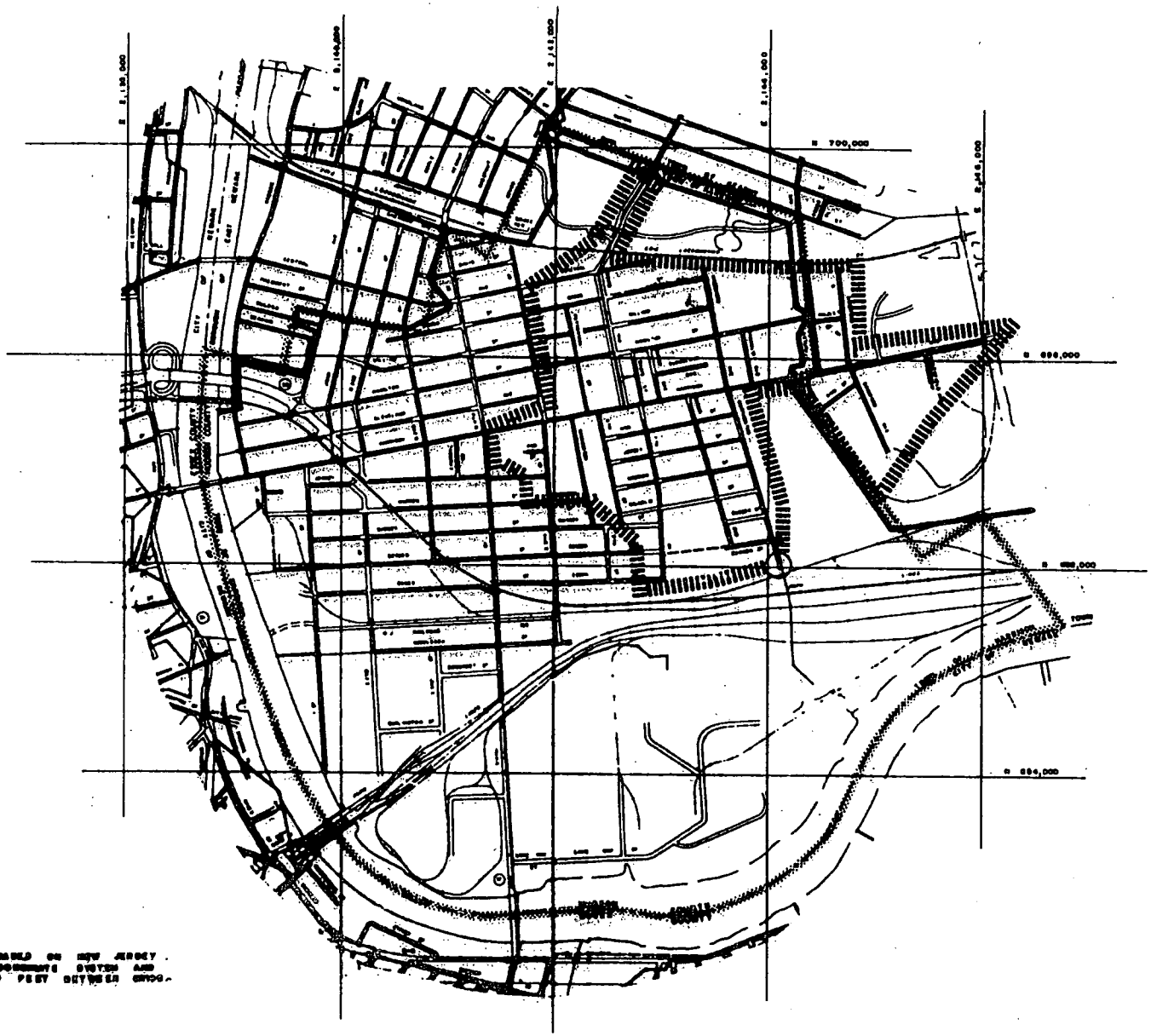
WORTHINGTON AVENUE, HARRISON

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE C



LEGEND

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- WORTHINGTON AVENUE OVERFLOW CHAMBER
- WORTHINGTON AVENUE COLLECTION SYSTEM

N

SCALE IN FEET

NOTE

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS SHOWN 5000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

WORTHINGTON AVENUE, HARRISON

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE D

KLL001639

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

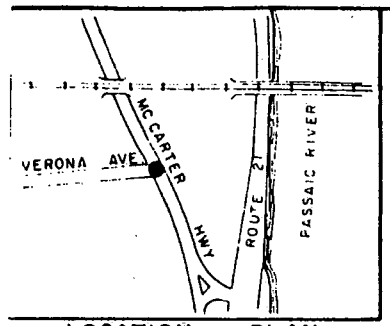
PASSAIC RIVER OVERFLOWS

VERONA AVENUE, NEWARK
N-001

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

KLL001840



LOCATION PLAN

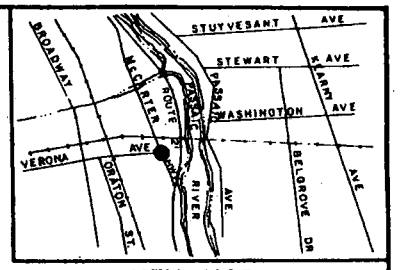
400 200 0 400
SCALE IN FEET

NOTE:

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

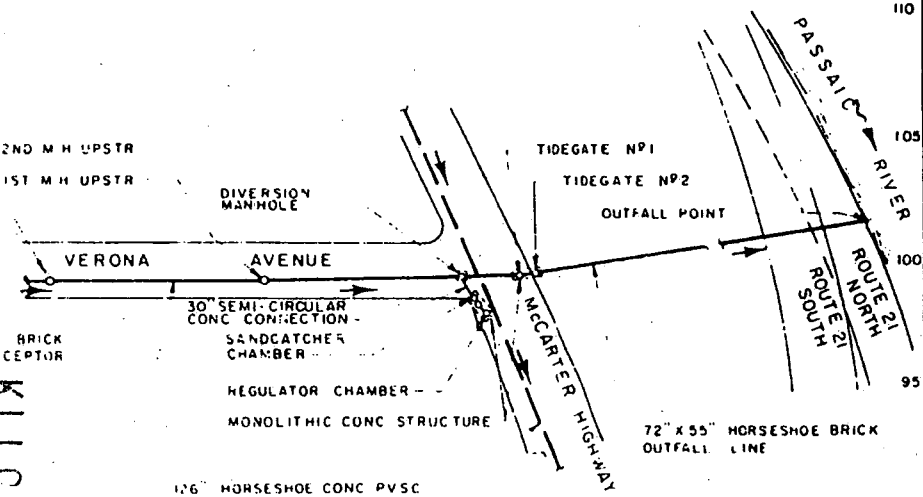
LEGEND

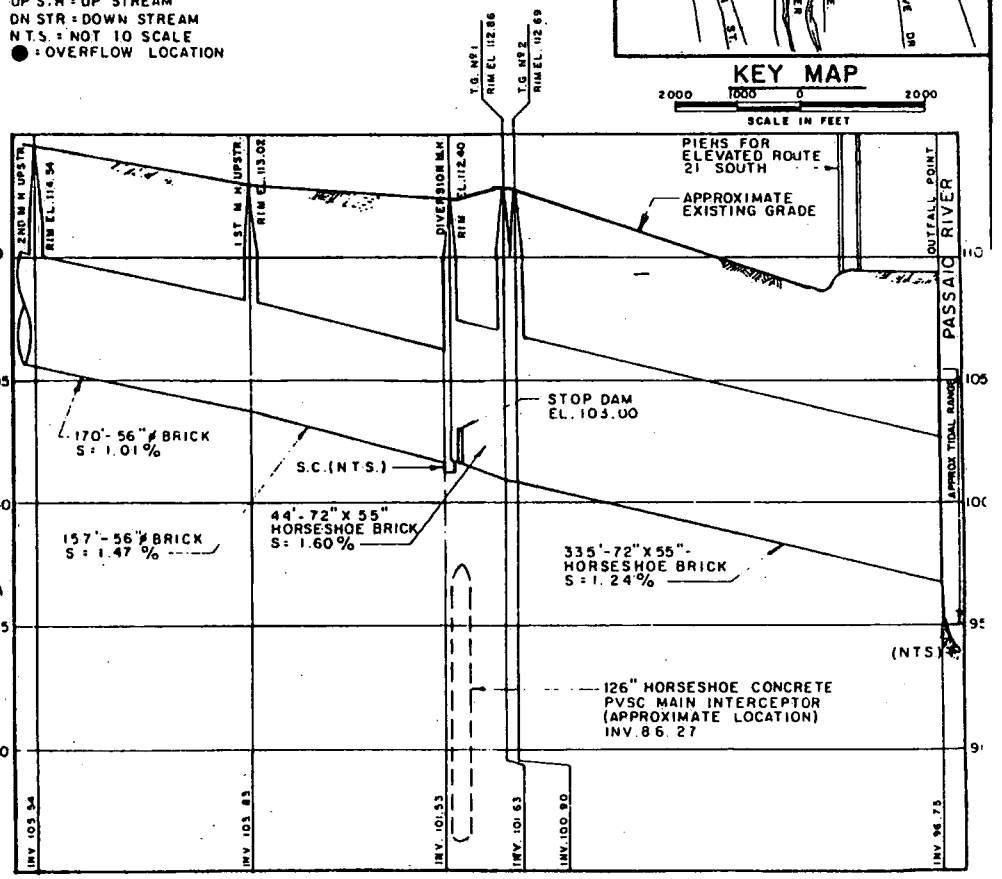
→ DIRECTION OF FLOW
S.C = SAND CATCHER
T G = TIDE GATE
UP STR = UP STREAM
DN STR = DOWN STREAM
N.T.S. = NOT TO SCALE
● = OVERFLOW LOCATION



KEY MAP

2000 1000 0 2000
SCALE IN FEET





PLAN

0 50 0 100
SCALE IN FEET

PROFILE

HORIZONTAL 100 50 0 100
SCALE IN FEET

VERTICAL 5 4 3 2 1 0 5
SCALE IN FEET

ALL ELEVATIONS BASED ON P.M. Nº 1252 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER N-001

VERONA AVENUE, NEWARK

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC
Environmental and Hydraulic Engineers

KLLC01041

PLATE A

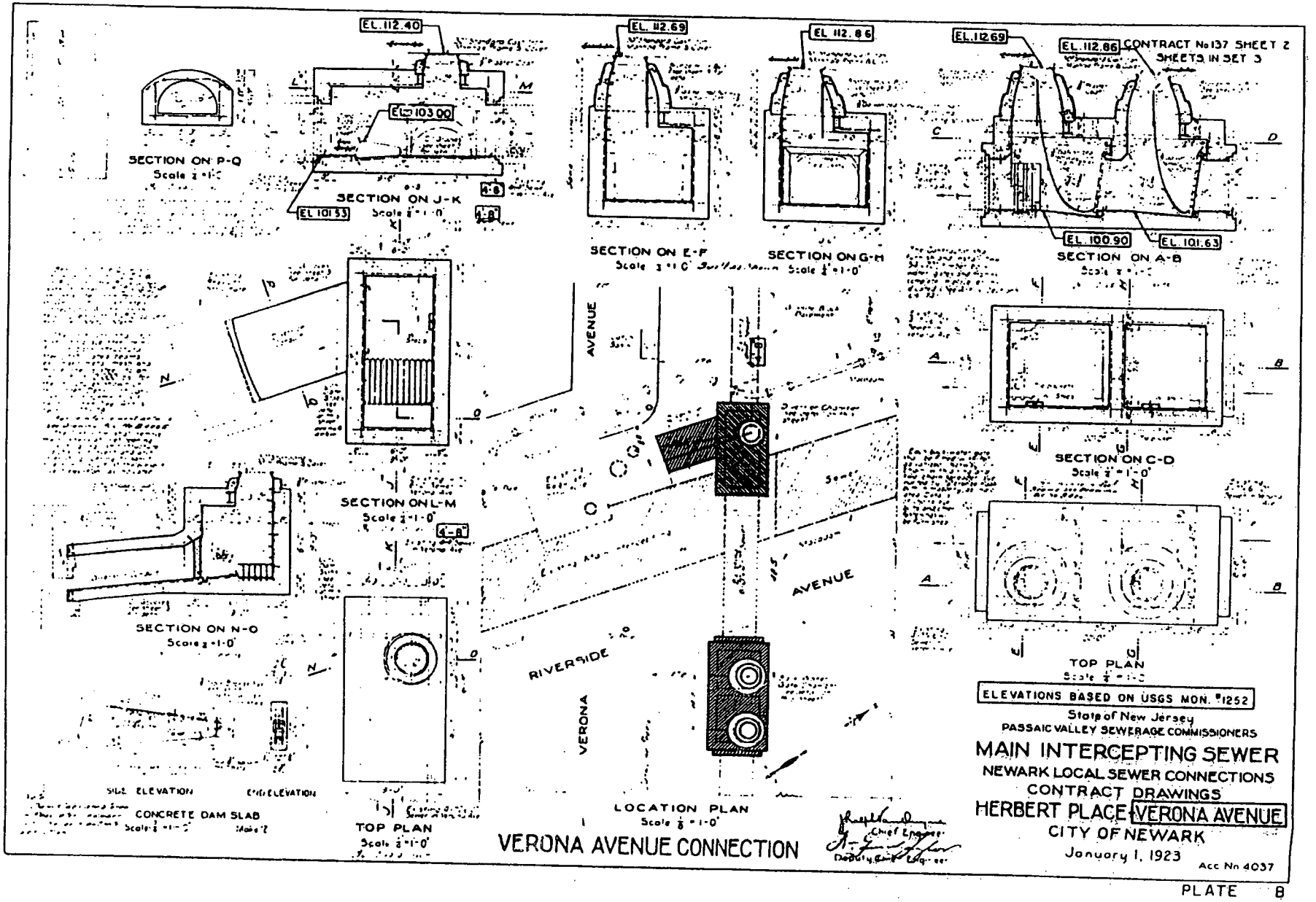
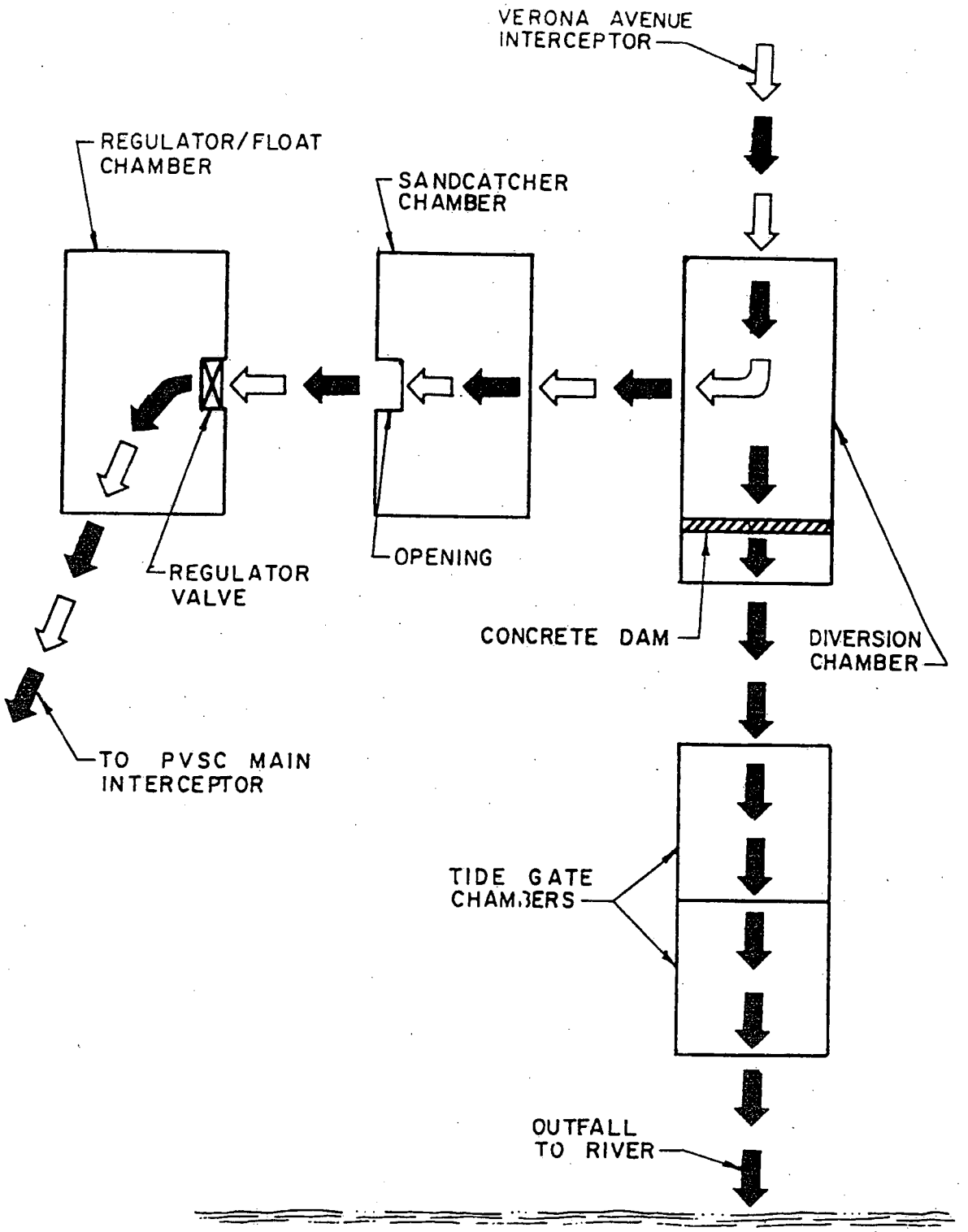


PLATE 8

(3)

KLL001842



LEGEND

DRY WEATHER FLOW

STORM FLOW / OVERFLOW

KLL001843

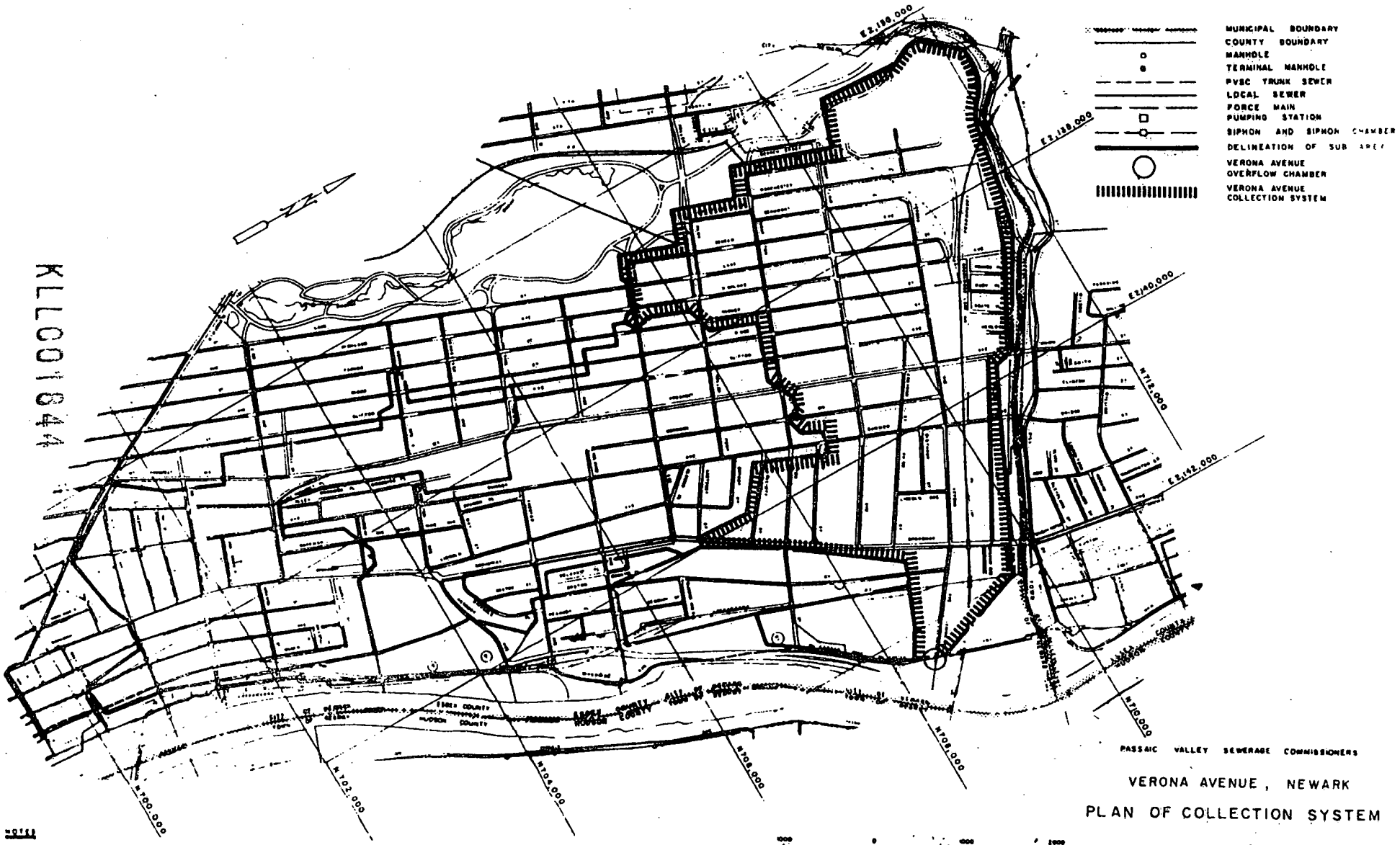
PASSAIC VALLEY SEWERAGE COMMISSIONERS

VERONA AVENUE, NEWARK

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

PLATE C



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

VERONA AVENUE, NEWARK

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE D

KLLC018044

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

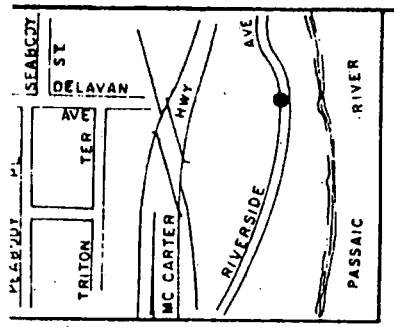
PASSAIC RIVER OVERFLOWS

DELAVAN AVENUE, NEWARK
N-002

1976

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

KLLC01845

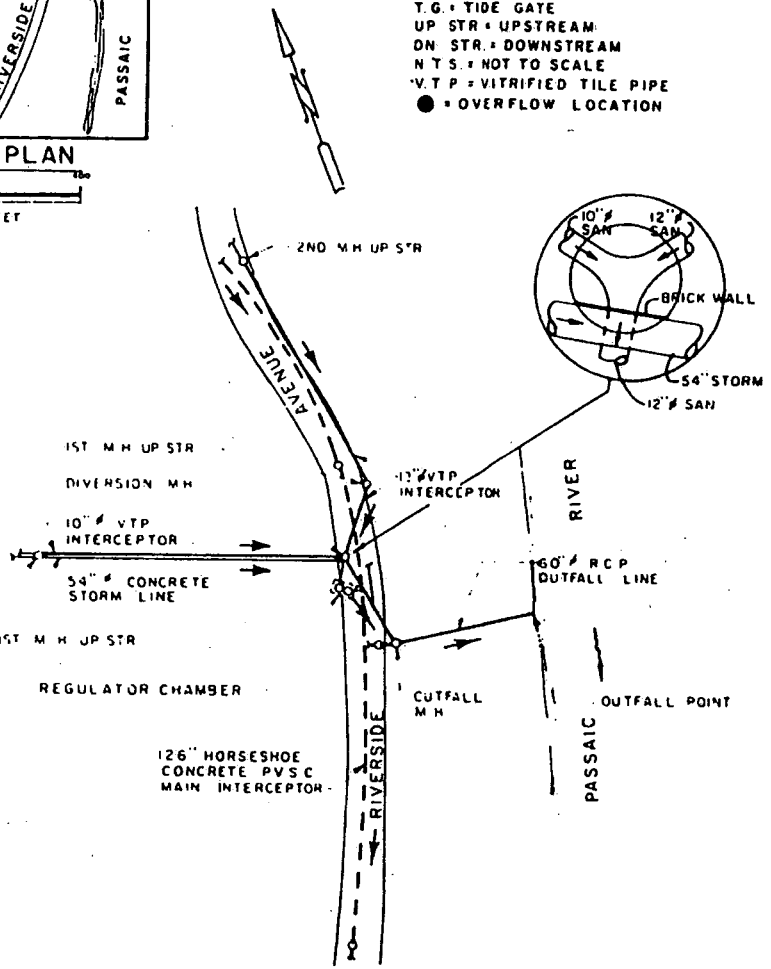


LOCATION PLAN

SCALE IN FEET

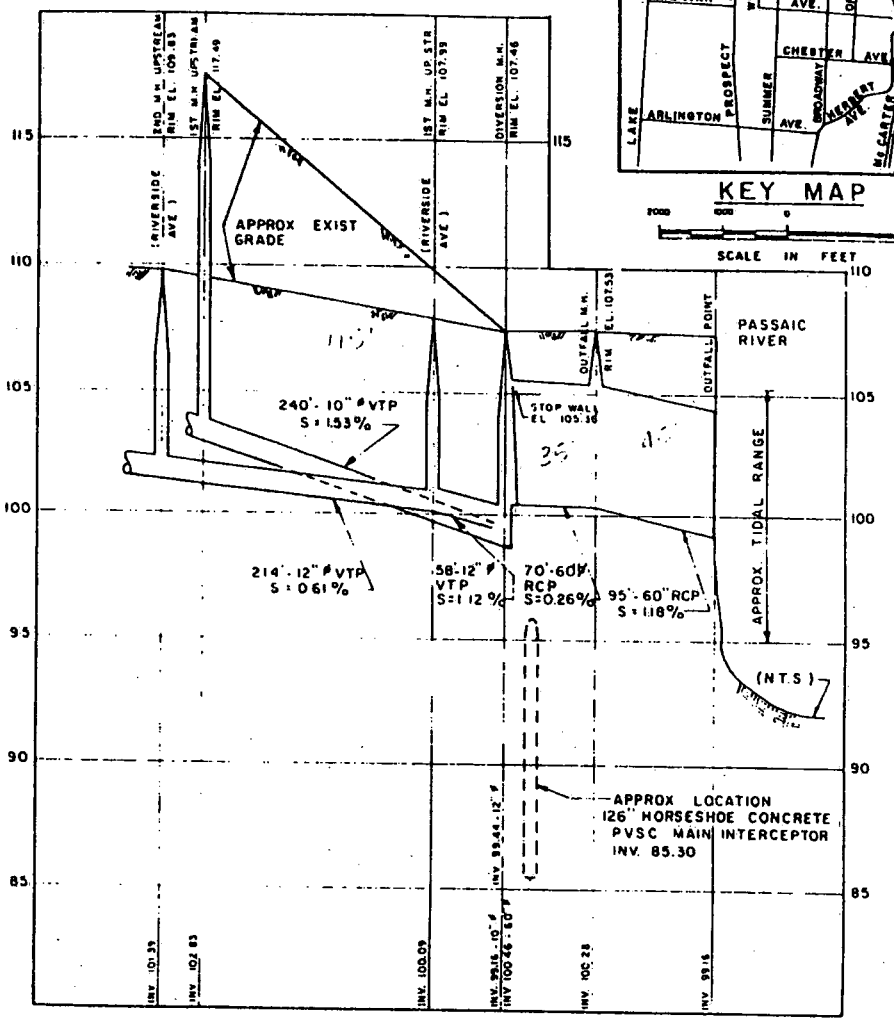
NOTE
ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

LEGEND
→ DIRECTION OF FLOW
S C = SAND CATCHER
T.G. = TIDE GATE
UP STR = UPSTREAM
DN STR. = DOWNSTREAM
N T S. = NOT TO SCALE
V.T P = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



PLAN

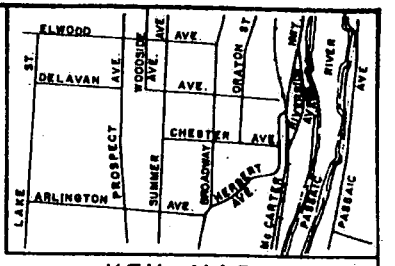
SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET



KEY MAP

SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. Nº 1832 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

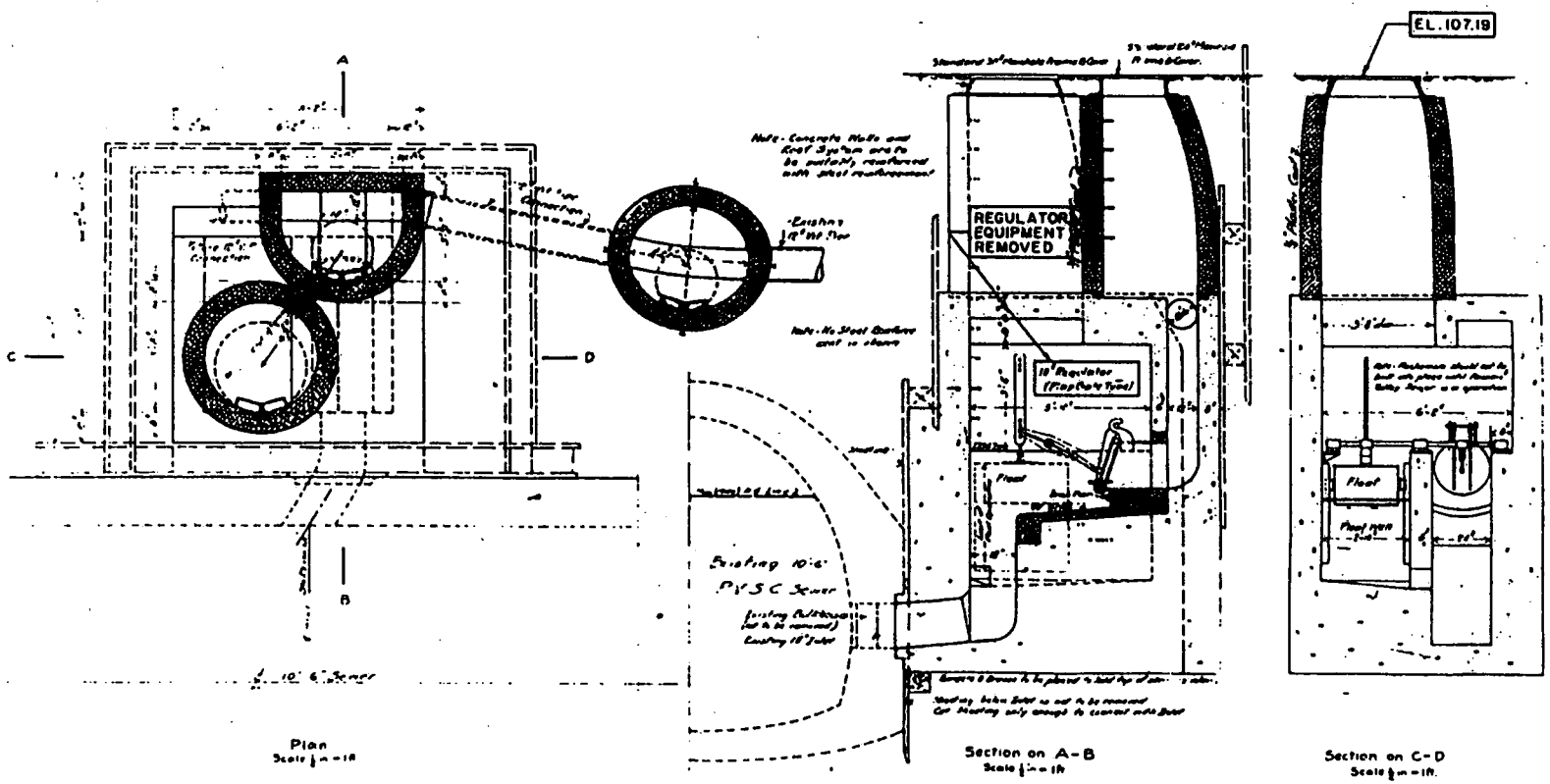
PASSAIC VALLEY SEWERAGE COMMISSIONERS
OVERFLOW CHAMBER N-002
DELAVAN AVENUE, NEWARK

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

PLATE A

KLL001846



Note. This structure was built as shown on this sheet but not as part of Contract 36.

ELEVATIONS BASED ON USGS MON. #1252

State of New Jersey

PASSAIC VALLEY SEWERAGE COMMISSIONERS

MAIN INTERCEPTING SEWER

~~SUGGESTED~~ REGULATING MANHOLE & CONNECTION

DELEVAN AVE. NEWARK - SECTION 8 (NORTH)

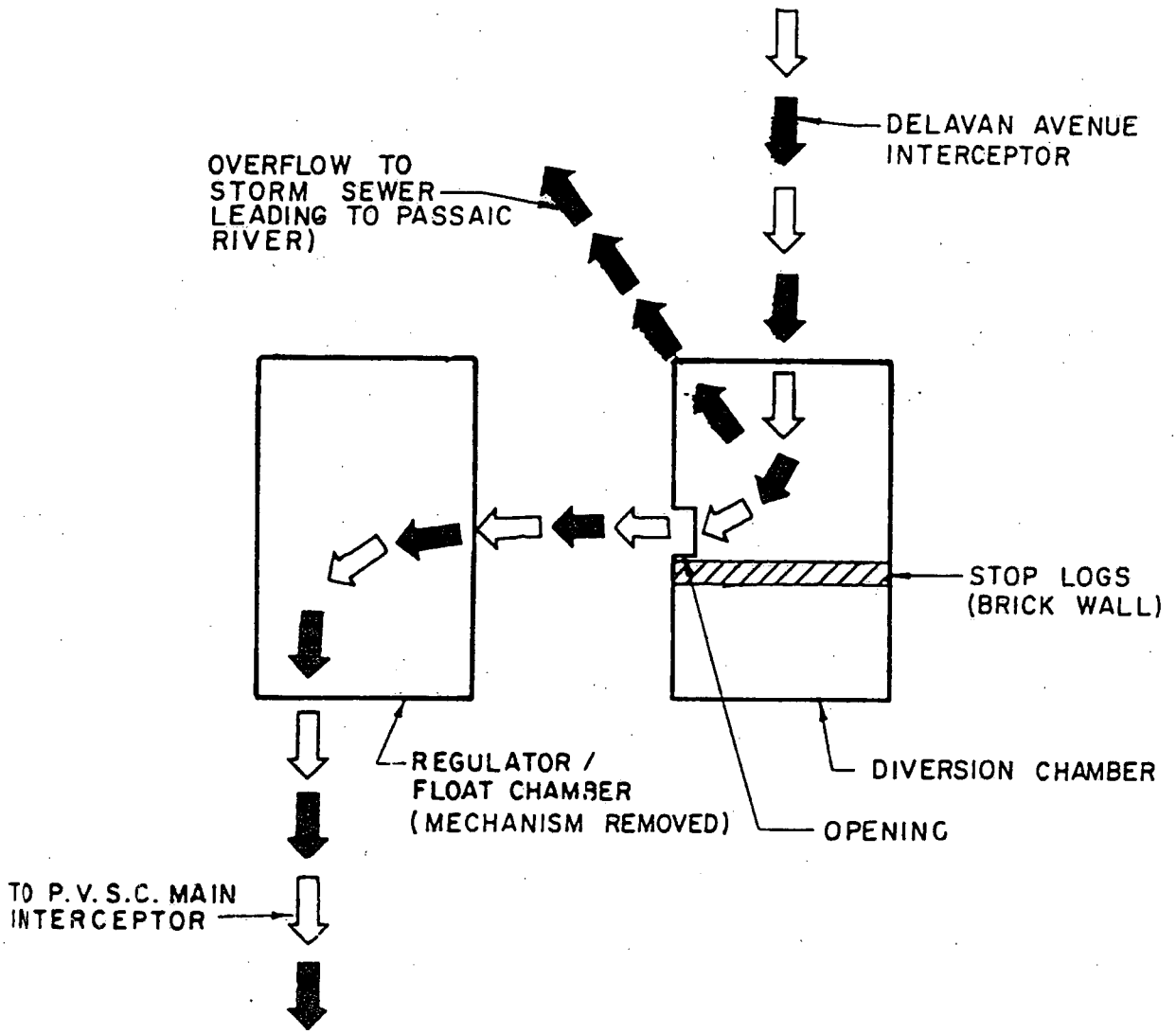
September 10, 1917

Ass. No. 82717

PLATE B

(3)

KLL001847



LEGEND

DRY WEATHER FLOW

STORM FLOW / OVERFLOW

KLL001848

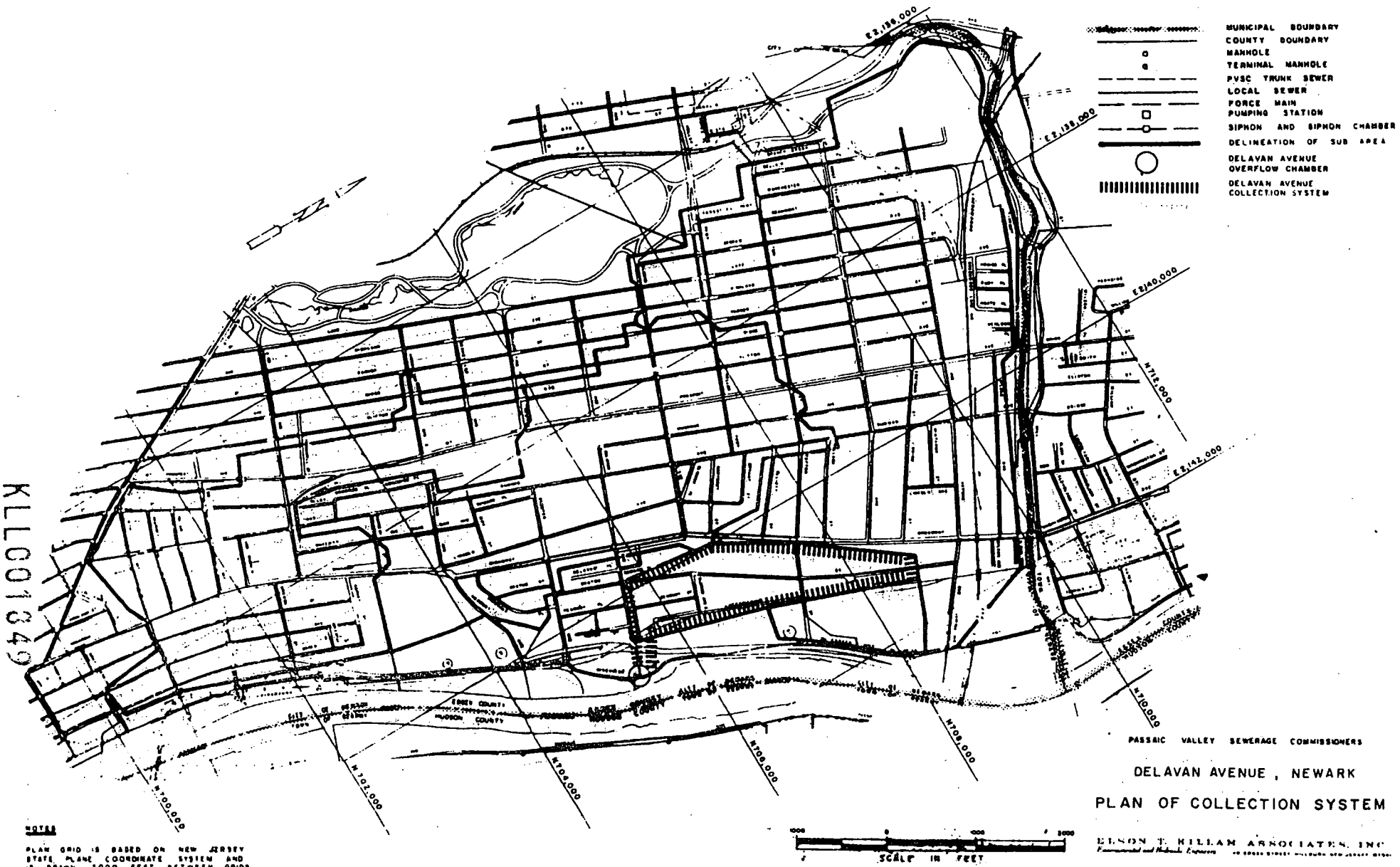
PASSAIC VALLEY SEWERAGE COMMISSIONERS

DELAVAN AVENUE, NEWARK

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC

PLATE C



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

DELAVAN AVENUE, NEWARK

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE D

KLL001349

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC RIVER OVERFLOWS

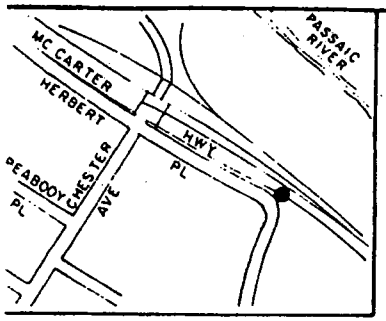
HERBERT PLACE, NEWARK

N-003

1976

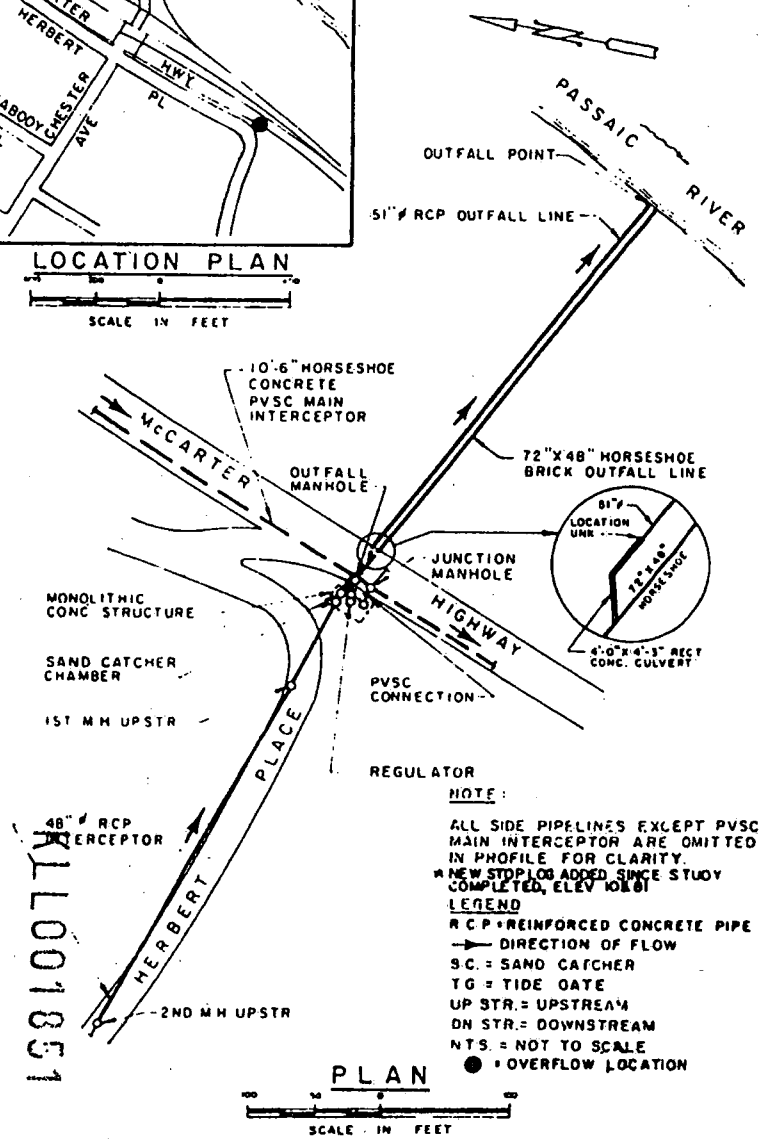
ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

KLL001850



LOCATION PLAN

SCALE IN FEET



NOTE:

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

* NEW STOP LOG ADDED SINCE STUDY COMPLETED, ELEV 105.53

LEGEND

R.C.P. = REINFORCED CONCRETE PIPE

→ DIRECTION OF FLOW

S.C. = SAND CATCHER

TG = TIDE GATE

UP STR. = UPSTREAM

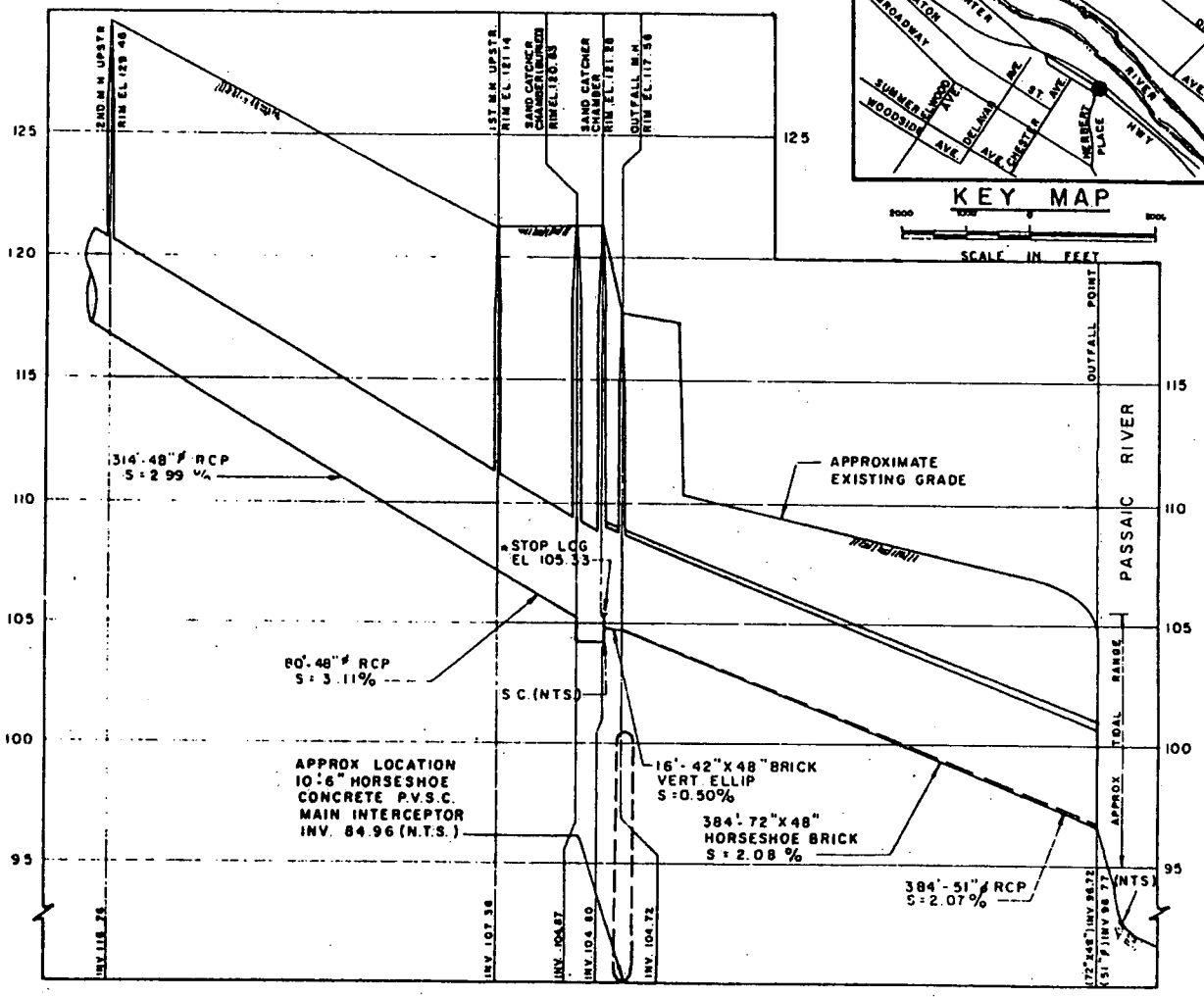
DN STR. = DOWNSTREAM

N.T.S. = NOT TO SCALE

● = OVERFLOW LOCATION

PLAN

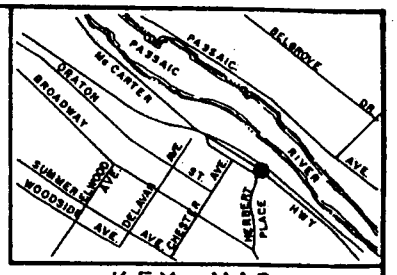
SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET



KEY MAP

SCALE IN FEET

ALL ELEVATIONS BASED ON U.S.G.S. MH 1952 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER N-003

HERBERT PLACE, NEWARK

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

PLATE A

N-L00185

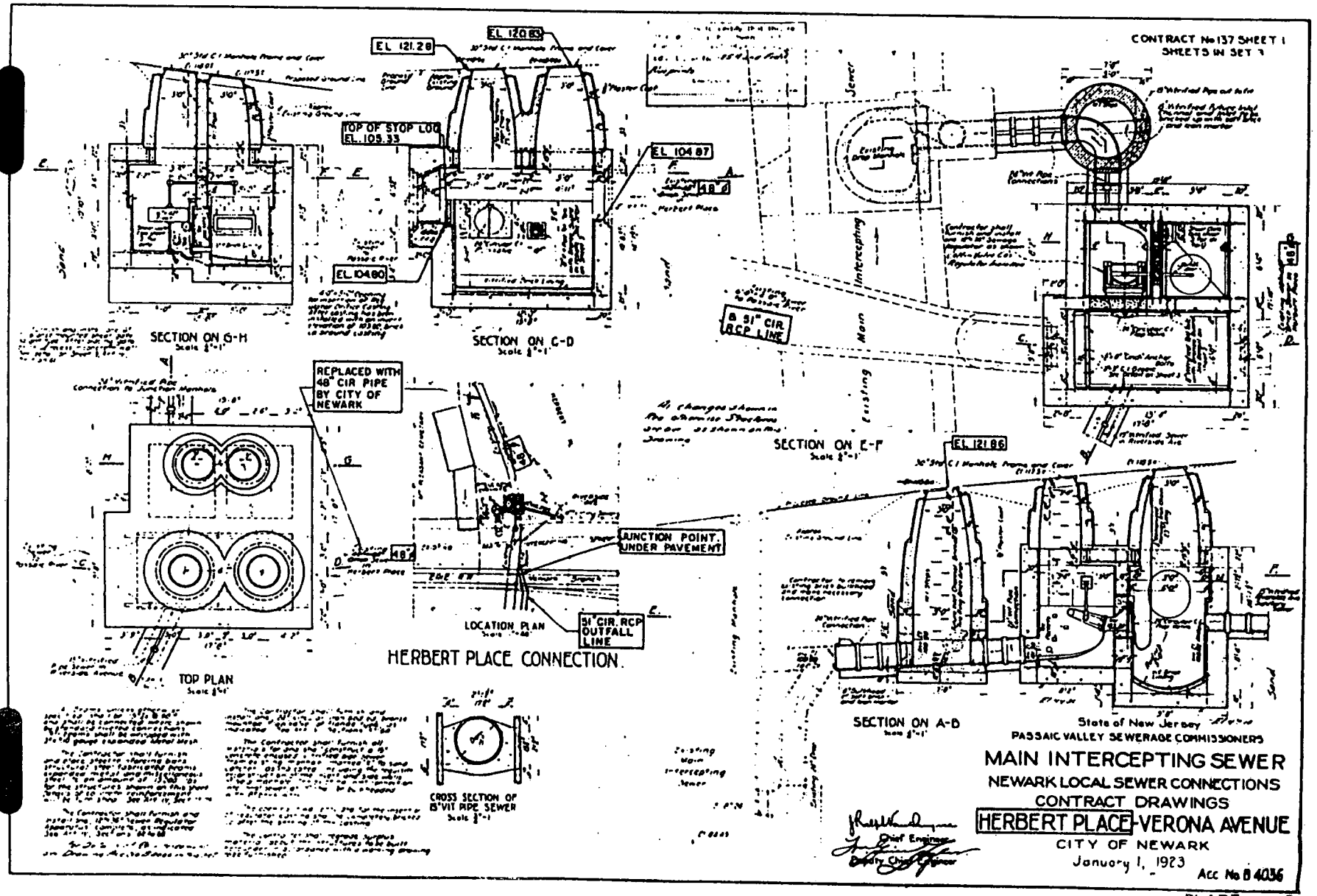
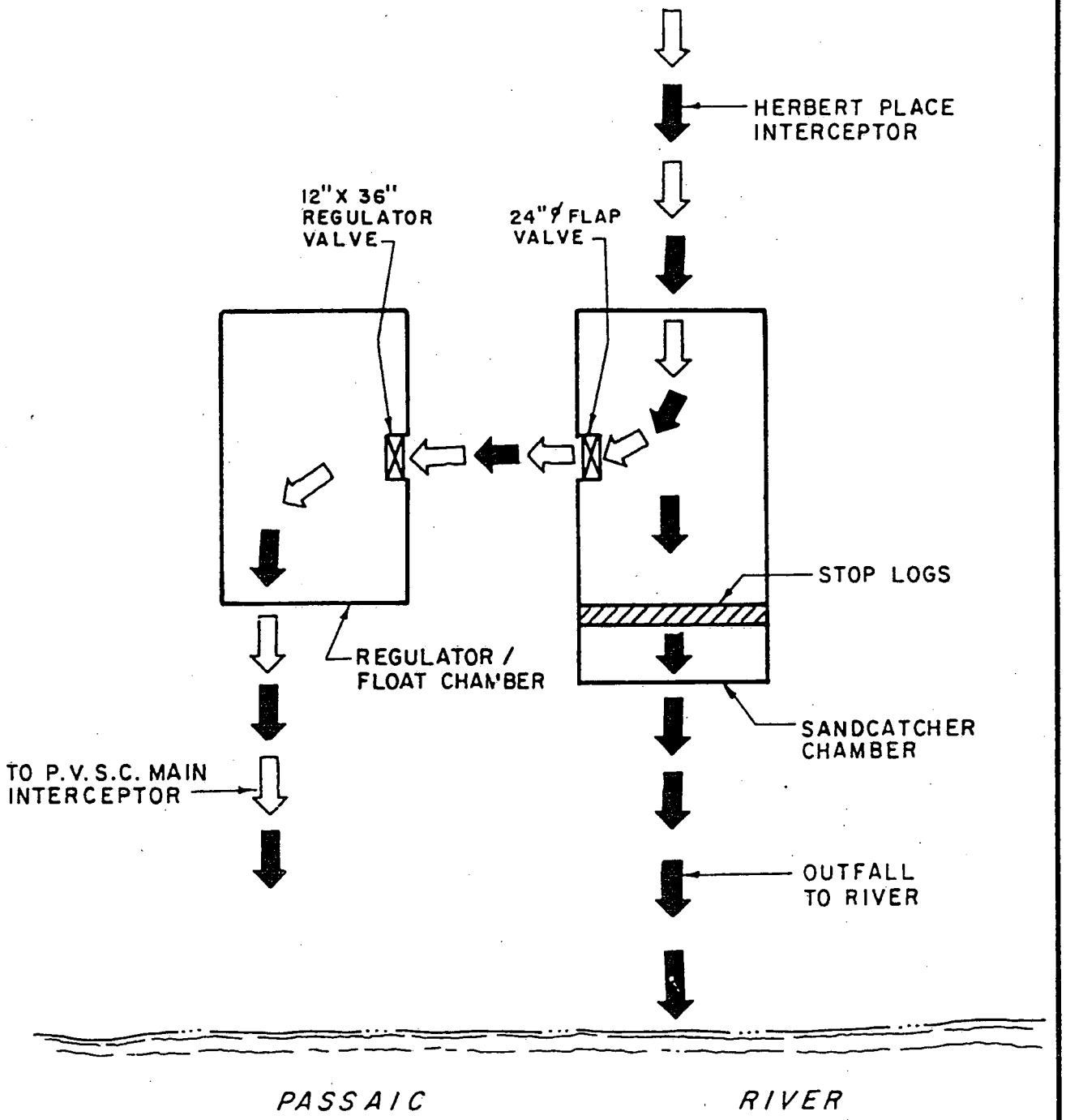


PLATE 8

(3)

KLL0018652



LEGEND

DRY WEATHER FLOW

STORM FLOW / OVERFLOW

KLL001853

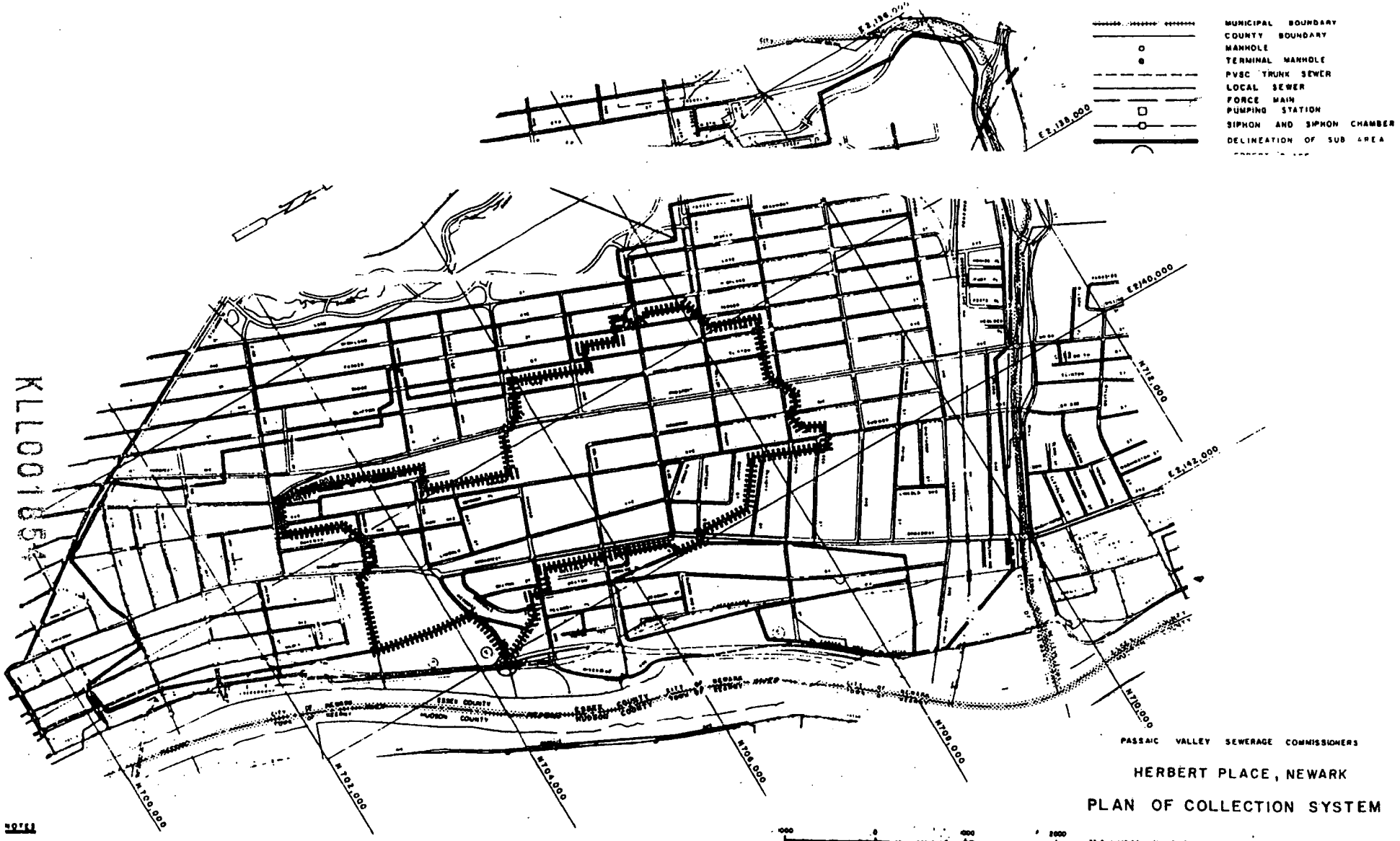
PASSAIC VALLEY SEWERAGE COMMISSIONERS

HERBERT PLACE, NEWARK

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC.
Environmental and Hydraulic Engineers

PLATE C



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

HERBERT PLACE, NEWARK

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE D

KLL00185

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

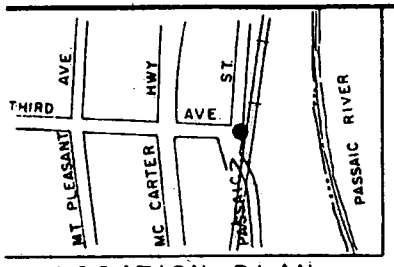
PASSAIC RIVER OVERFLOWS

THIRD AVENUE, NEWARK
N-004

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers [illegible] ESSEX STREET MILLBURN NEW JERSEY [illegible]

KLLC01855

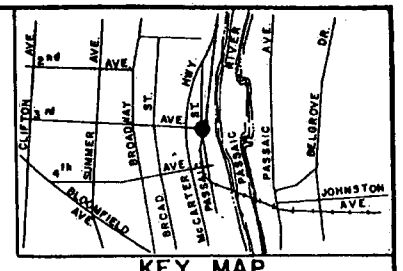


LOCATION PLAN

400 200 0 400
SCALE IN FEET

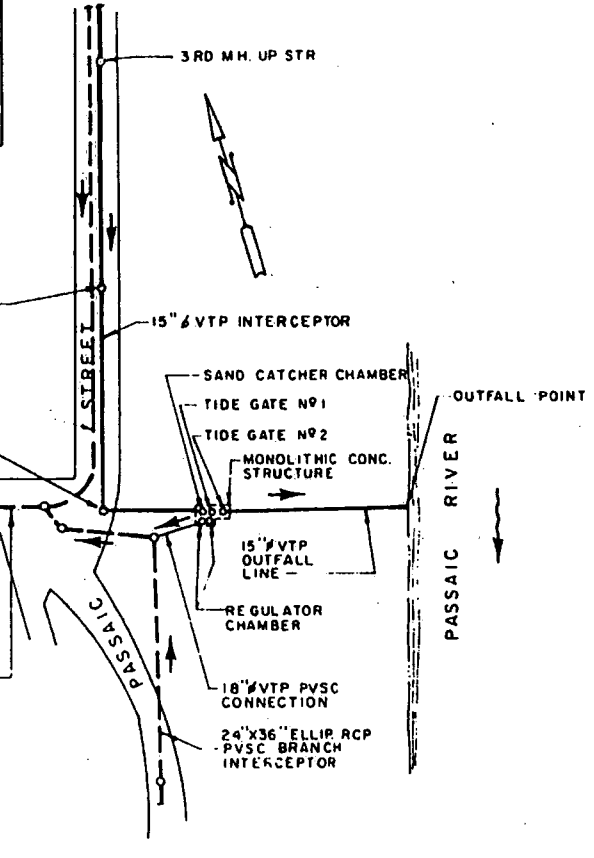
NOTE:
ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

LEGEND:
- DIRECTION OF FLOW
- S.C. = SAND CATCHER
- T.G. = TIDE GATE
- UP STR = UP STREAM
- DN. STR. = DOWN STREAM
- N.T.S. = NOT TO SCALE
- V.T.P. = VITRIFIED TILE PIPE
- R.C.P. = REINFORCED CONCRETE PIPE
- ● = OVERFLOW LOCATION



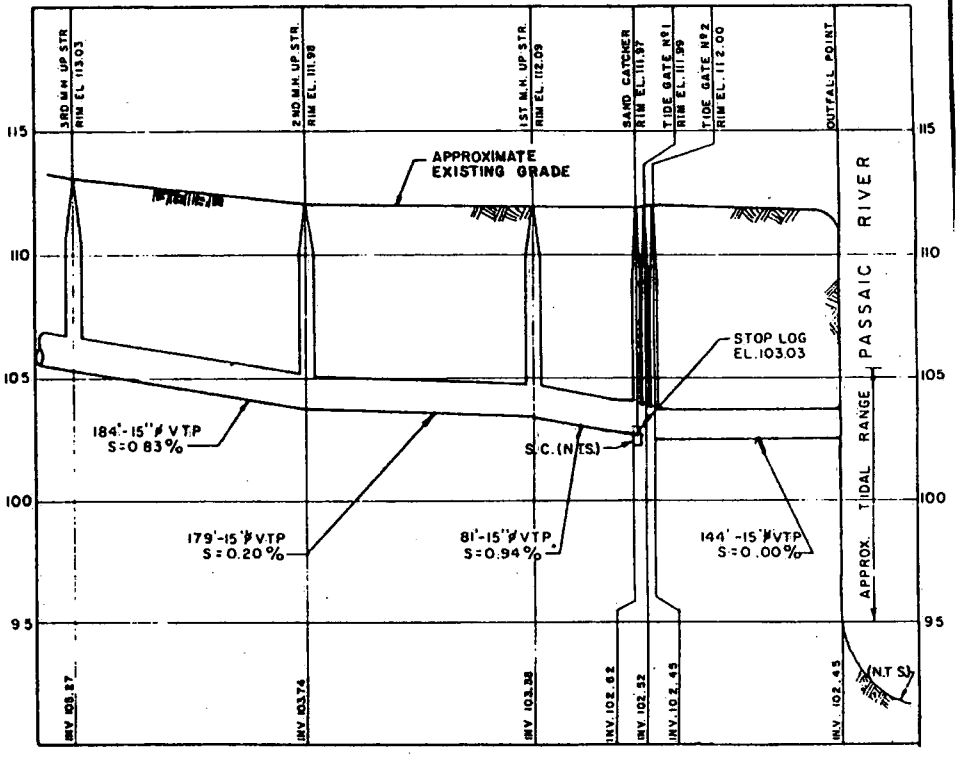
KEY MAP

2000 1000 0 2000
SCALE IN FEET



PLAN

100 50 0 100
SCALE IN FEET



PROFILE

100 50 0 100
HORIZ. SCALE IN FEET

8 0 8
VERT. SCALE IN FEET

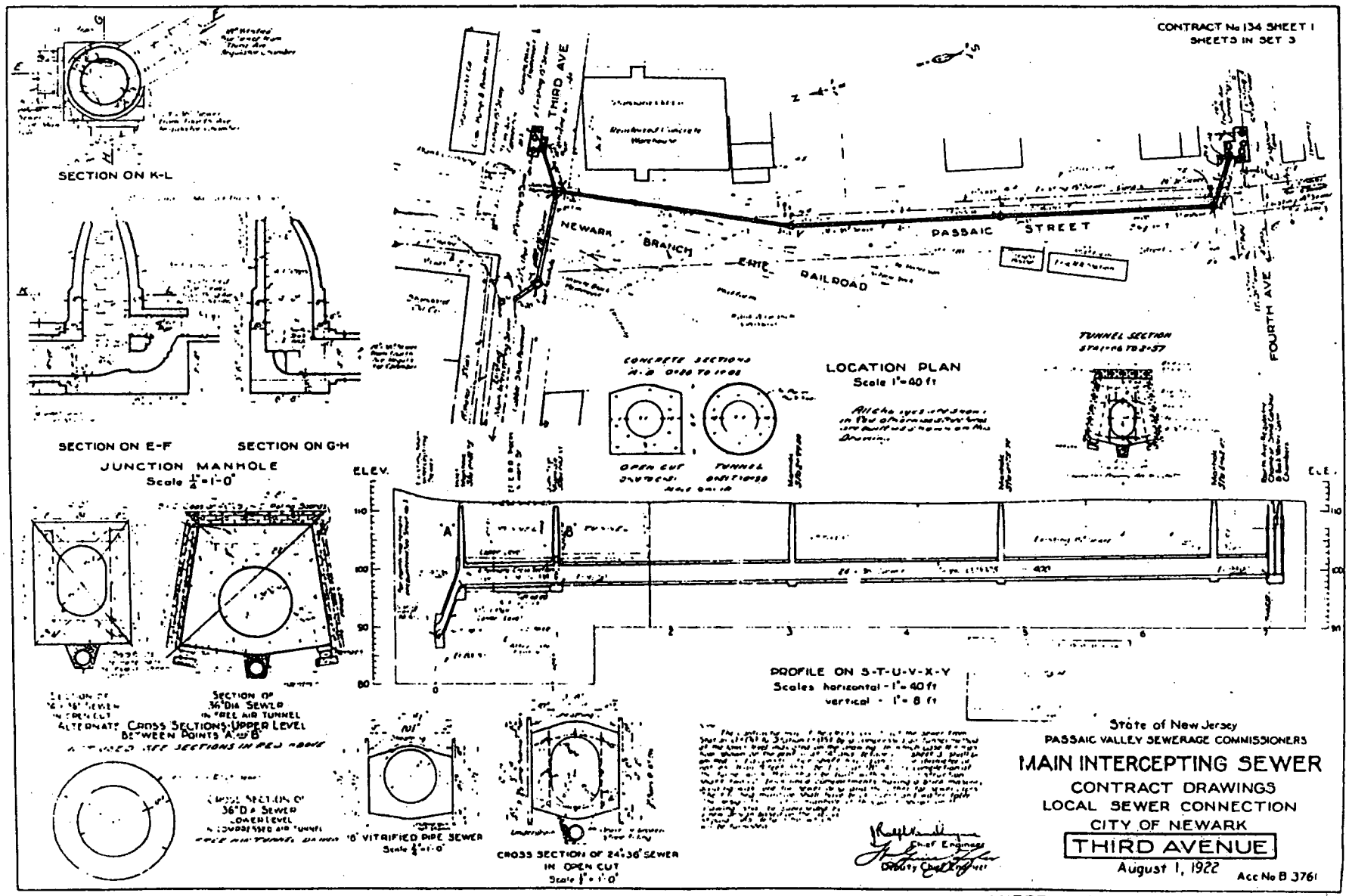
PASSAIC VALLEY SEWERAGE COMMISSIONERS
OVERFLOW CHAMBER N-004
THIRD AVENUE, NEWARK
PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.
Environmental and Hydraulic Engineers

ALL ELEVATIONS BASED ON B.M. Nº 9860A AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX

KLLC01856

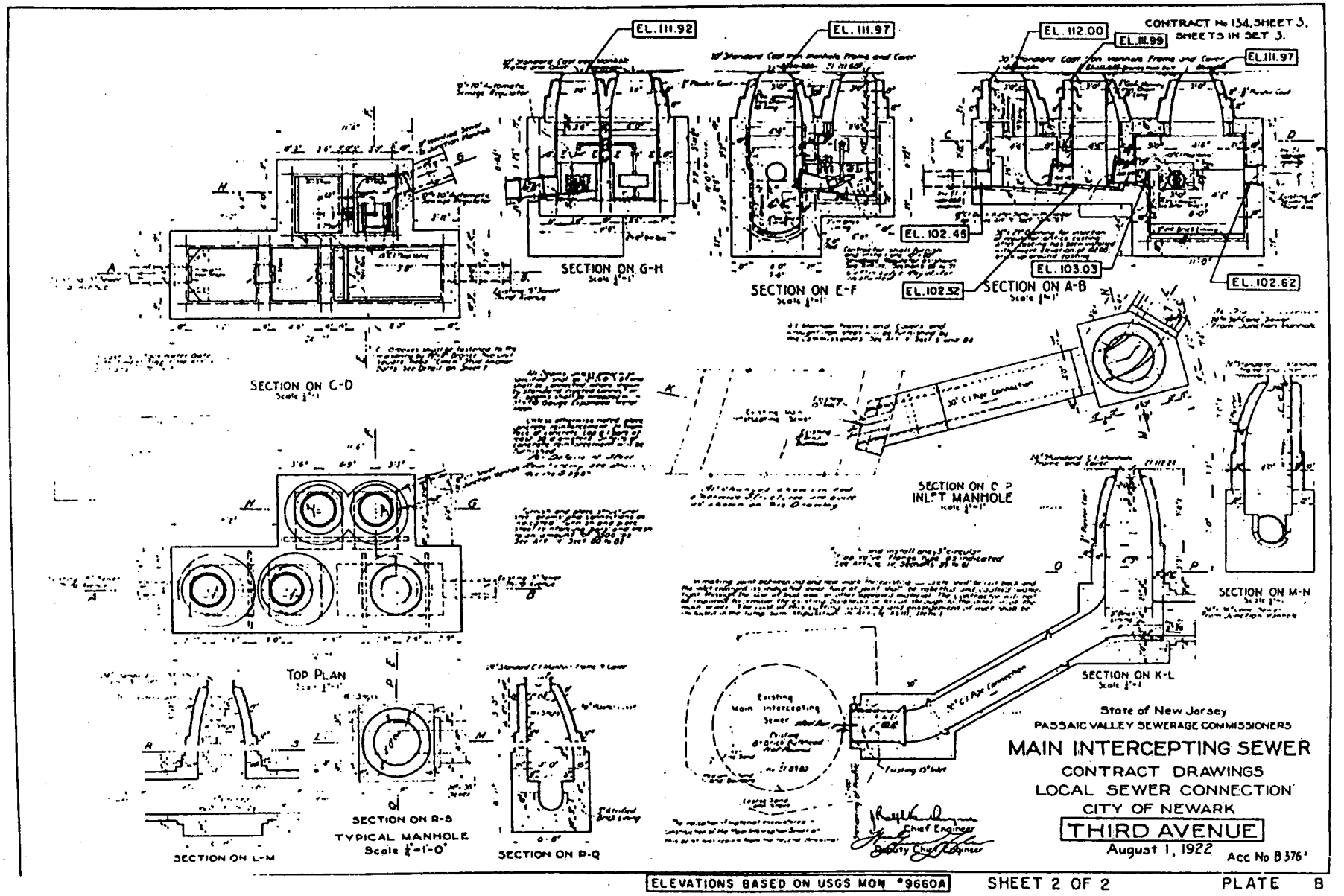
PLATE



SHEET 1 OF 2 PLATE B

(3A)

KLL001857



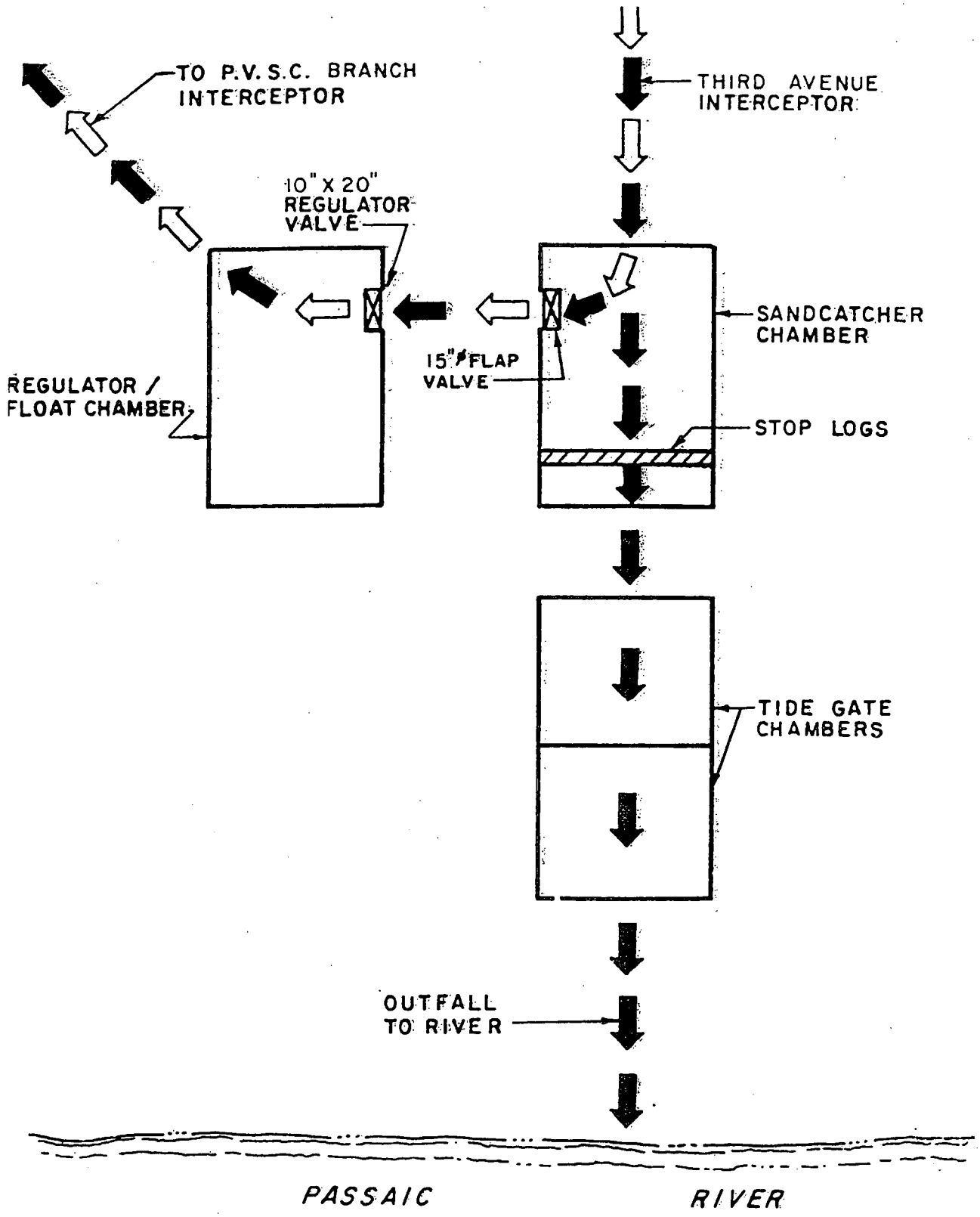
ELEVATIONS BASED ON USGS MON #9660A

SHEET 2 OF 2

PLATE B

(3 B)

KLL001858



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001859

PASSAIC VALLEY SEWERAGE COMMISSIONERS

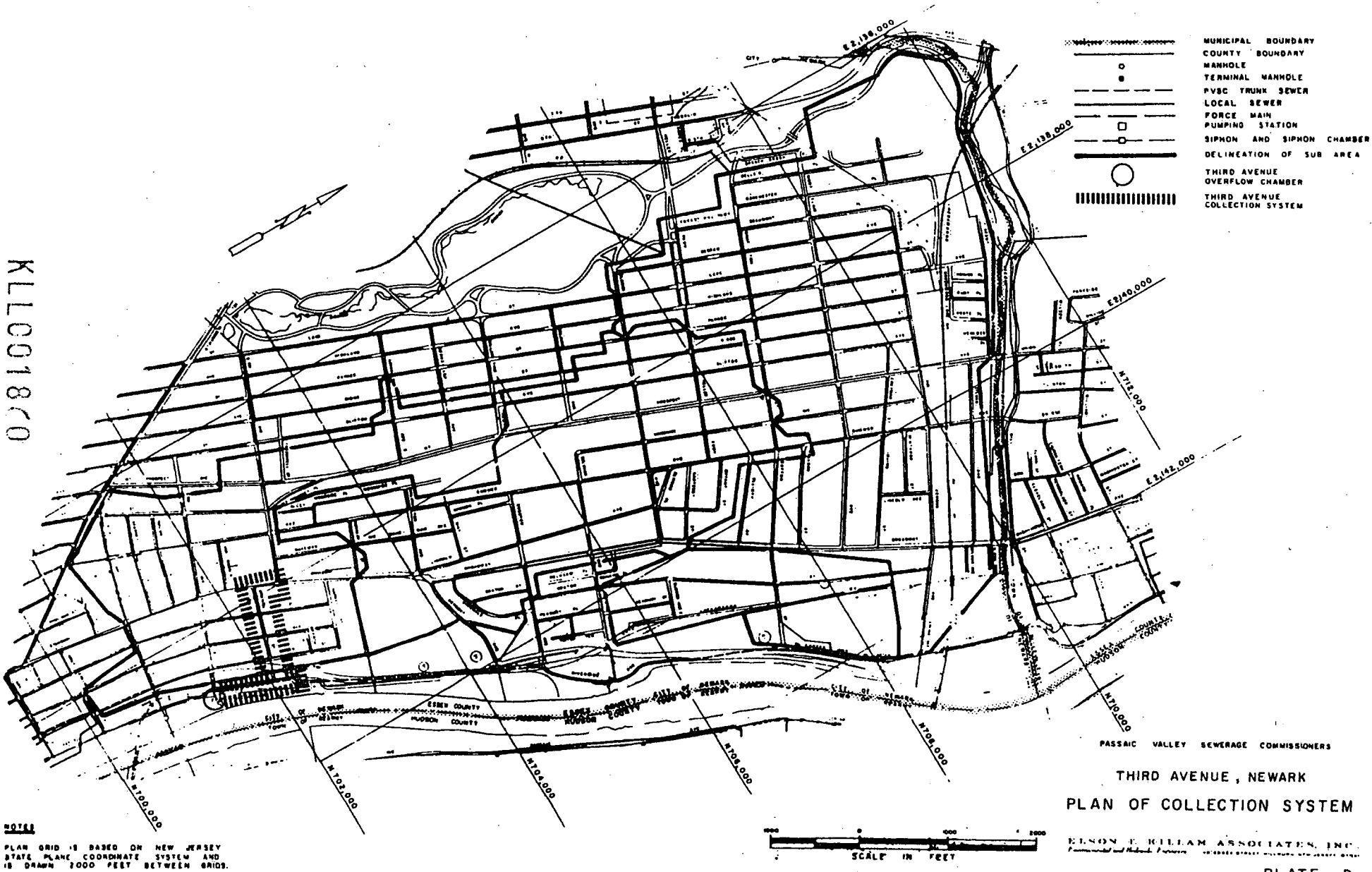
THIRD AVENUE, NEWARK

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE C



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

THIRD AVENUE, NEWARK

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE D

KLL00018/0

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

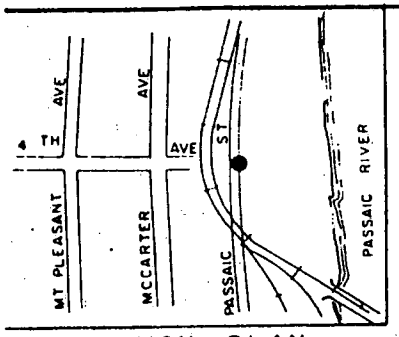
PASSAIC RIVER OVERFLOWS

FOURTH AVENUE, NEWARK
N-005

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

KLL001861

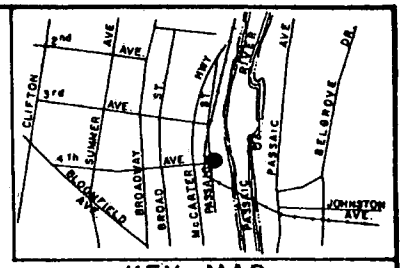


LOCATION PLAN

SCALE IN FEET

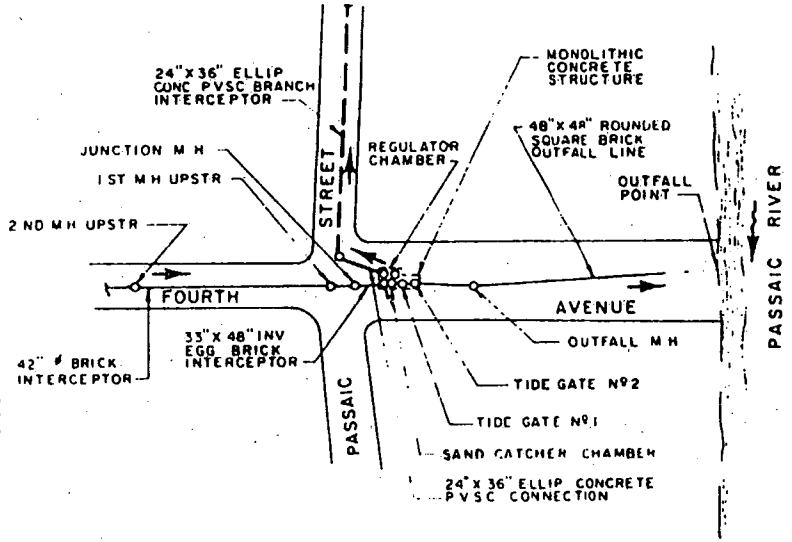
NOTE:
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

LEGEND:
→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
N.T.S. = NOT TO SCALE
● = OVERFLOW LOCATION



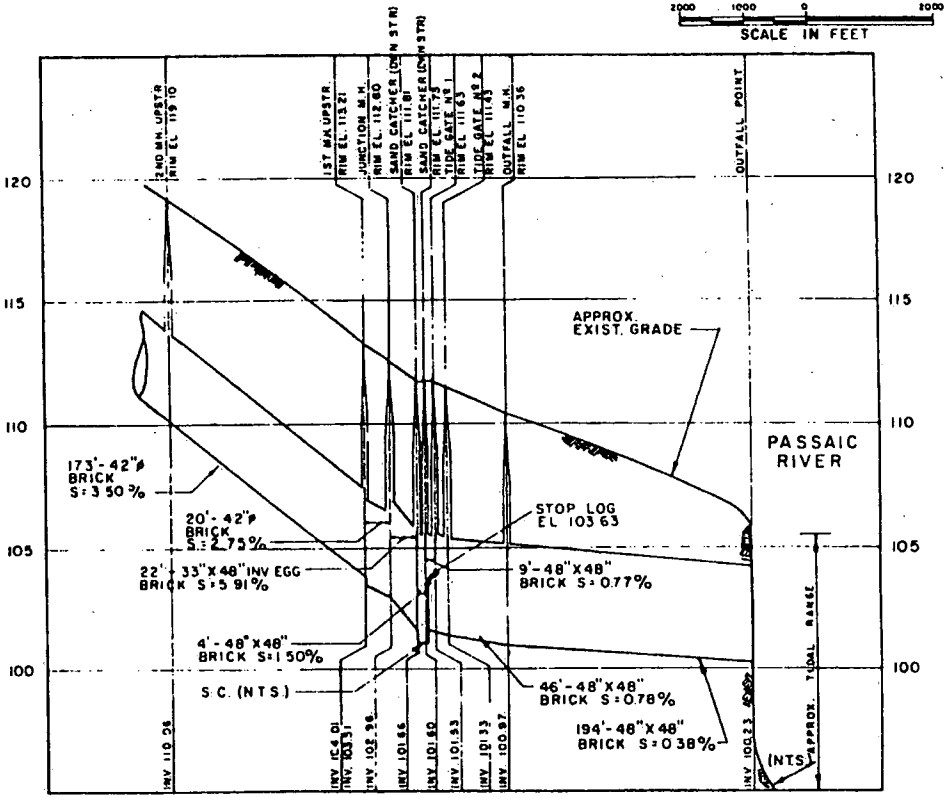
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT SCALE IN FEET

KLL001862

ALL ELEVATIONS BASED ON B.M. Nº 84004 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER N-005

FOURTH AVENUE, NEWARK

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Consulting and Hydraulic Engineers

PLATE

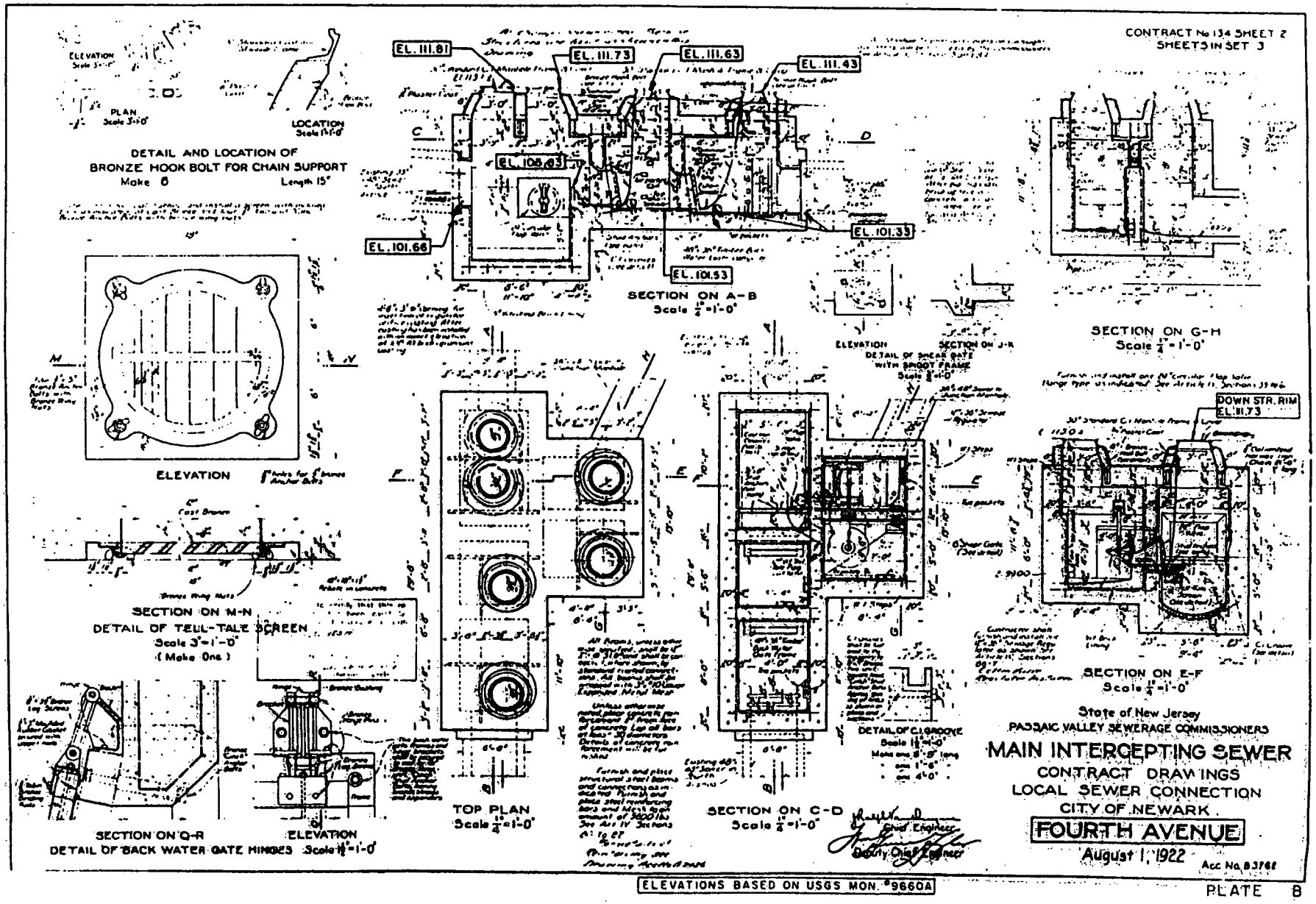


PLATE 8

(3)

KLL001863

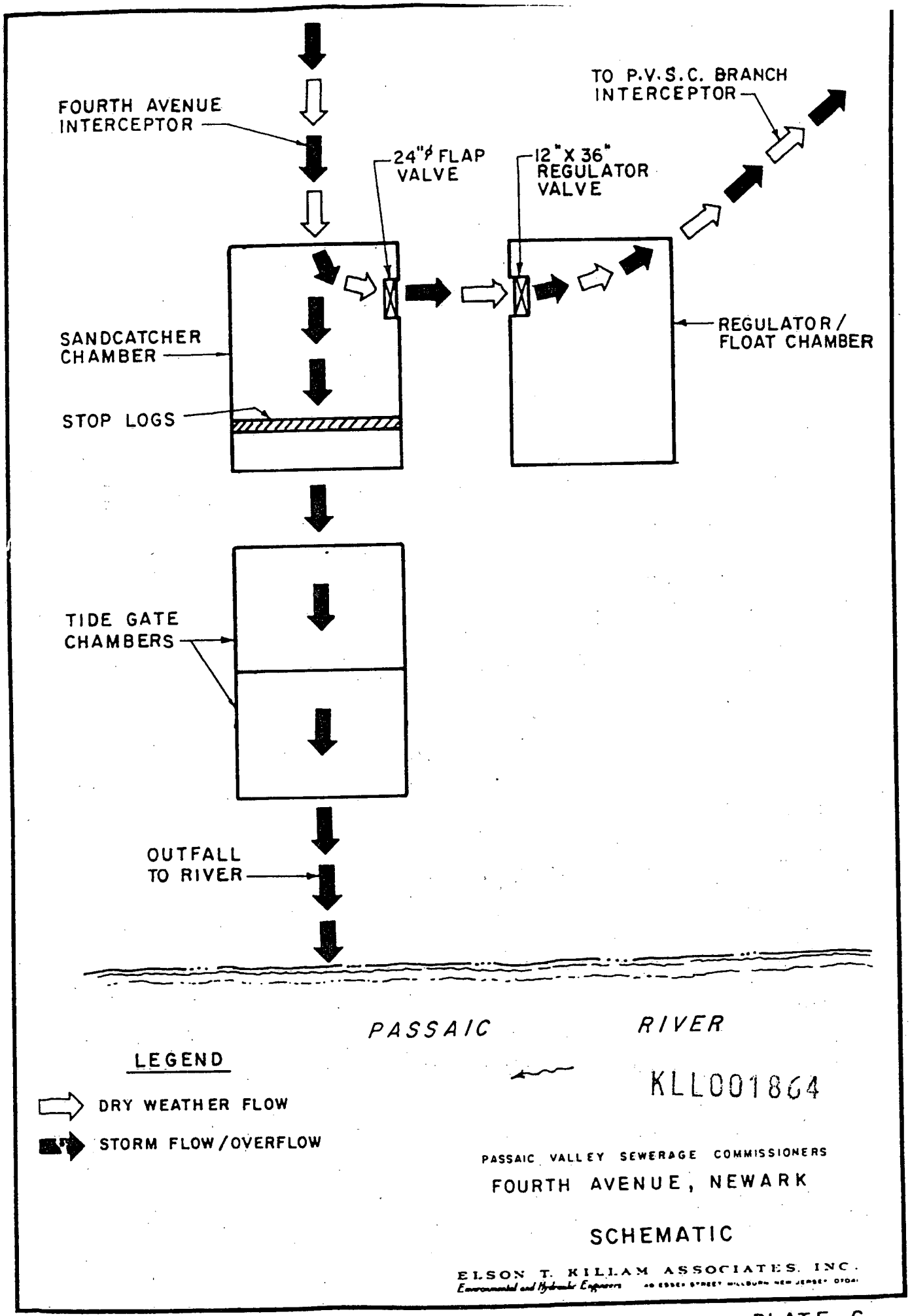
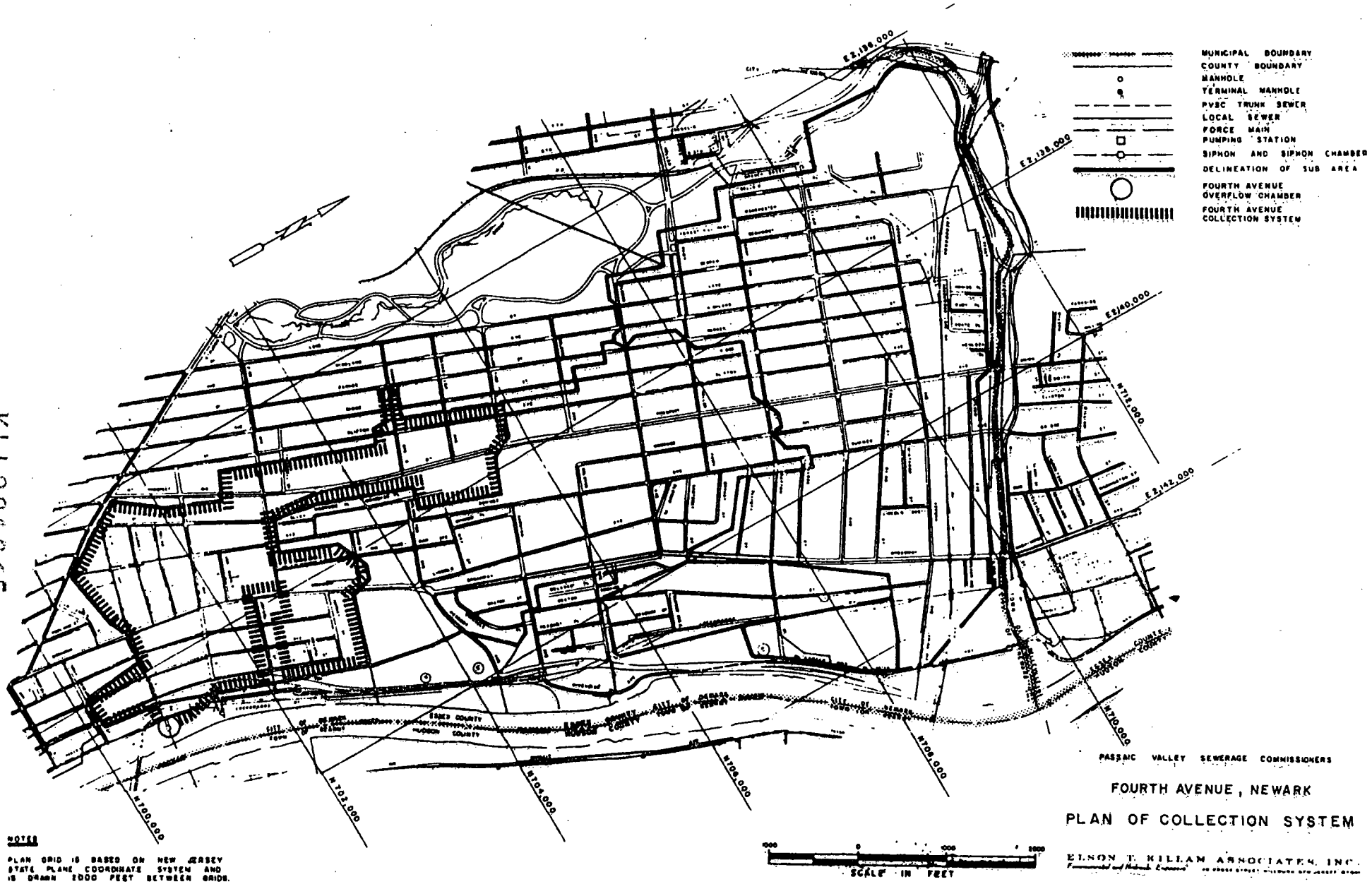

FOURTH AVENUE INTERCEPTOR
24"ϕ FLAP VALVE
12" X 36" REGULATOR VALVE
TO P.V.S.C. BRANCH INTERCEPTOR
SANDCATCHER CHAMBER
STOP LOGS
REGULATOR / FLOAT CHAMBER
TIDE GATE CHAMBERS
OUTFALL TO RIVER
PASSAIC RIVER
LEGEND
DRY WEATHER FLOW
STORM FLOW/OVERFLOW
KLL001864
PASSAIC VALLEY SEWERAGE COMMISSIONERS
FOURTH AVENUE, NEWARK
SCHEMATIC
ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE C



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

FOURTH AVENUE, NEWARK

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE D

KL1001865

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC RIVER OVERFLOWS

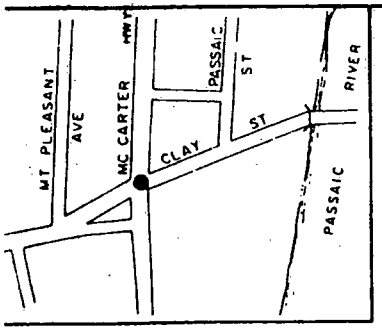
CLAY STREET, NEWARK

N-006

1976

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers [illegible]

KLLC01866



LOCATION PLAN

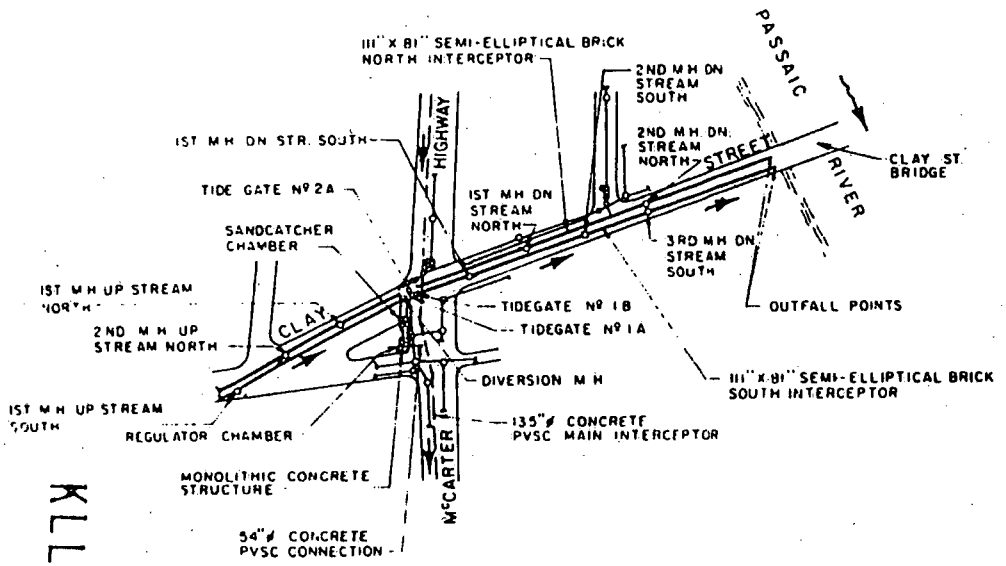
SCALE IN FEET

NOTE

ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

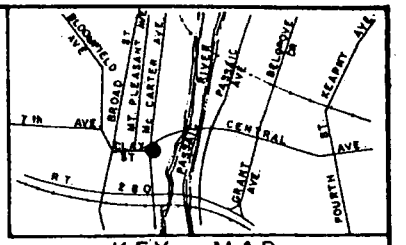
LEGEND

→ DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR = UP STREAM
DN STR = DOWN STREAM
N.T.S. = NOT TO SCALE
● = OVERFLOW LOCATION



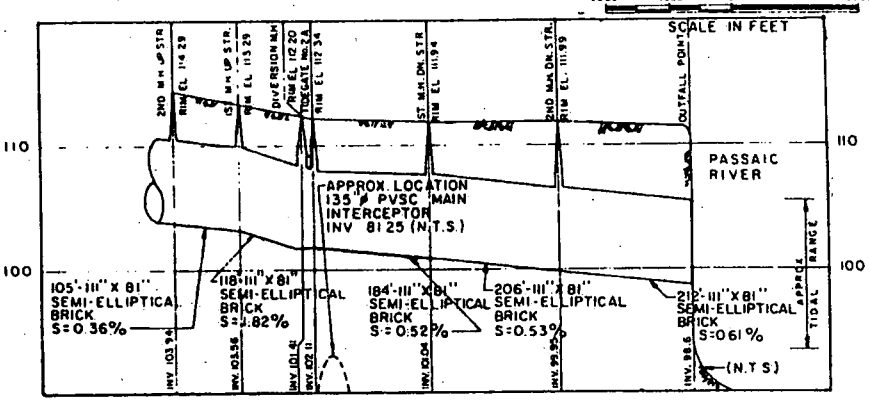
PLAN

SCALE IN FEET

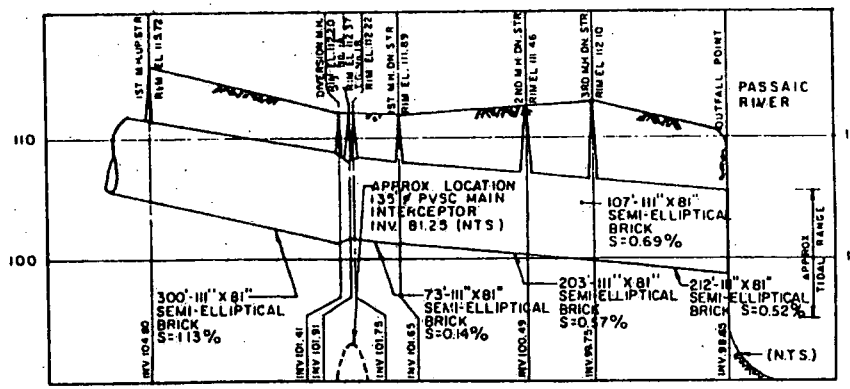


KEY MAP

SCALE IN FEET



NORTH INTERCEPTOR



PROFILES SOUTH INTERCEPTOR

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER N-006

CLAY STREET, NEWARK

PLAN AND PROFILES

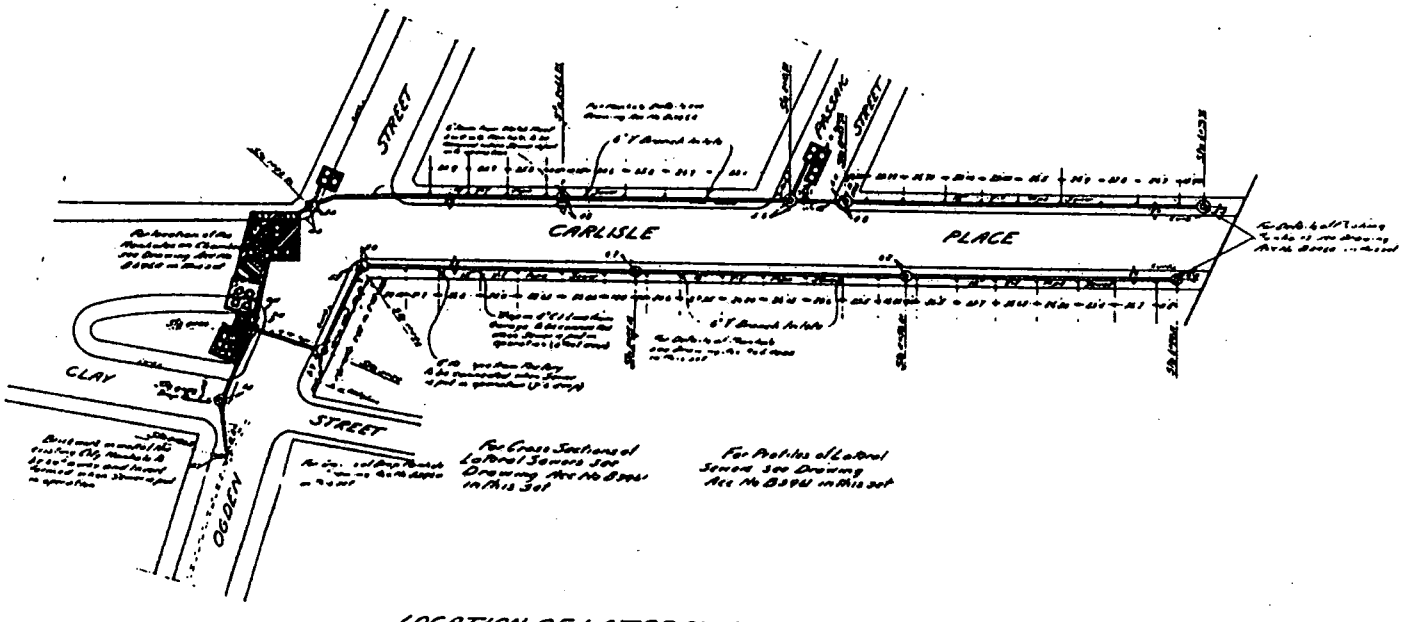
ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

ALL ELEVATIONS BASED ON B.M. N-9860A AS ESTABLISHED BY NEW JERSEY GEODETIC SURVEY CONTROL. FOR LOCATION AND DESCRIPTION SEE APPENDIX.

KLL001867

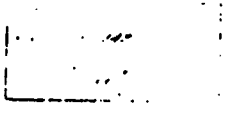
PLATE A



LOCATION OF LATERAL SEWERS

AND

6 INCH 'Y' BRANCH INLETS

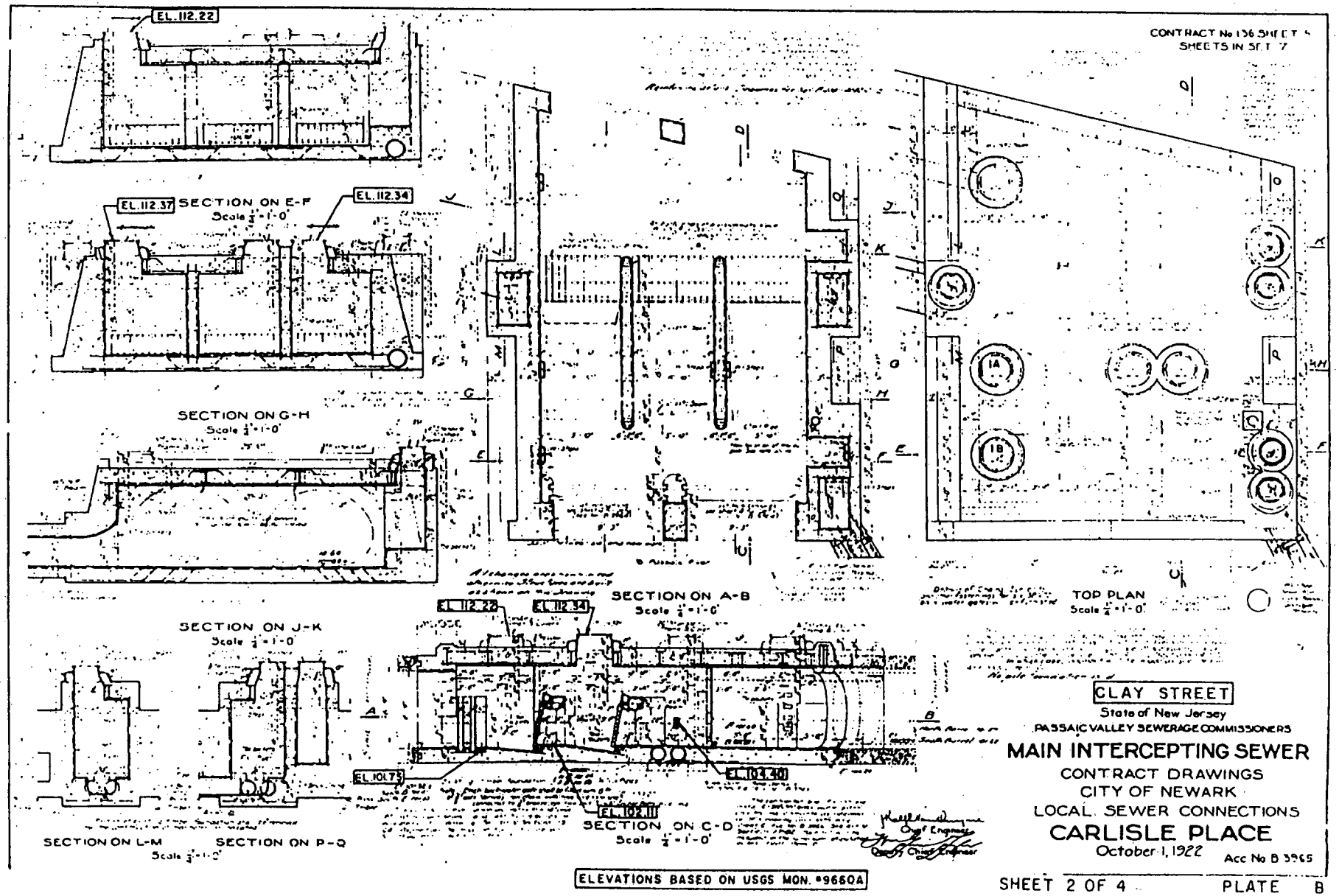


CLAY STREET

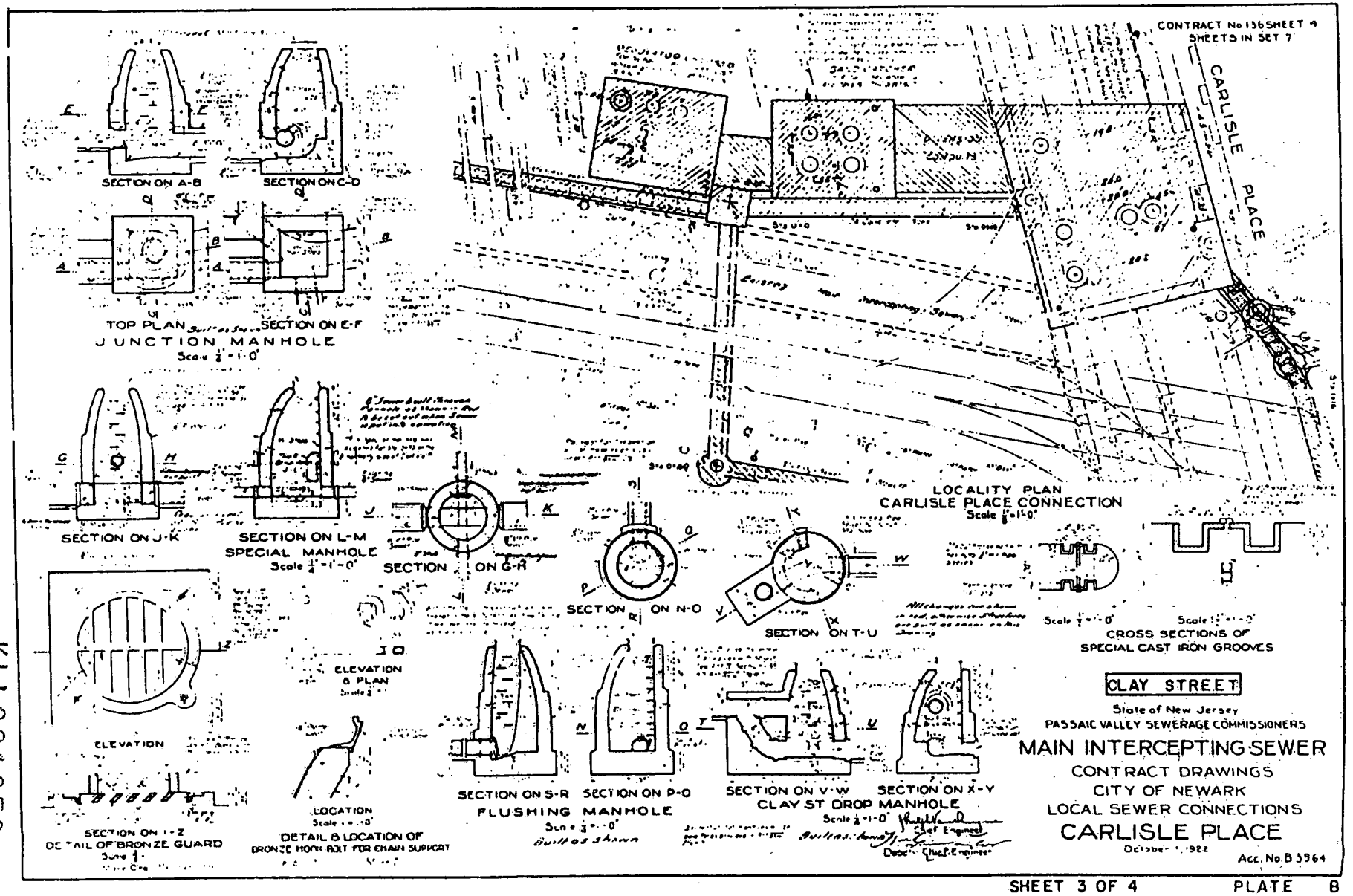
SHEET 1 OF 4 PLATE B

(3A)

KLLC01868


CONTRACT No 136 SHEET 5
SHEETS IN SET 7
EL. 112.22
EL. 112.37
SECTION ON E-F
Scale 1/4"=1'-0"
EL. 112.34
SECTION ON G-H
Scale 1/4"=1'-0"
SECTION ON J-K
Scale 1/4"=1'-0"
SECTION ON L-M
Scale 1/4"=1'-0"
SECTION ON P-Q
EL. 112.22
EL. 112.34
SECTION ON A-B
Scale 1/4"=1'-0"
EL. 101.75
EL. 104.40
EL. 102.11
SECTION ON C-D
Scale 1/4"=1'-0"
TOP PLAN
Scale 1/4"=1'-0"
CLAY STREET
State of New Jersey
PASSAIC VALLEY SEWERAGE COMMISSIONERS
MAIN INTERCEPTING SEWER
CONTRACT DRAWINGS
CITY OF NEWARK
LOCAL SEWER CONNECTIONS
CARLISLE PLACE
October 1, 1922
Acc No B 3965
Chief Engineer
Deputy Chief Engineer
ELEVATIONS BASED ON USGS MON. #9660A
SHEET 2 OF 4
PLATE B

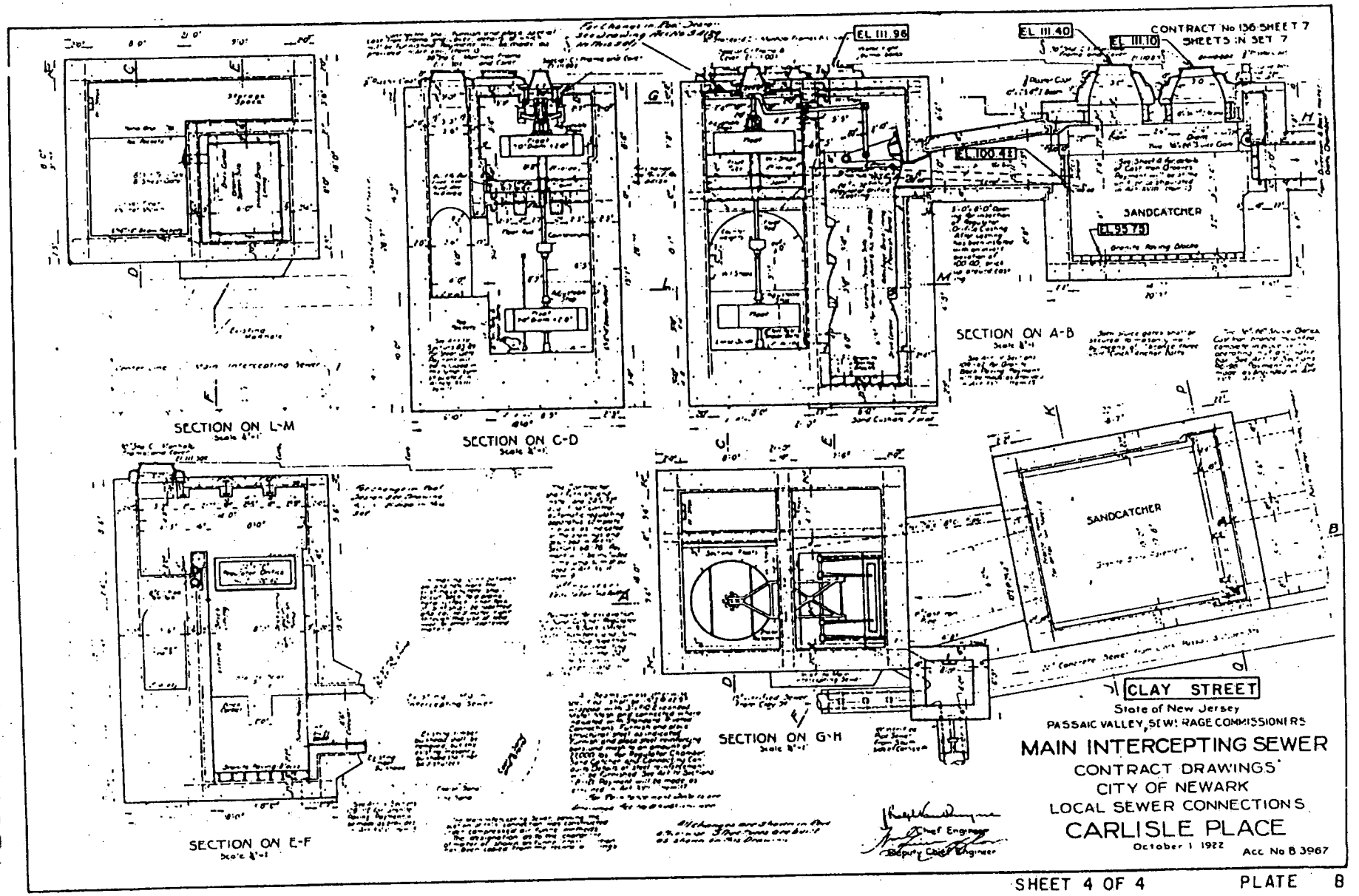
KLL001869



SHEET 3 OF 4 PLATE B

KLL001070

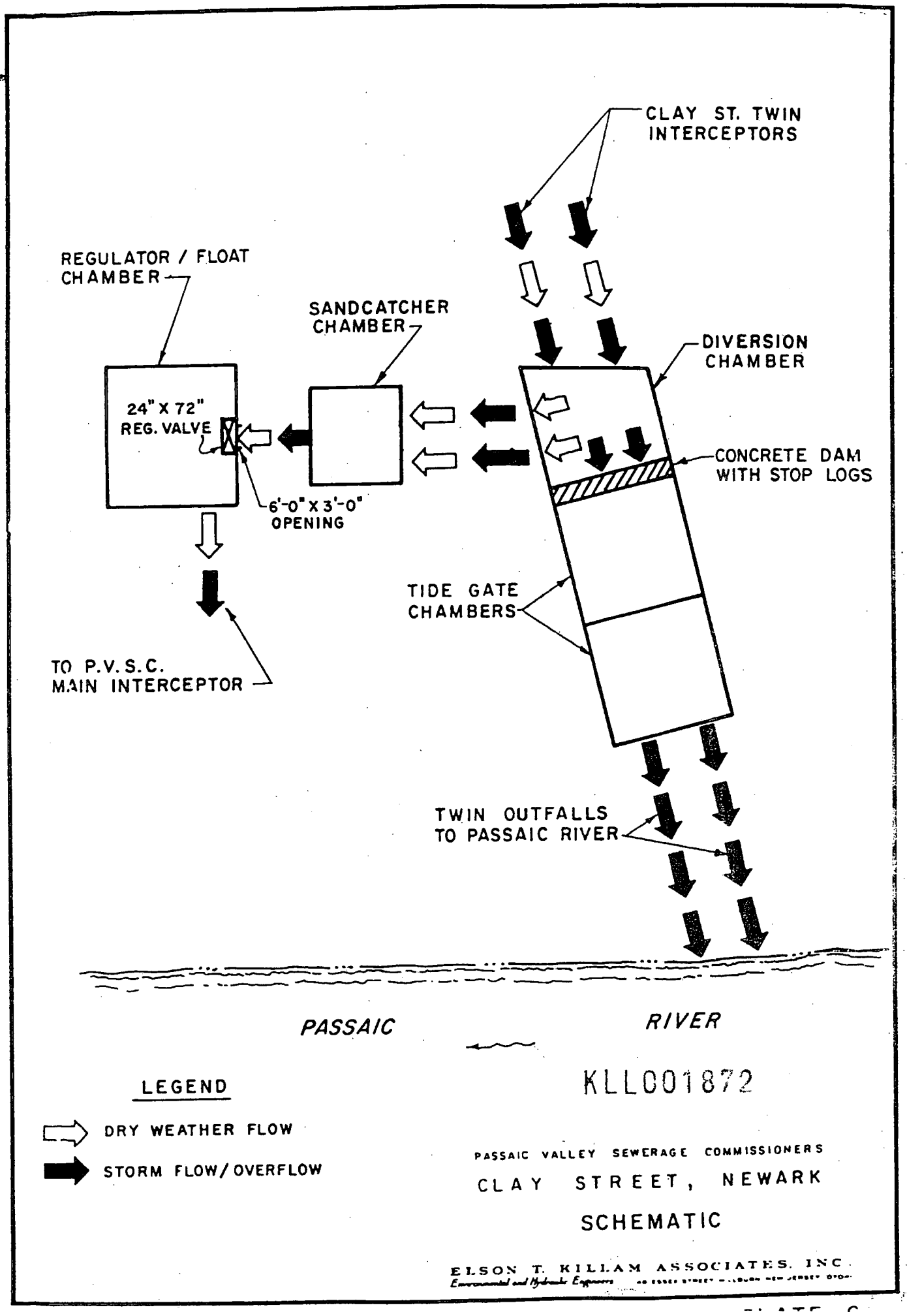
(3C)

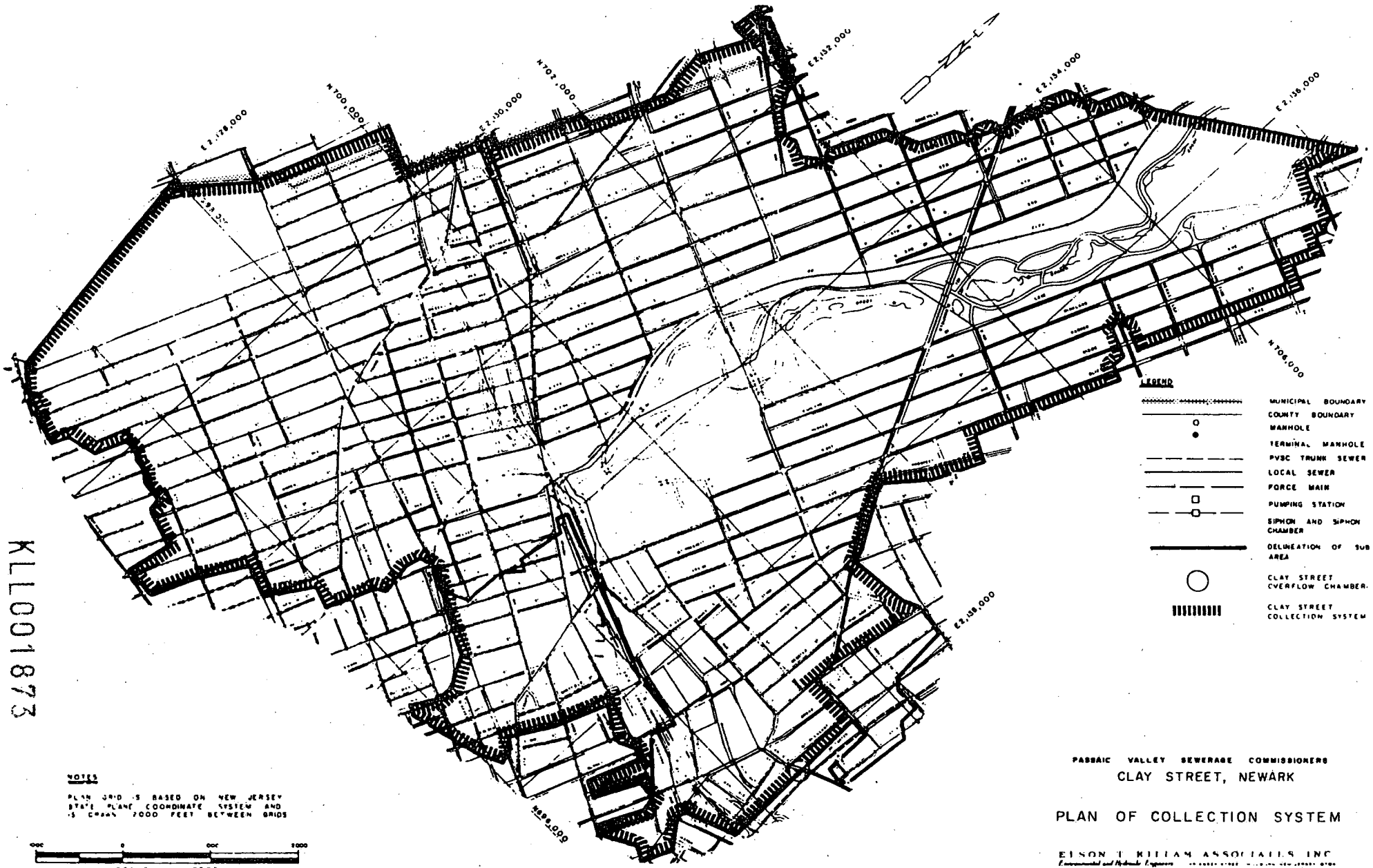


SHEET 4 OF 4 PLATE 8

(3D)

KLL001871


CLAY ST. TWIN INTERCEPTORS
REGULATOR / FLOAT CHAMBER
SANDCATCHER CHAMBER
DIVERSION CHAMBER
24" X 72" REG. VALVE
CONCRETE DAM WITH STOP LOGS
6'-0" X 3'-0" OPENING
TIDE GATE CHAMBERS
TO P.V.S.C. MAIN INTERCEPTOR
TWIN OUTFALLS TO PASSAIC RIVER
PASSAIC
RIVER
LEGEND
DRY WEATHER FLOW
STORM FLOW/OVERFLOW
KLL001872
PASSAIC VALLEY SEWERAGE COMMISSIONERS
CLAY STREET, NEWARK
SCHEMATIC
ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS CHAIN 2000 FEET BETWEEN GRIDS

SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

CLAY STREET, NEWARK

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE D

KLL001873

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

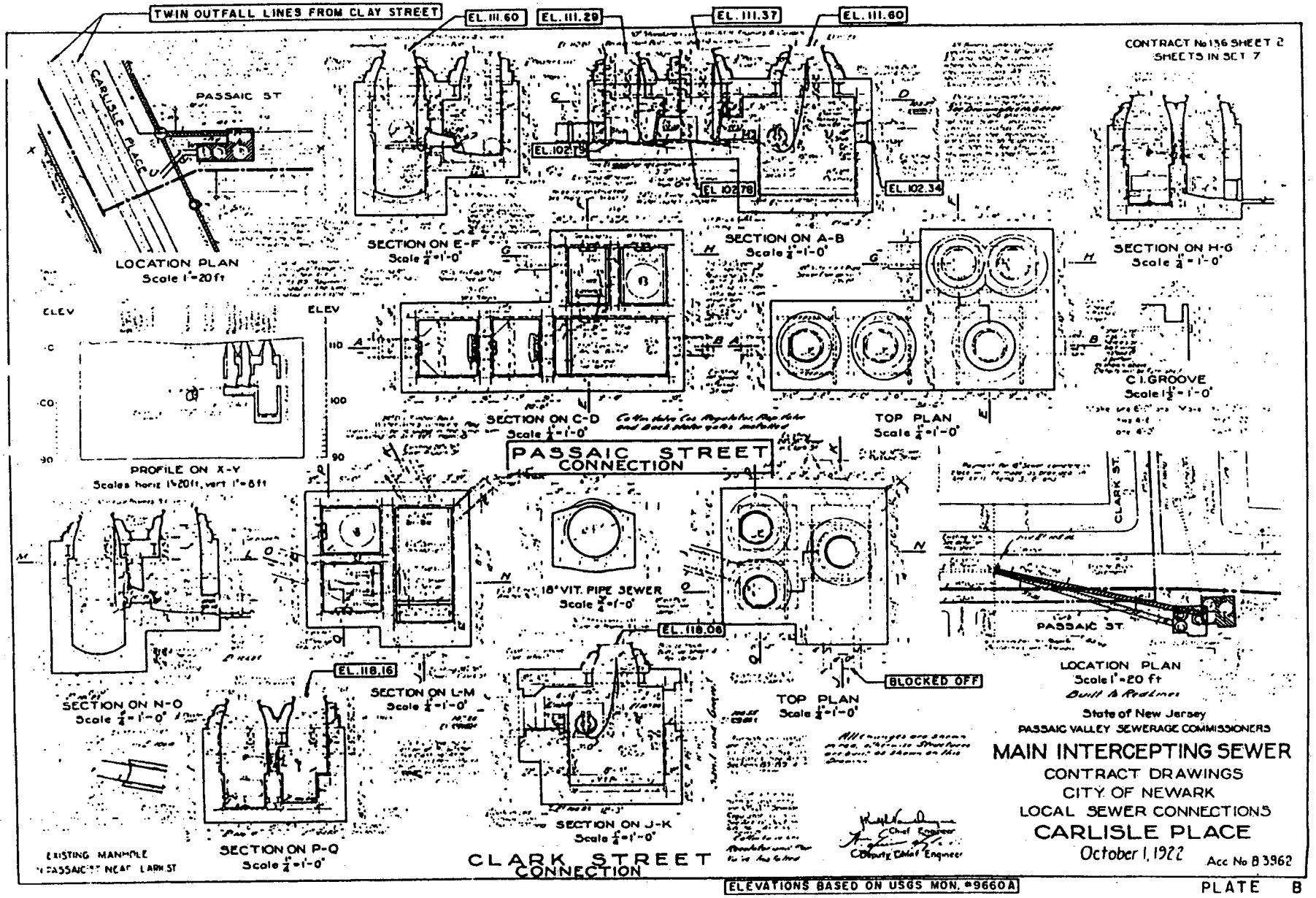
PASSAIC RIVER OVERFLOWS

PASSAIC STREET, NEWARK
N-006C

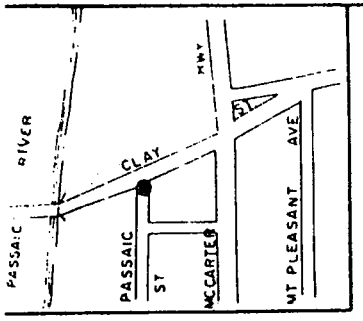
1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001874


TWIN OUTFALL LINES FROM CLAY STREET
EL. 111.60
EL. 111.29
EL. 111.37
EL. 111.60
CONTRACT No 136 SHEET 2
SHEETS IN SET 7
PASSAIC ST
CARLISLE PLACE
EL. 102.79
EL. 102.78
EL. 102.34
LOCATION PLAN
Scale 1"=20 ft
SECTION ON E-F
Scale 1/4"=1'-0"
SECTION ON A-B
Scale 1/4"=1'-0"
SECTION ON H-G
Scale 1/4"=1'-0"
ELEV
ELEV
110
100
90
PROFILE ON X-Y
Scales horiz 1"=20 ft, vert 1"=8 ft
SECTION ON C-D
Scale 1/4"=1'-0"
TOP PLAN
Scale 1/4"=1'-0"
C.I. GROOVE
Scale 1 1/2"=1'-0"
PASSAIC STREET
CONNECTION
CLARK ST.
18" VIT. PIPE SEWER
Scale 3/4"=1'-0"
EL. 118.06
EL. 118.16
BLOCKED OFF
PASSAIC ST.
LOCATION PLAN
Scale 1"=20 ft
Built to Redlines
SECTION ON N-O
Scale 1/4"=1'-0"
SECTION ON L-M
Scale 1/4"=1'-0"
TOP PLAN
Scale 1/4"=1'-0"
State of New Jersey
PASSAIC VALLEY SEWERAGE COMMISSIONERS
MAIN INTERCEPTING SEWER
CONTRACT DRAWINGS
CITY OF NEWARK
LOCAL SEWER CONNECTIONS
CARLISLE PLACE
October 1, 1922
Acc No B 3962
SECTION ON J-K
Scale 1/4"=1'-0"
SECTION ON P-Q
Scale 1/4"=1'-0"
EXISTING MANHOLE
IN PASSAIC ST NEAR CLARK ST
CLARK STREET
CONNECTION
Chief Engineer
Deputy Chief Engineer
ELEVATIONS BASED ON USGS MON. #9660A
PLATE B

KLL001875

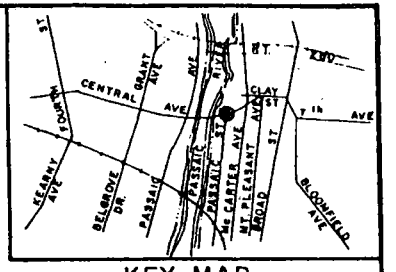


LOCATION PLAN

SCALE IN FEET

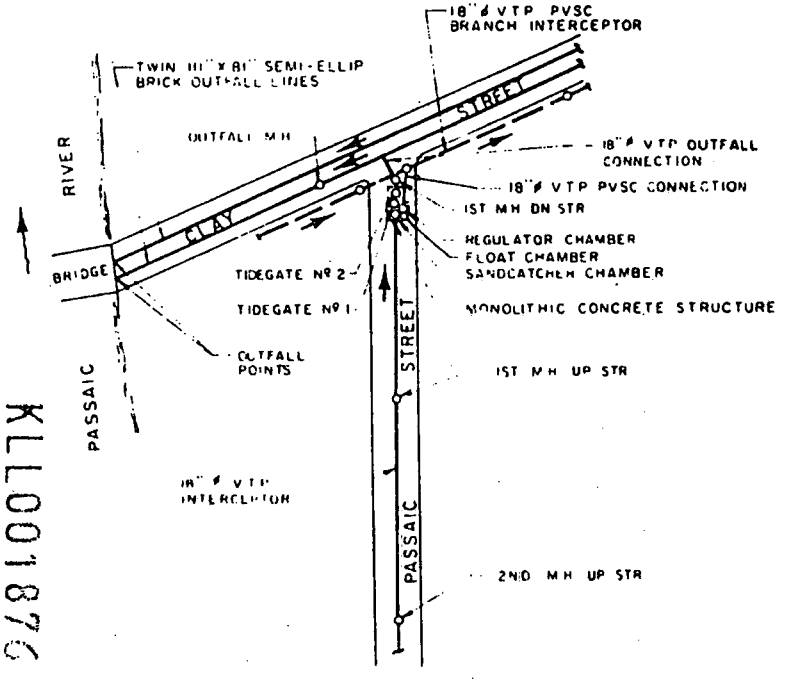
NOTE
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

LEGEND
- DIRECTION OF FLOW
- SC : SAND CATCHER
- T.G. : TIDE GATE
- UP STR : UP STREAM
- DN. STR : DOWN STREAM
- N.T.S : NOT TO SCALE
- V.T.P. : VITRIFIED TILE PIPE
- ● : OVERFLOW LOCATION



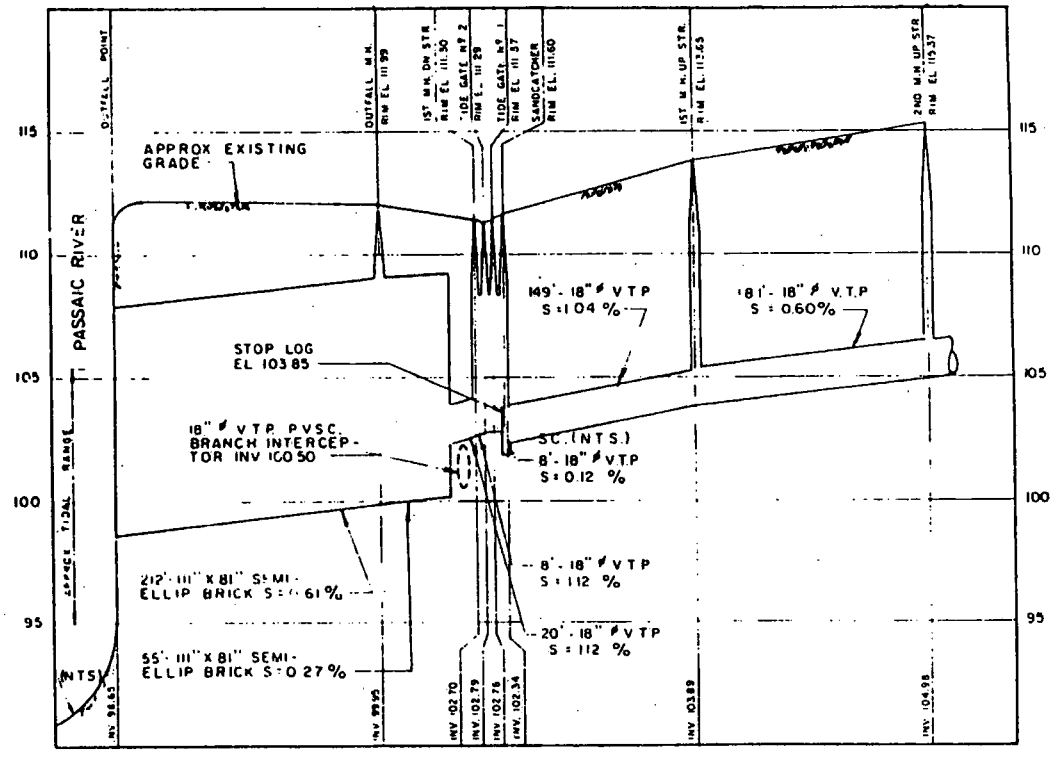
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ SCALE IN FEET

VERT SCALE IN FEET

ALL ELEVATIONS BASED ON B.M. Nº 9660A AS ESTABLISHED BY PAUL J. EMILIUS & ASSOCIATES FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER N-006C

PASSAIC STREET, NEWARK

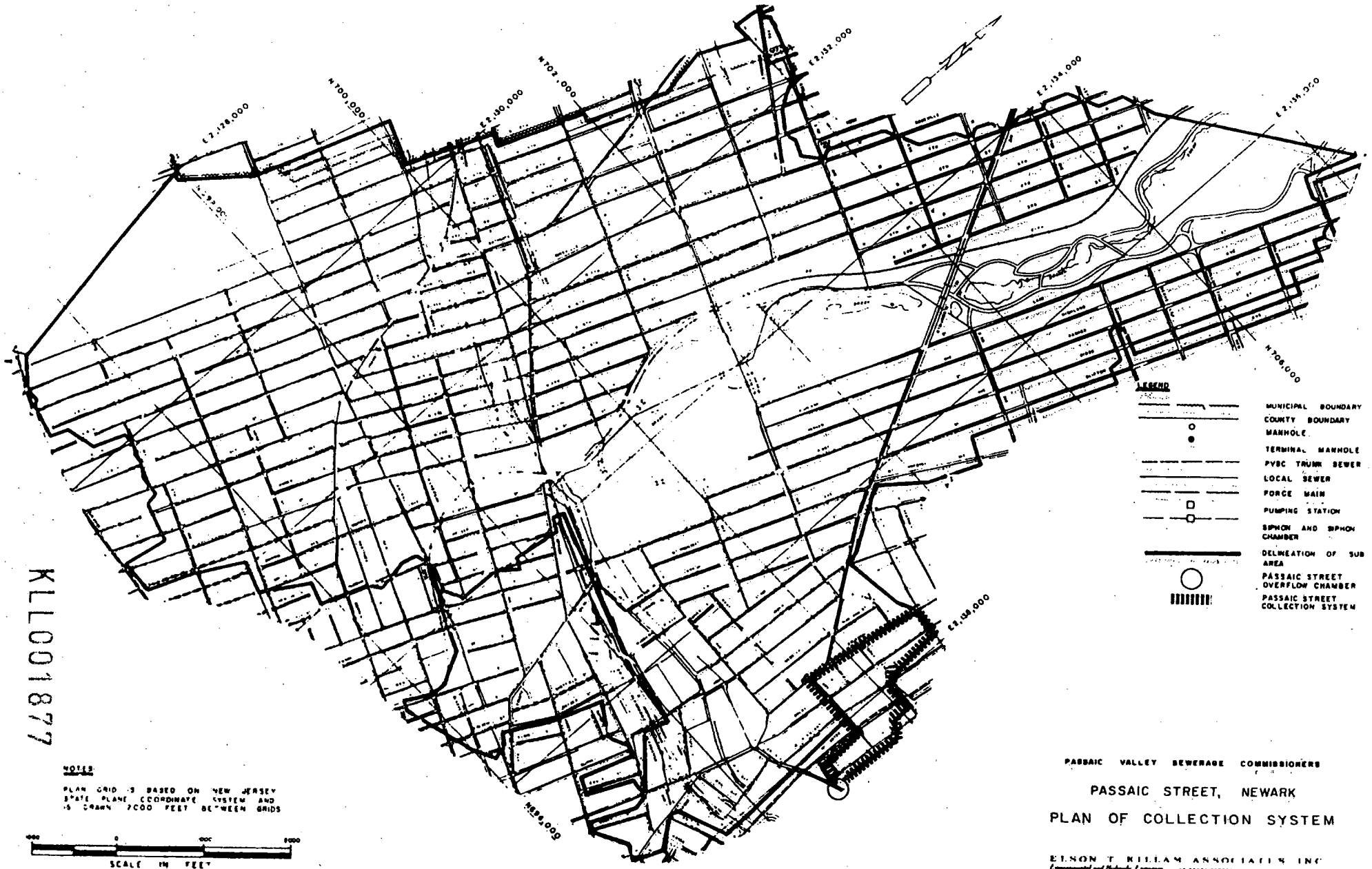
PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

KL10018 76

PLATE A



KLL001877

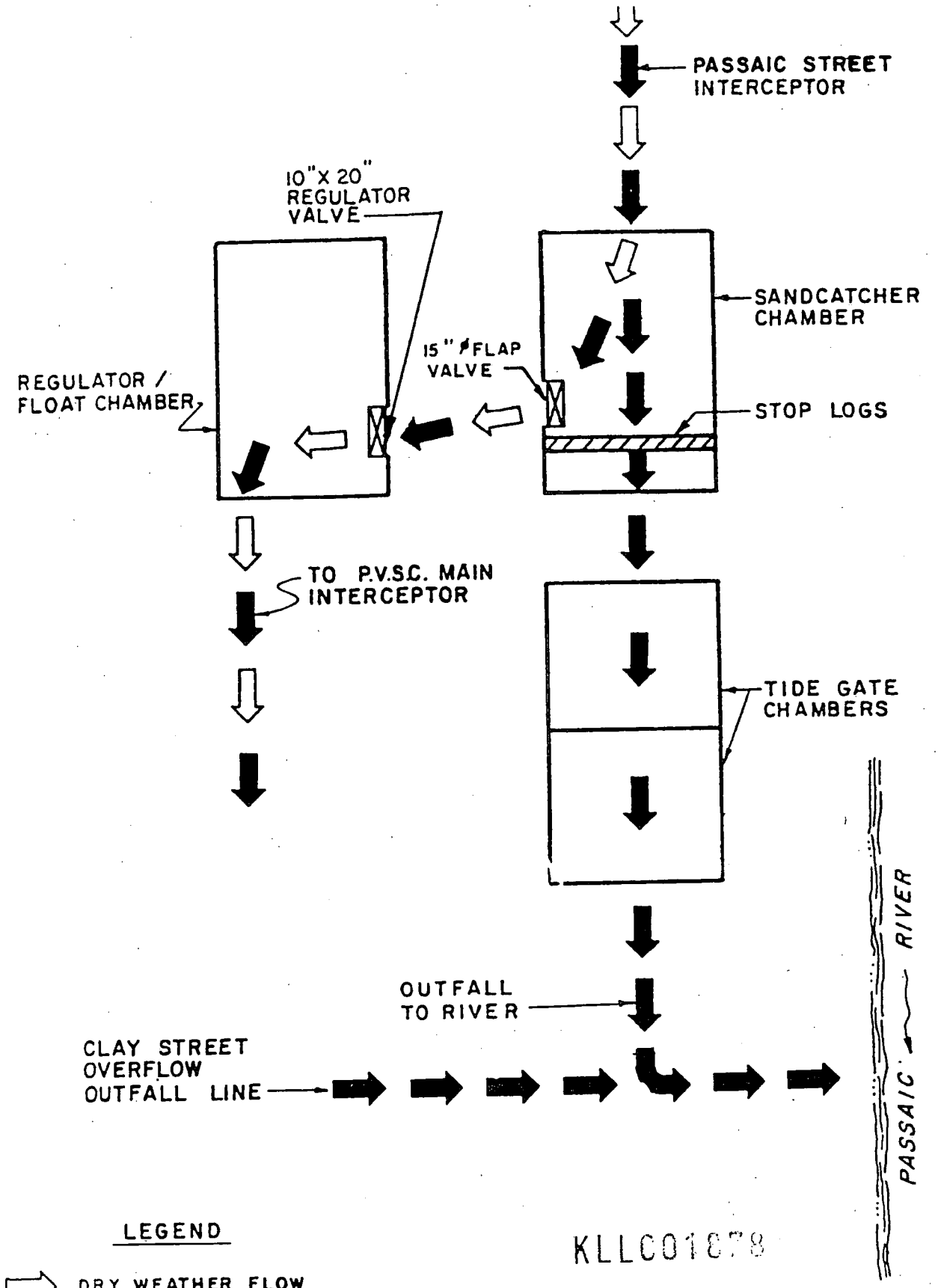
PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC STREET, NEWARK

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE D



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLLC01878

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC STREET, NEWARK

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.

Environmental and Hydraulic Engineers

PLATE C

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

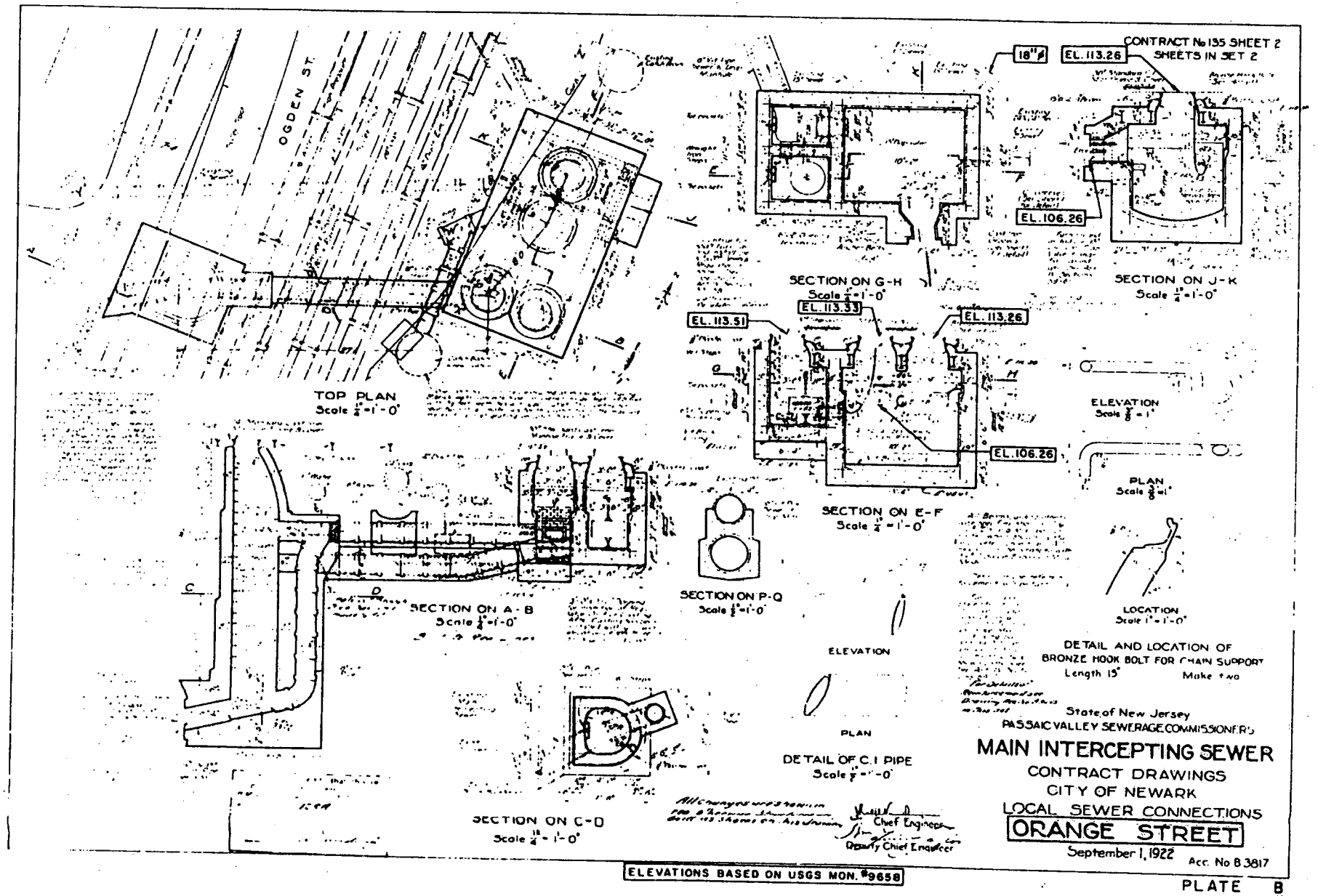
PASSAIC RIVER OVERFLOWS

ORANGE STREET, NEWARK
N-007

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 46 ESSEX STREET MILLBURN NEW JERSEY 07041

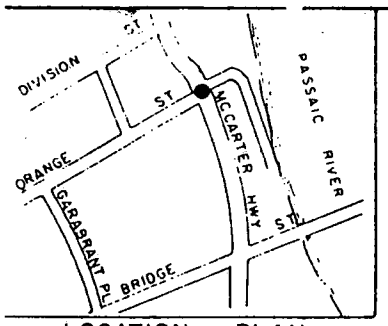
KLL001879



ELEVATIONS BASED ON USGS MON. #9658

PLATE B

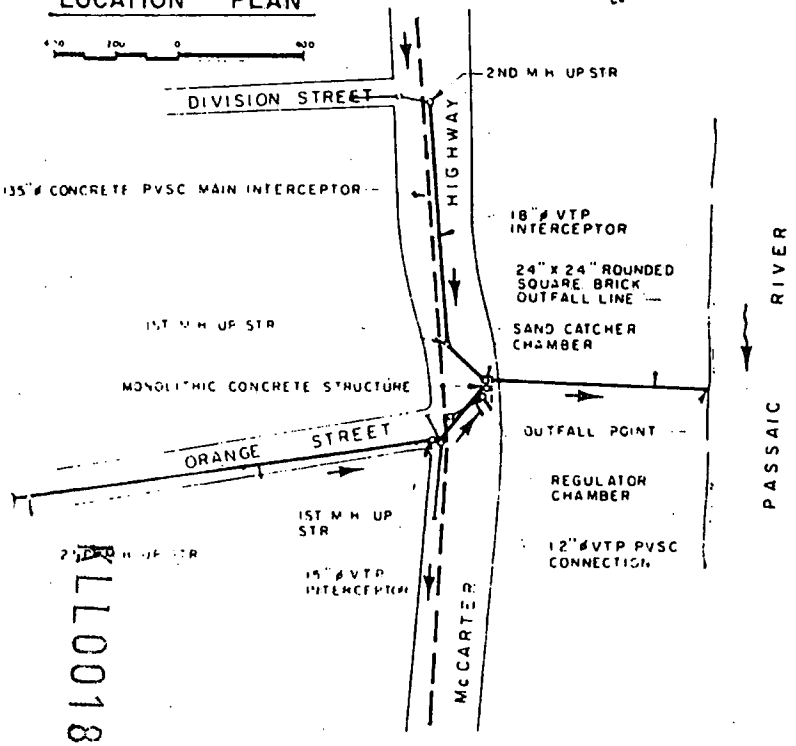
KLL001880



LOCATION PLAN

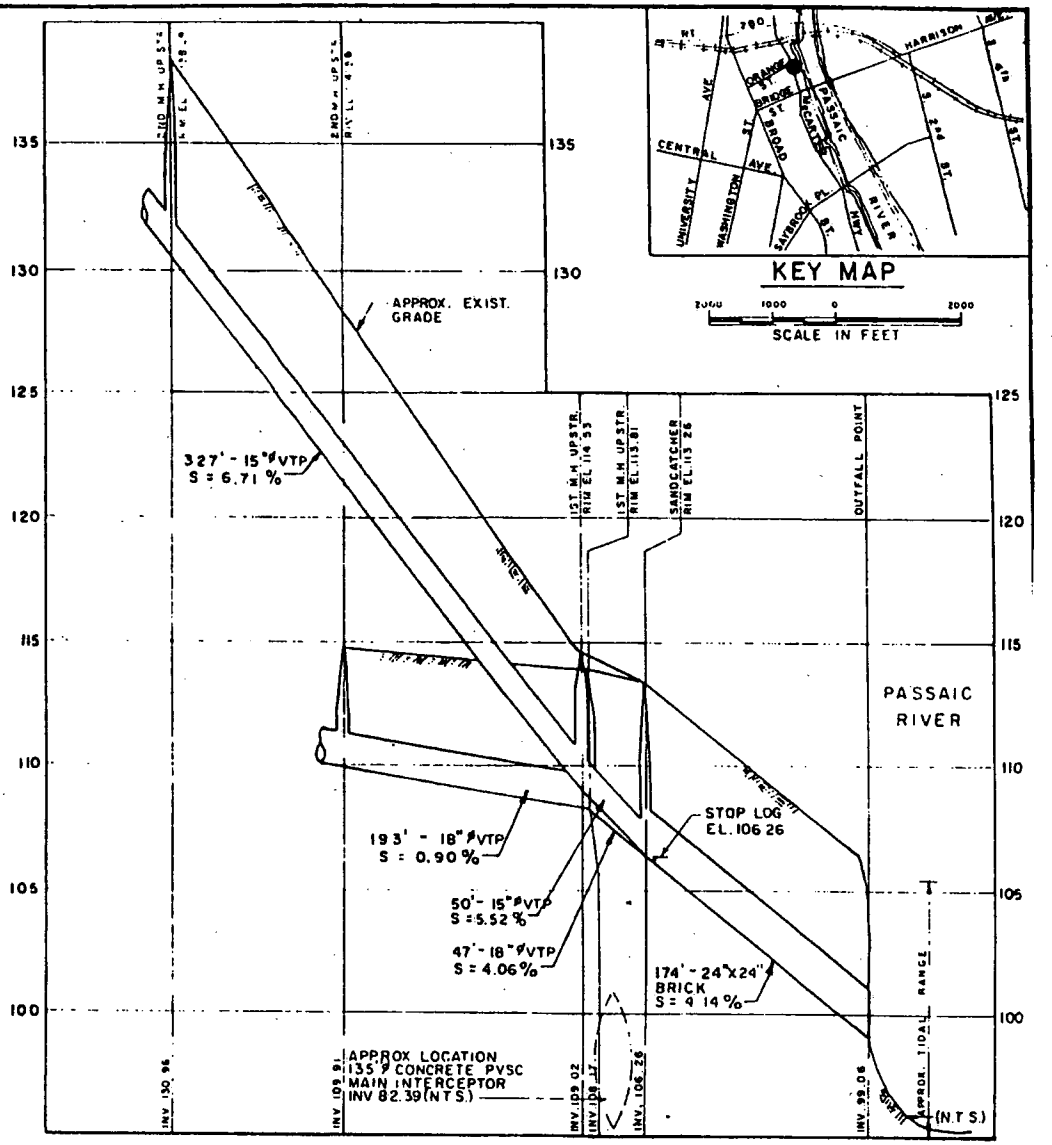
NOTE
ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

LEGEND
→ DIRECTION OF FLOW
S C = SAND CATCHER
T G = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
N.T.S = NOT TO SCALE
V.T.P. = VITRIFIED TILE PIPE
● = OVERFLOW LOCATION



PLAN

SCALE IN FEET



PROFILE

SCALE IN FEET

SCALE IN FEET

KEY MAP

SCALE IN FEET

ALL ELEVATIONS BASED ON NEW JERSEY AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER N-007

ORANGE STREET, NEWARK

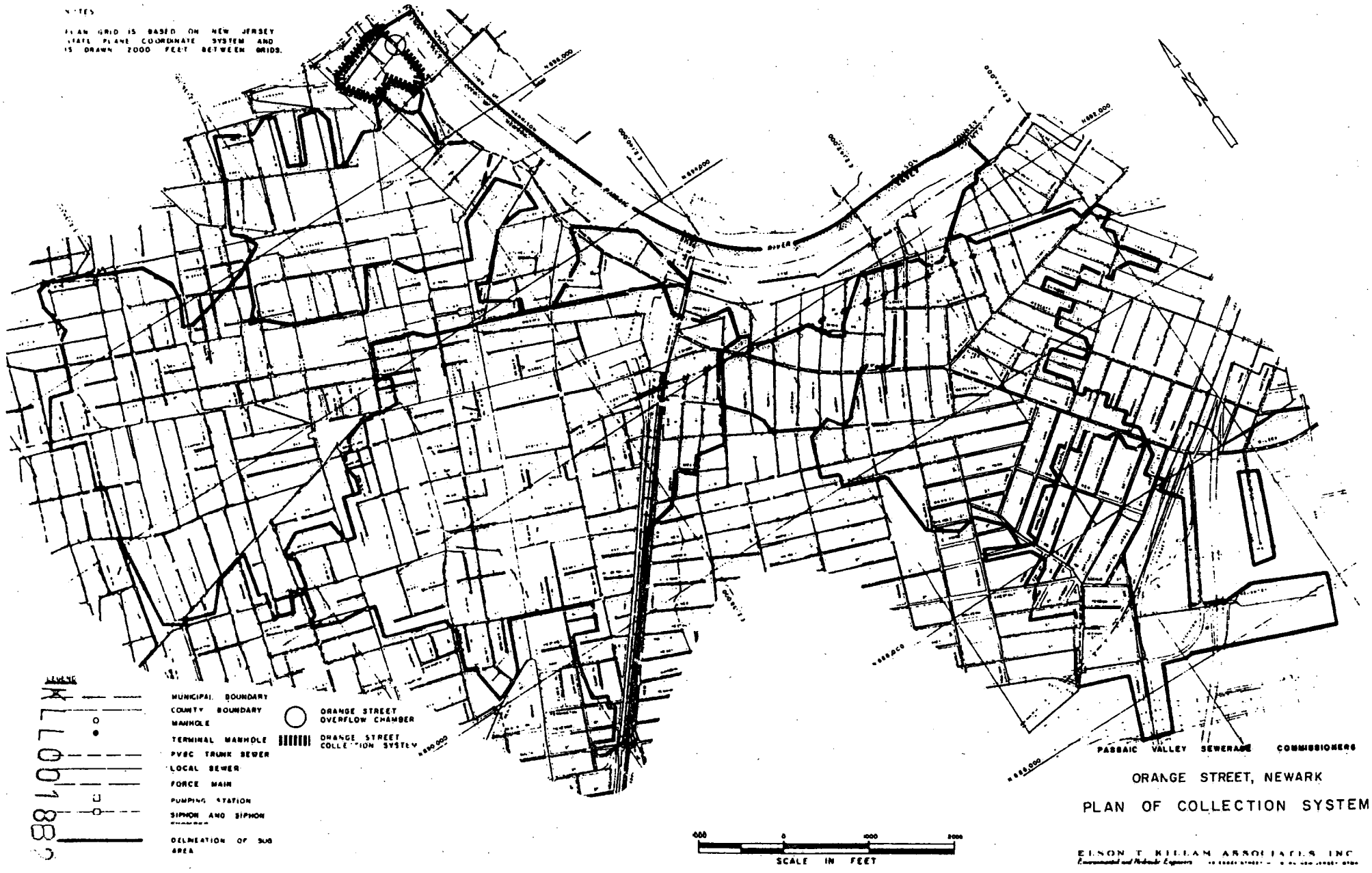
PLAN AND PROFILE

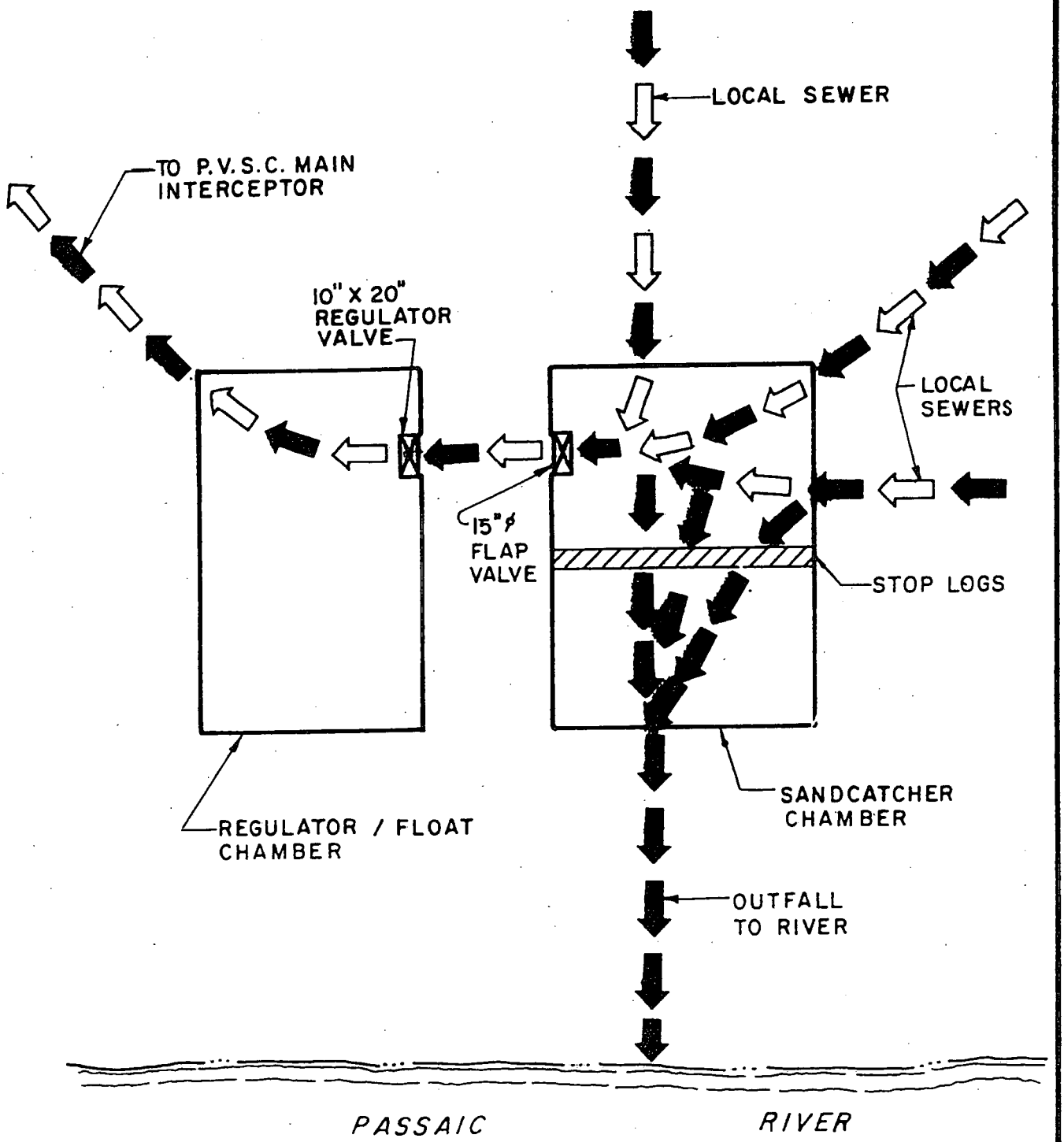
ELSON T. KILLAM ASSOCIATES INC.

Environmental and Hydraulic Engineers

PLATE A

ALL00188


NOTES
PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.
LEGEND
MUNICIPAL BOUNDARY
COUNTY BOUNDARY
MANHOLE
TERMINAL MANHOLE
PVBC TRUNK SEWER
LOCAL SEWER
FORCE MAIN
PUMPING STATION
SIPHON AND SIPHON CHAMBER
DELINEATION OF SUB AREA
ORANGE STREET OVERFLOW CHAMBER
ORANGE STREET COLLECTION SYSTEM
RIVER
SCALE IN FEET
PASSAIC VALLEY SEWERAGE COMMISSIONERS
ORANGE STREET, NEWARK
PLAN OF COLLECTION SYSTEM
ELSON T. KILLAM ASSOCIATES INC
PLATE D



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001863

PASSAIC VALLEY SEWERAGE COMMISSIONERS

ORANGE STREET, NEWARK

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

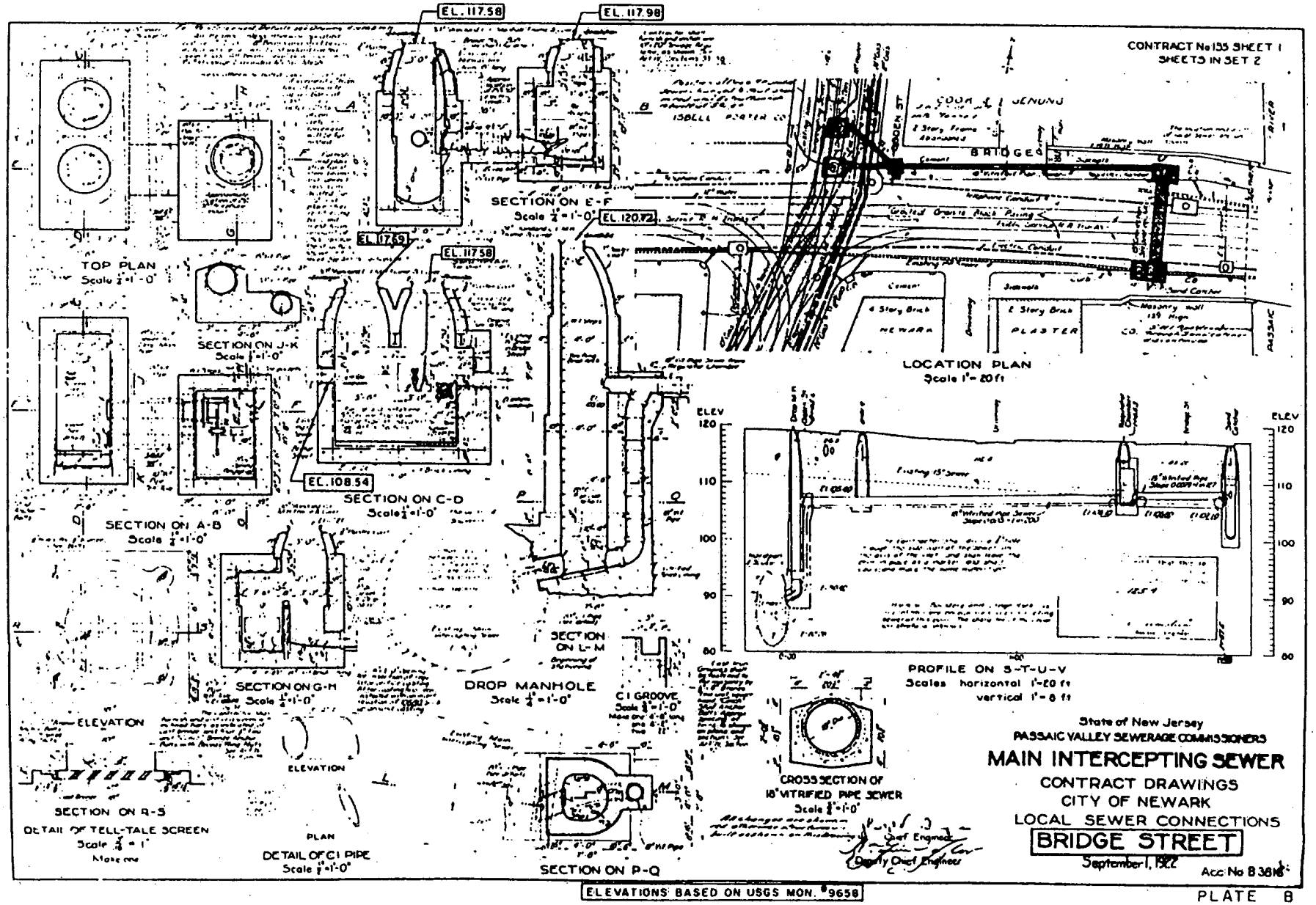
PASSAIC RIVER OVERFLOWS

BRIDGE STREET, NEWARK
N-008

1976

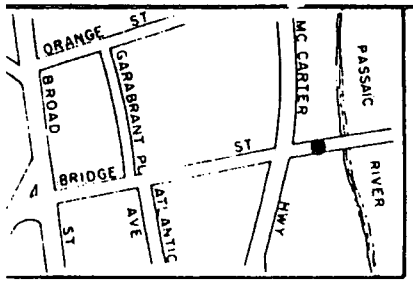
ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL00180


CONTRACT No 155 SHEET 1
SHEETS IN SET 2
EL. 117.58
EL. 117.98
EL. 120.72
EL. 117.69
EL. 117.58
EL. 108.54
TOP PLAN
Scale 1/4"=1'-0"
SECTION ON E-F
Scale 1/4"=1'-0"
SECTION ON J-K
Scale 1/4"=1'-0"
SECTION ON C-D
Scale 1/4"=1'-0"
SECTION ON A-B
Scale 1/4"=1'-0"
SECTION ON G-H
Scale 1/4"=1'-0"
DROP MANHOLE
Scale 1/4"=1'-0"
SECTION ON L-M
C1 GROOVE
Scale 1/4"=1'-0"
ELEVATION
ELEVATION
SECTION ON R-S
DETAIL OF TELL-TALE SCREEN
Scale 1/4"=1"
PLAN
DETAIL OF C1 PIPE
Scale 1/4"=1'-0"
SECTION ON P-Q
LOCATION PLAN
Scale 1"=20 ft
BRIDGE
PROFILE ON S-T-U-V
Scales horizontal 1"=20 ft
vertical 1"=6 ft
CROSS SECTION OF
18" VITRIFIED PIPE SEWER
Scale 1/4"=1'-0"
Chief Engineer
Deputy Chief Engineer
State of New Jersey
PASSAIC VALLEY SEWERAGE COMMISSIONERS
MAIN INTERCEPTING SEWER
CONTRACT DRAWINGS
CITY OF NEWARK
LOCAL SEWER CONNECTIONS
BRIDGE STREET
September 1, 1922
Acc No 8 38 18
ELEVATIONS BASED ON USGS MON. #9658
PLATE 8

(3)

KLL001885

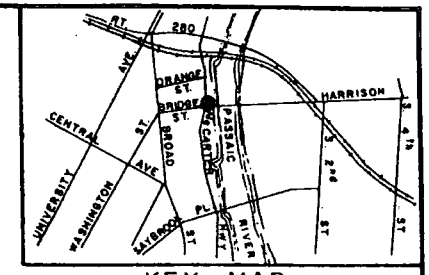


LOCATION PLAN

SCALE IN FEET

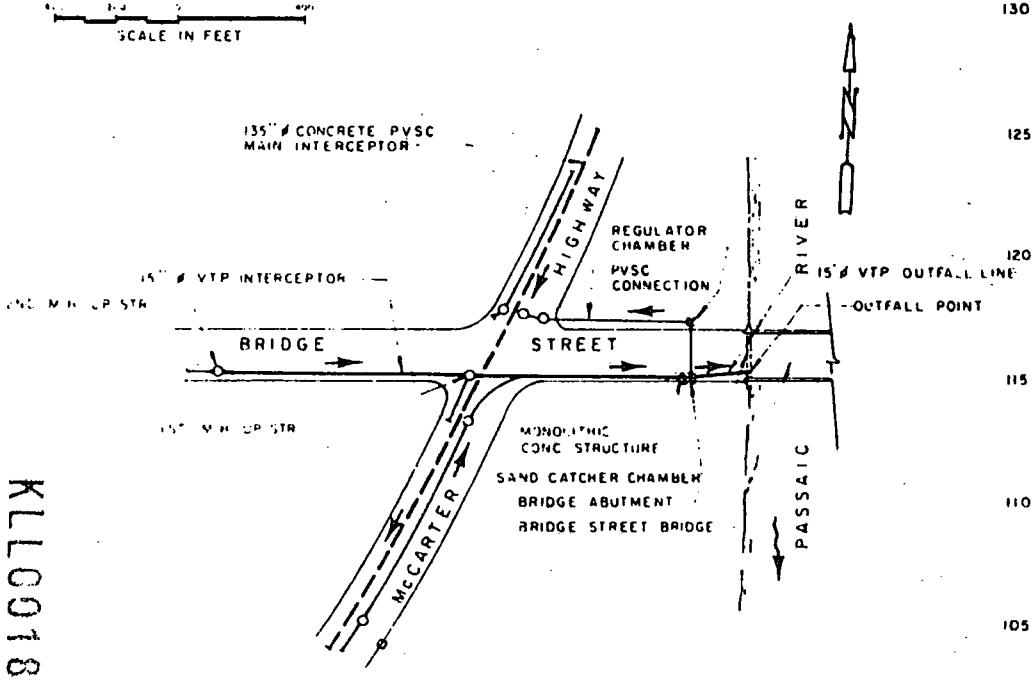
NOTE
ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

LEGEND
→ DIRECTION OF FLOW
SC. : SAND CATCHER
TG : TIDE GATE
UP STR : UP STREAM
DN STR : DOWN STREAM
NTS : NOT TO SCALE
VTP : VITRIFIED TILE PIPE
● : OVERFLOW LOCATION



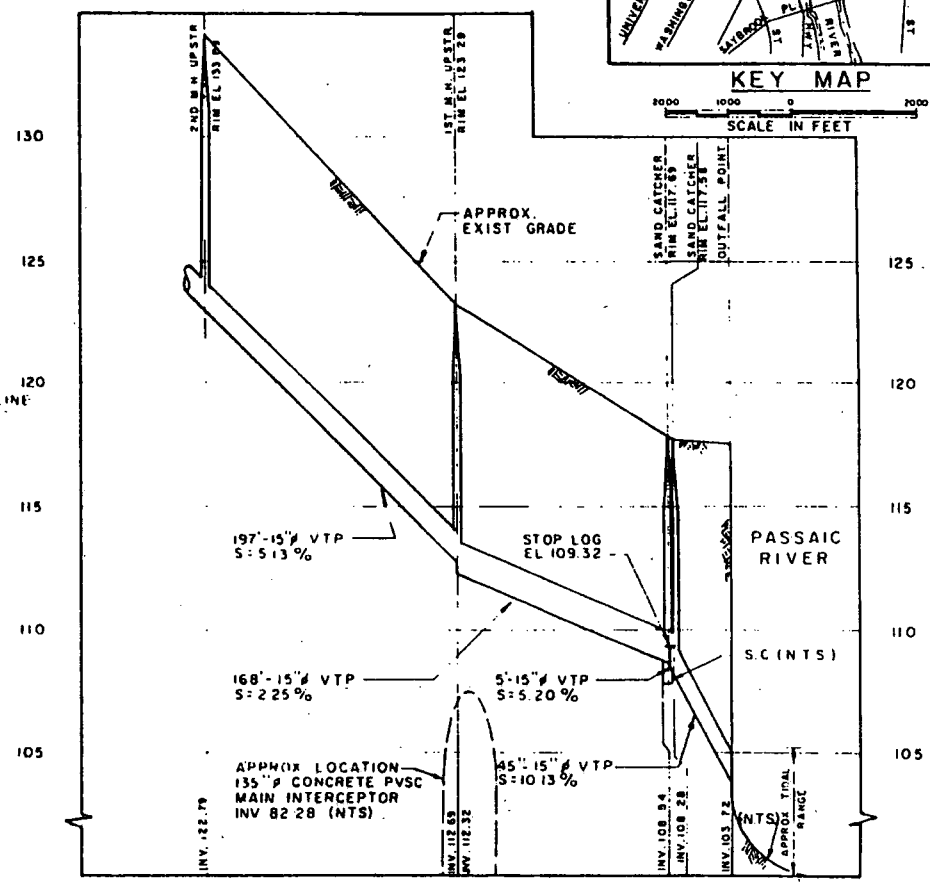
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ SCALE IN FEET

VERT. SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS
OVERFLOW CHAMBER N-008
BRIDGE STREET, NEWARK

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

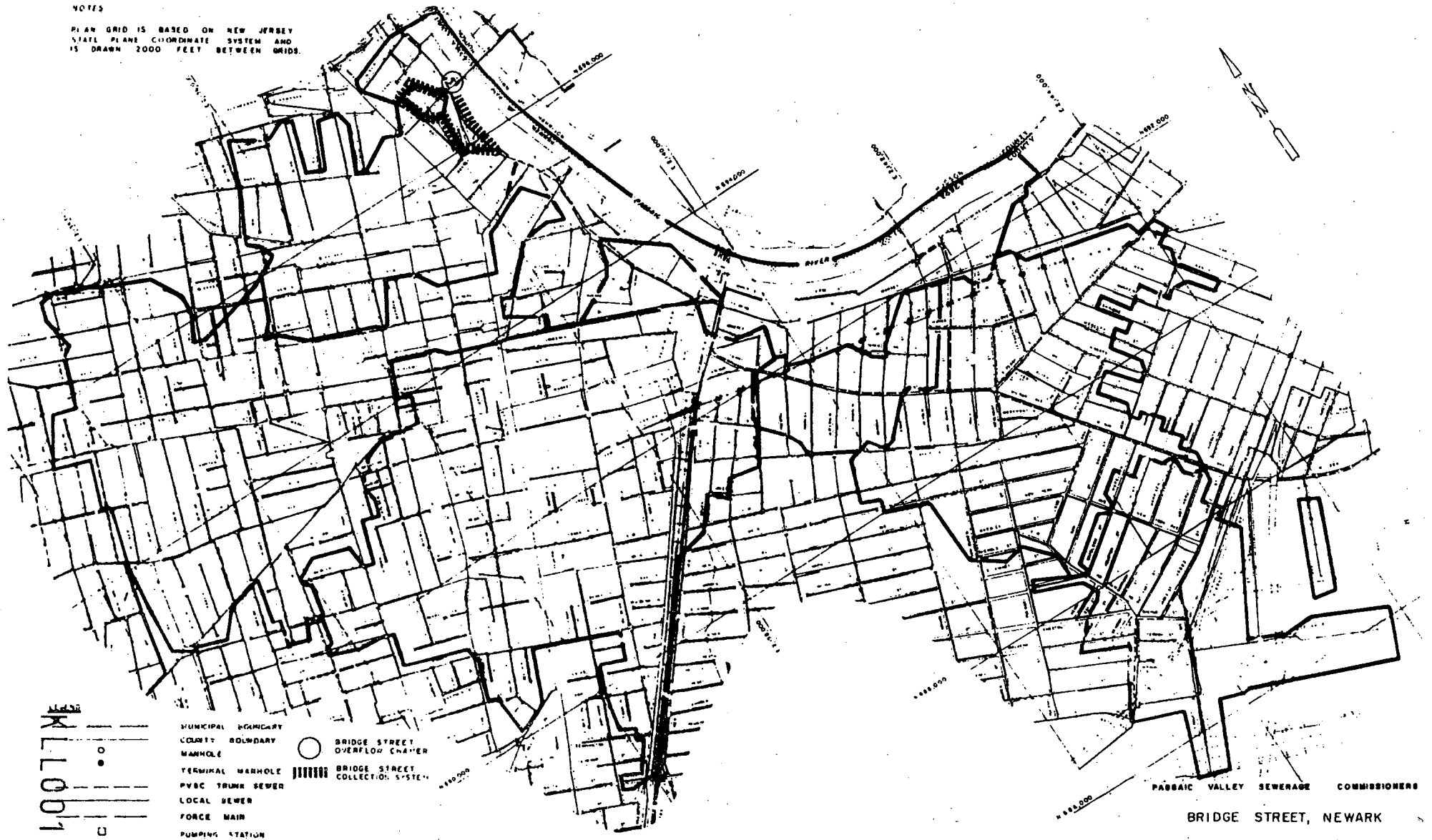
PLATE A

KLL001806

...L ELEVATIONS BASED ON
...M NF9698 AS ESTABLISHED BY
...EW JERSEY GEODETIC CONTROL SURVEY
...OR LOCATION AND DESCRIPTION
...EE APPENDIX.

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.



PASSAIC VALLEY SEWERAGE COMMISSIONERS

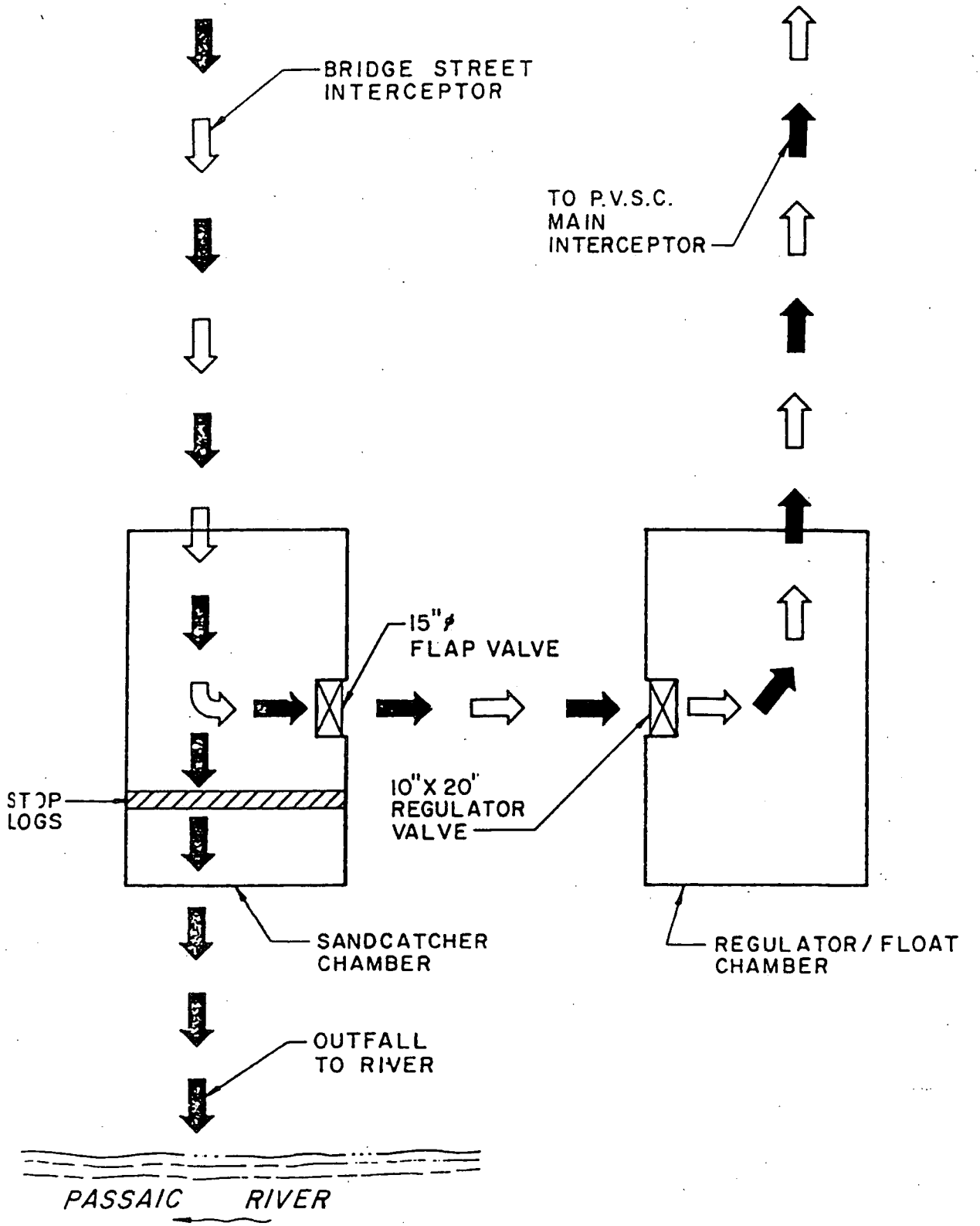
BRIDGE STREET, NEWARK

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE D

KLL00187



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001868

PASSAIC VALLEY SEWERAGE COMMISSIONERS

BRIDGE STREET, NEWARK

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC

PLATE C

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC RIVER OVERFLOWS

RECTOR STREET, NEWARK
N-009

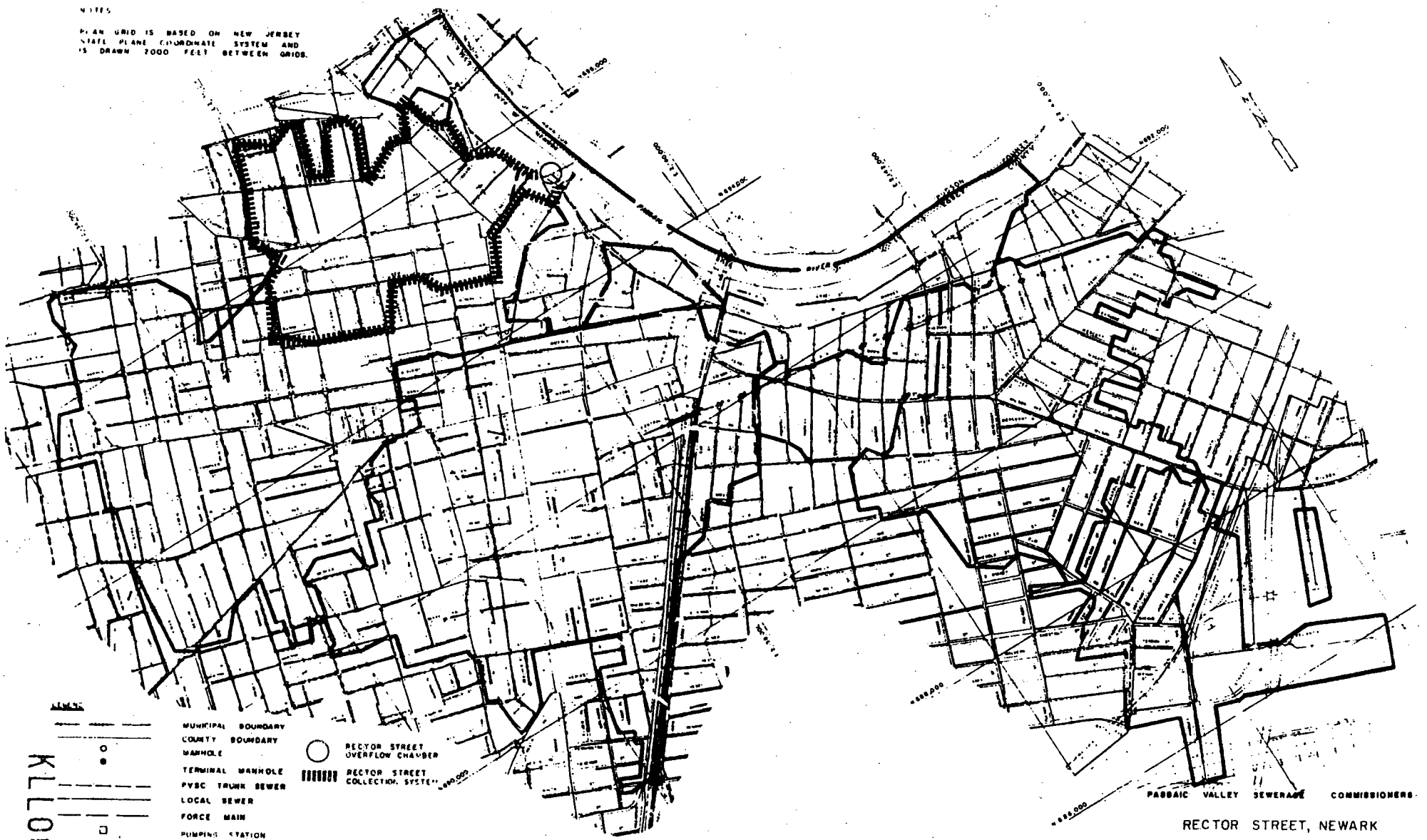
1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 40 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001880

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.



KEY

- MUNICIPAL BOUNDARY
- COUNTY BOUNDARY
- MANHOLE
- TERMINAL MANHOLE
- PVSC TRUNK SEWER
- LOCAL SEWER
- FORCE MAIN
- PUMPING STATION
- SIPHON AND SIPHON CHAMBER
- DELINEATION OF SUB AREA
- RECTOR STREET OVERFLOW CHAMBER
- RECTOR STREET COLLECTION SYSTEM

SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

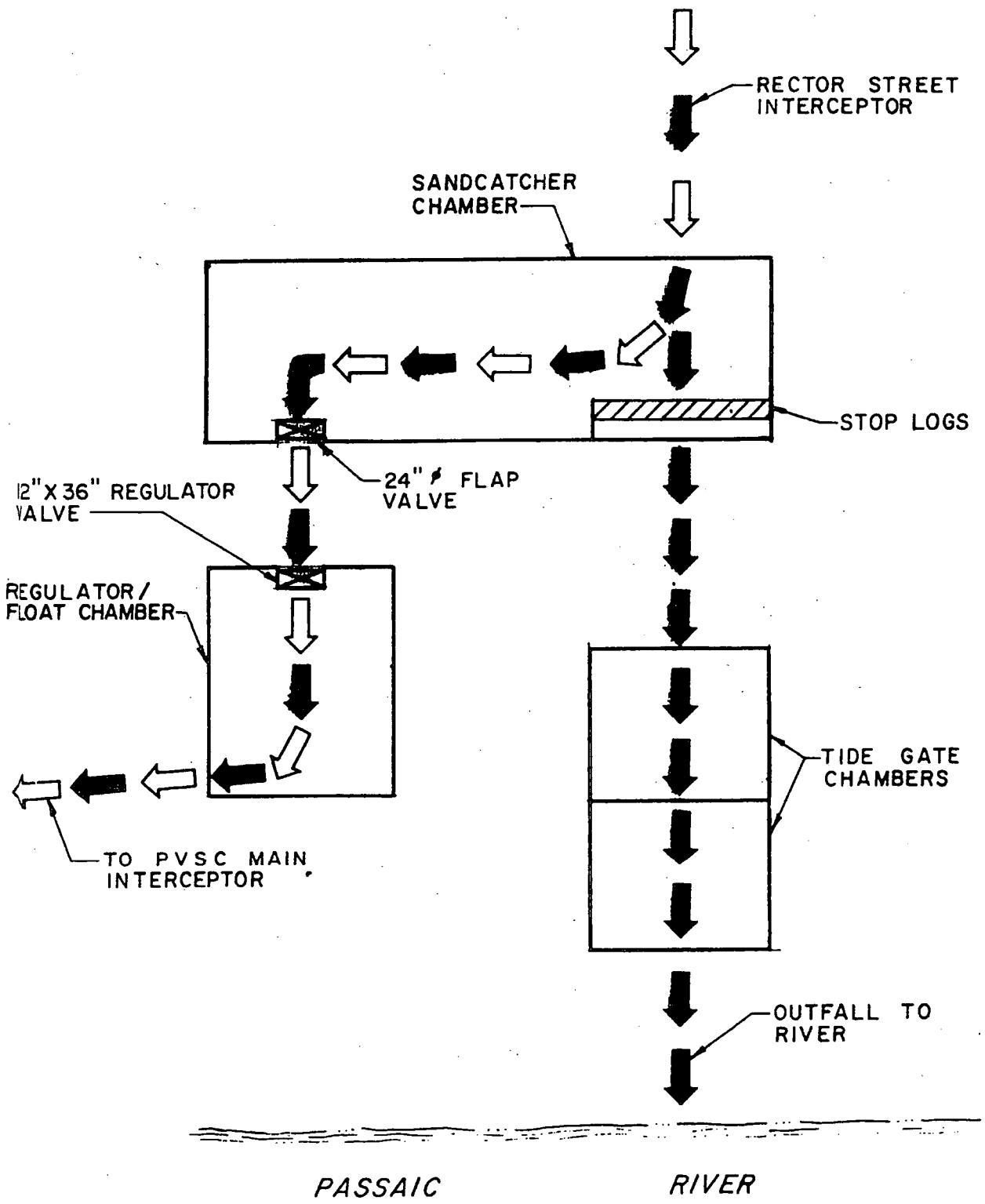
RECTOR STREET, NEWARK

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.

PLATE D

KL00018030



KLL001891

LEGEND

DRY WEATHER FLOW

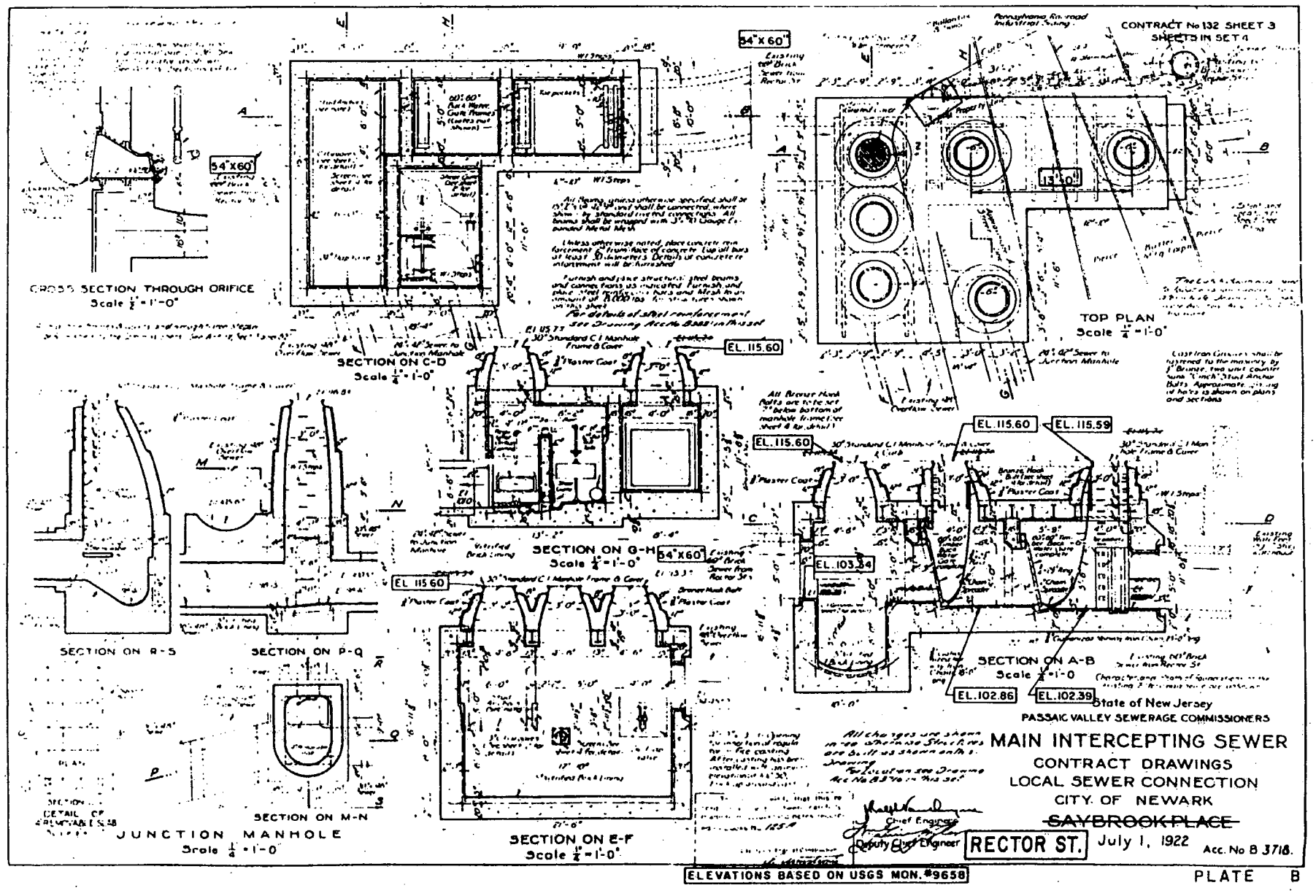
STORM FLOW / OVERFLOW

PASSAIC VALLEY SEWERAGE COMMISSIONERS

RECTOR STREET, NEWARK

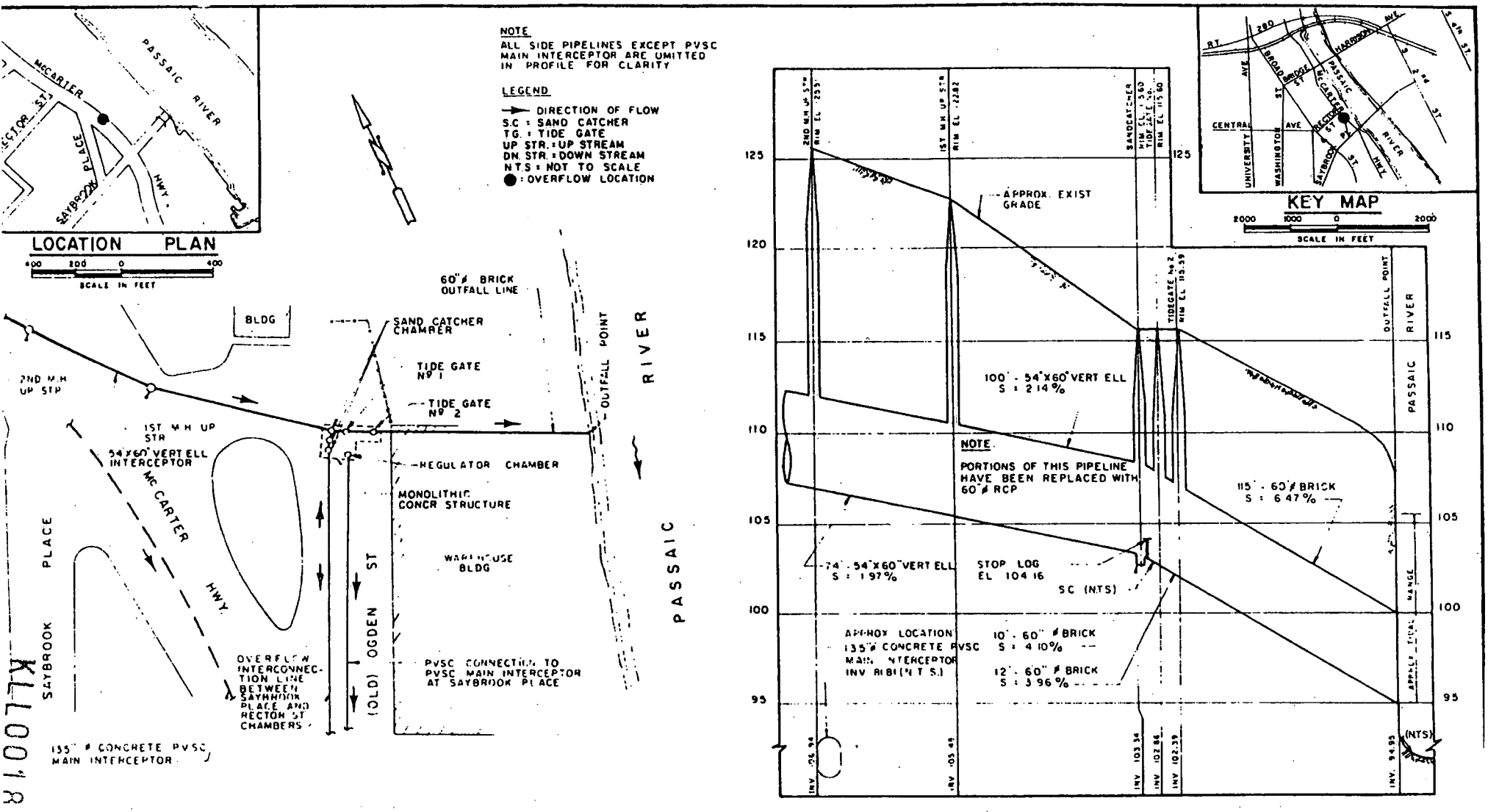
SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC


CONTRACT No 132 SHEET 3
SHEETS IN SET 4
CROSS SECTION THROUGH ORIFICE
Scale 1/2" = 1'-0"
SECTION ON C-D
Scale 1/4" = 1'-0"
TOP PLAN
Scale 1/4" = 1'-0"
SECTION ON G-H
Scale 1/4" = 1'-0"
SECTION ON A-B
Scale 1/4" = 1'-0
SECTION ON R-S
SECTION ON P-Q
SECTION ON M-N
JUNCTION MANHOLE
Scale 1/4" = 1'-0"
SECTION ON E-F
Scale 1/4" = 1'-0"
54"X60"
EL. 115.60
EL. 115.59
EL. 103.34
EL. 102.86
EL. 102.39
13'-0"
State of New Jersey
PASSAIC VALLEY SEWERAGE COMMISSIONERS
MAIN INTERCEPTING SEWER
CONTRACT DRAWINGS
LOCAL SEWER CONNECTION
CITY OF NEWARK
~~SAYBROOK PLACE~~
RECTOR ST.
July 1, 1922
Acc. No B 3718.
Chief Engineer
Deputy Chief Engineer
ELEVATIONS BASED ON USGS MON. #9658
PLATE B

(3)

KLL001899


LOCATION PLAN
SCALE IN FEET
PASSAIC RIVER
MCCARTER HWY
SAYBROOK PLACE
NOTE
ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE UMITTED IN PROFILE FOR CLARITY
LEGEND
DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
N.T.S. = NOT TO SCALE
OVERFLOW LOCATION
60" ø BRICK OUTFALL LINE
BLDG
SAND CATCHER CHAMBER
TIDE GATE Nº 1
TIDE GATE Nº 2
OUTFALL POINT
RIVER
PASSAIC
2ND M.H. UP STR
1ST M.H. UP STR
54"x60" VERT ELL INTERCEPTOR
REGULATOR CHAMBER
MONOLITHIC CONCR STRUCTURE
WAREHOUSE BLDG
(OLD) OGDEN ST
OVERFLOW INTERCONNECTION LINE BETWEEN SAYBROOK PLACE AND RECTOR ST CHAMBERS
PVSC CONNECTION TO PVSC MAIN INTERCEPTOR AT SAYBROOK PLACE
135" ø CONCRETE PVSC MAIN INTERCEPTOR
PLAN
SCALE IN FEET
APPROX. EXIST GRADE
100' - 54"x60" VERT ELL S = 2.14%
NOTE
PORTIONS OF THIS PIPELINE HAVE BEEN REPLACED WITH 60" ø RCP
115' - 60" ø BRICK S = 6.47%
74' - 54"x60" VERT ELL S = 1.97%
STOP LOG EL 104.16
SC (NTS)
APPROX LOCATION 135" ø CONCRETE PVSC MAIN INTERCEPTOR INV 81.81 (N.T.S.)
10' - 60" ø BRICK S = 4.10%
12' - 60" ø BRICK S = 3.96%
PROFILE
HORIZONTAL
VERTICAL
SCALE IN FEET
KEY MAP
SCALE IN FEET
CENTRAL AVE
UNIVERSITY AVE
WASHINGTON ST
BROAD ST
BRIDGE ST
MCCARTER HWY
RECTOR ST
SAYBROOK PL
PASSAIC RIVER
HARBOR AVE
ALL ELEVATIONS BASED ON B.M. NY 9655 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX
PASSAIC VALLEY SEWERAGE COMMISSIONER
OVERFLOW CHAMBER N-009
RECTOR STREET, NEWARK
PLAN AND PROFILE
ELSON T. KILLAM ASSOCIATES, INC.
PLATE A

K1100 1892

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

PASSAIC RIVER OVERFLOWS

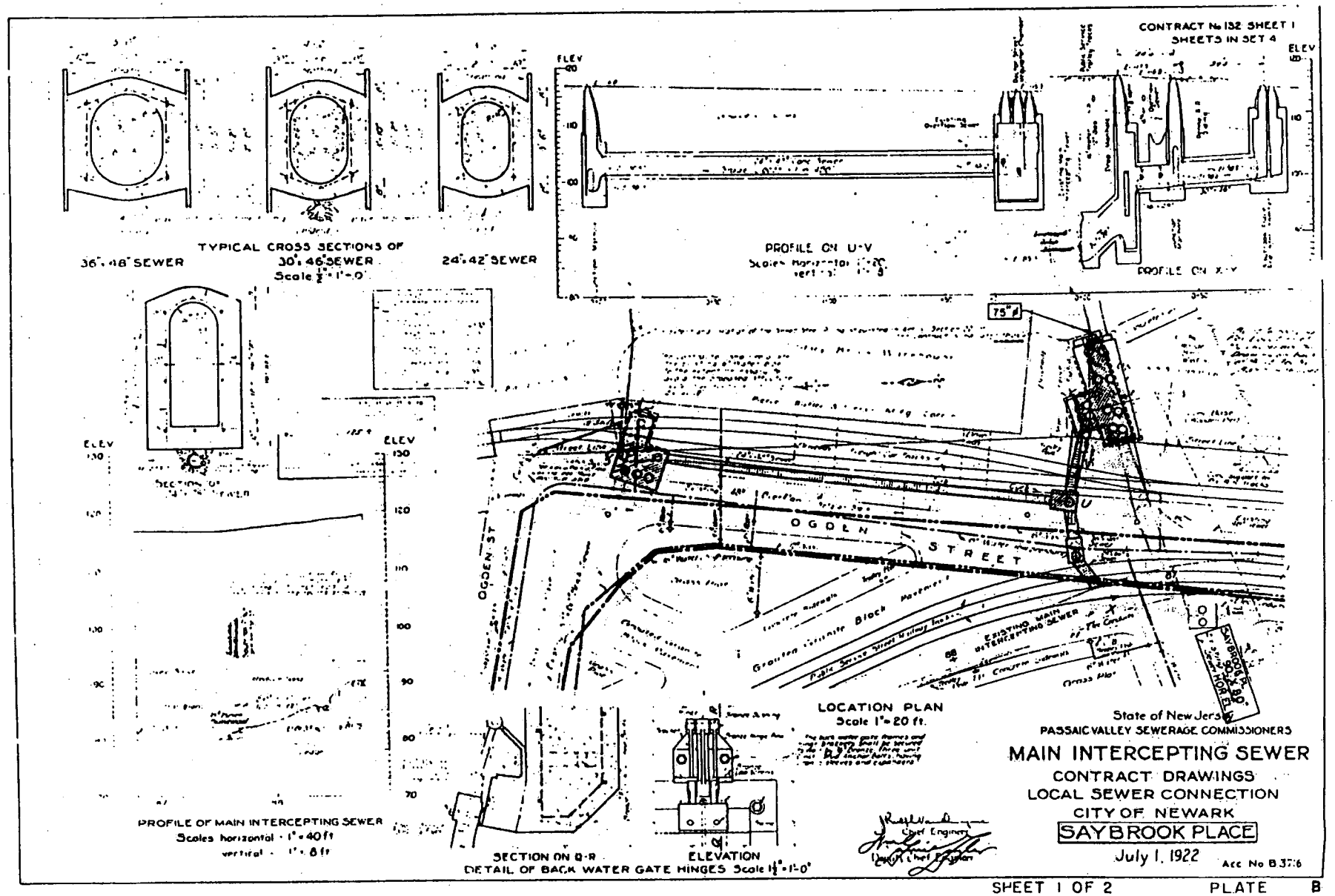
SAYBROOK PLACE, NEWARK

N-010

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

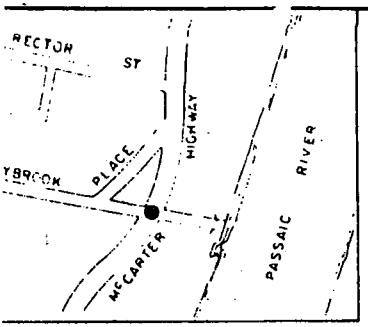
KLL001894



SHEET 1 OF 2 PLATE B

(3A)

KLL001836

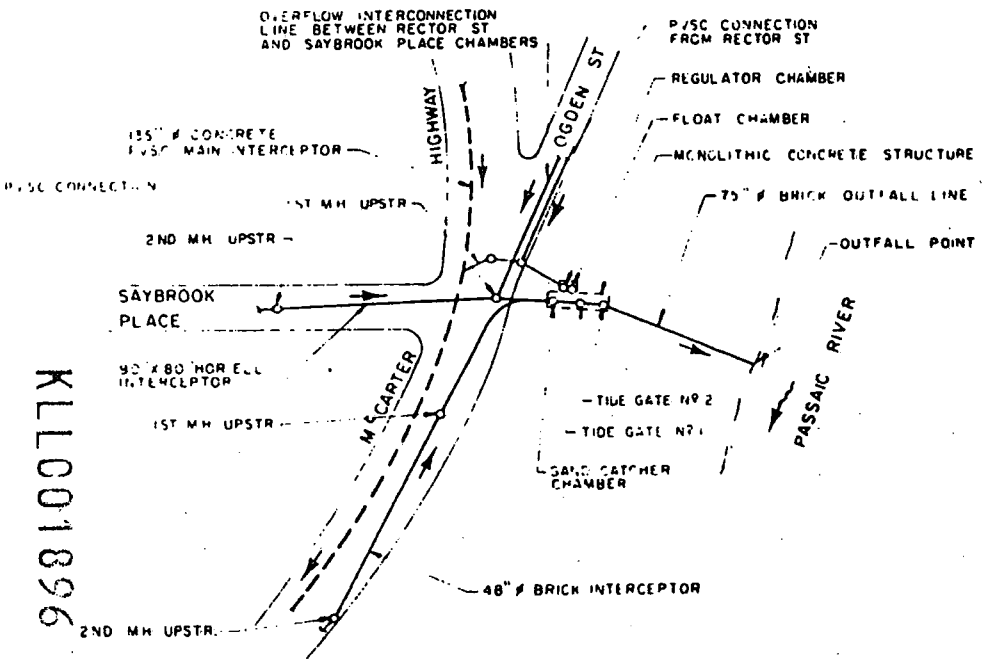


LOCATION PLAN

SCALE IN FEET

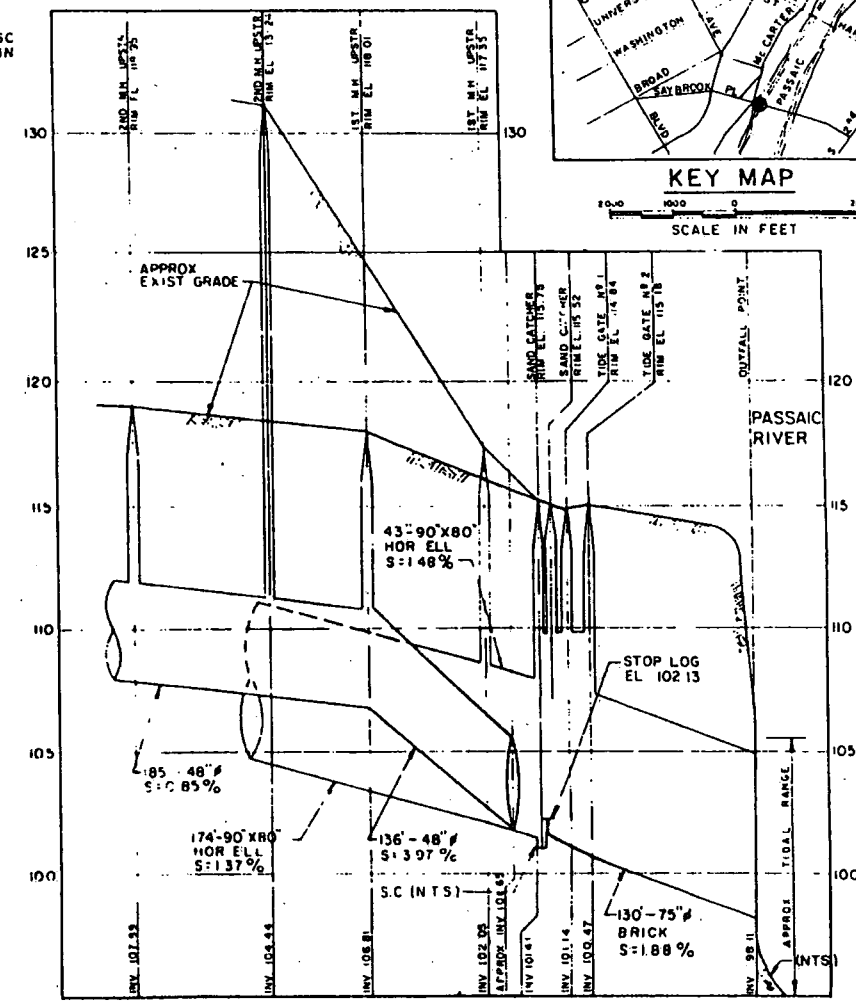
NOTE:
ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

LEGEND
→ DIRECTION OF FLOW
SC : SAND CATCHER
TG : TIDE GATE
UP STR : UP STREAM
DN STR : DOWN STREAM
NTS : NOT TO SCALE
● : OVERFLOW LOCATION



PLAN

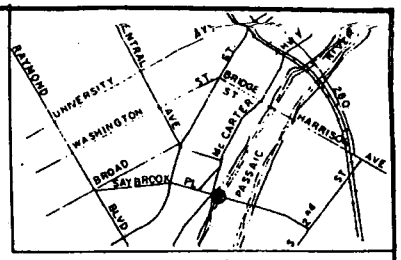
SCALE IN FEET



PROFILE

HORIZ SCALE IN FEET

VERT. SCALE IN FEET



KEY MAP

SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER N-010

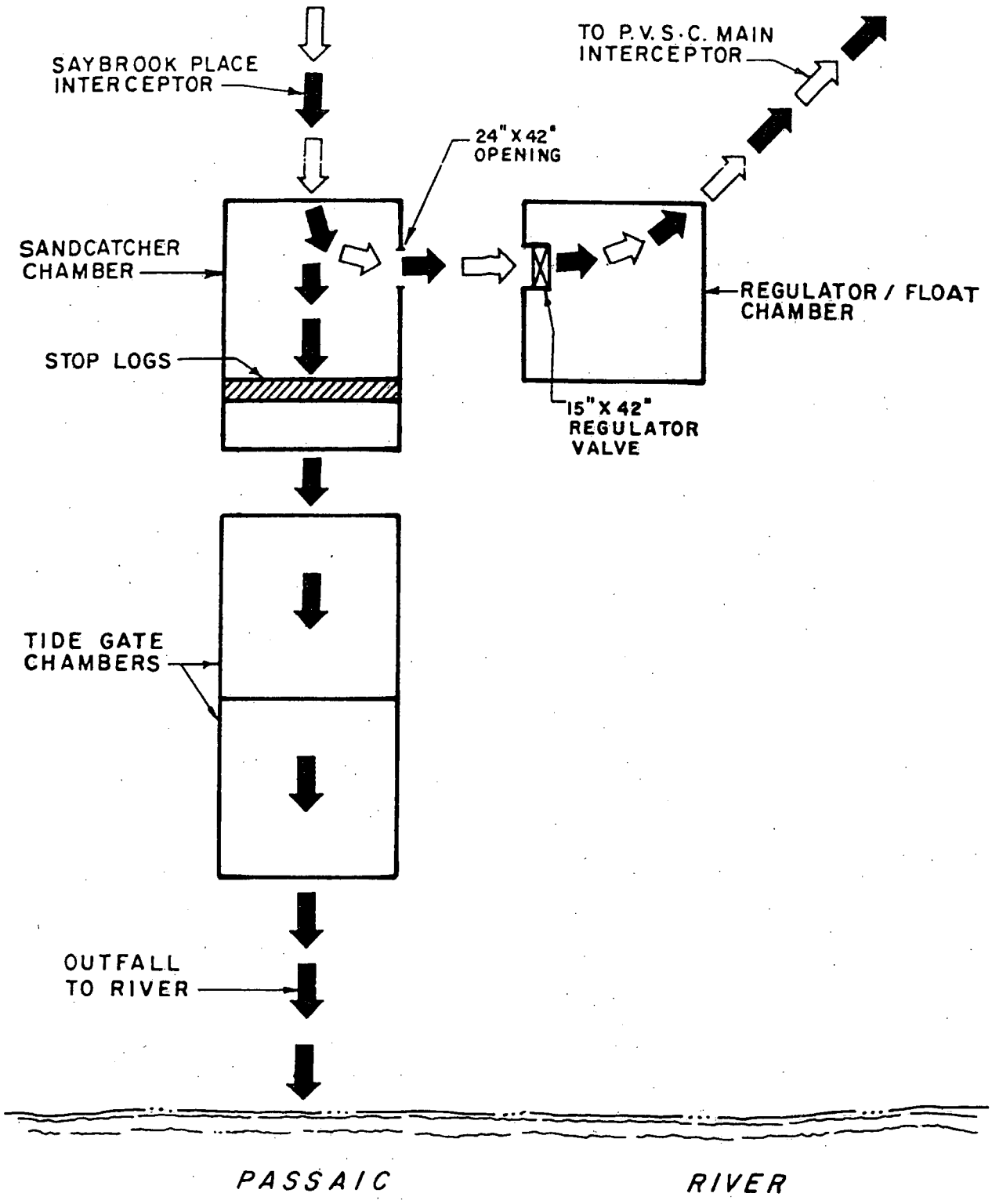
SAYBROOK PLACE, NEWARK

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES INC.

PLATE A

KLL001896



LEGEND

DRY WEATHER FLOW

STORM FLOW / OVERFLOW

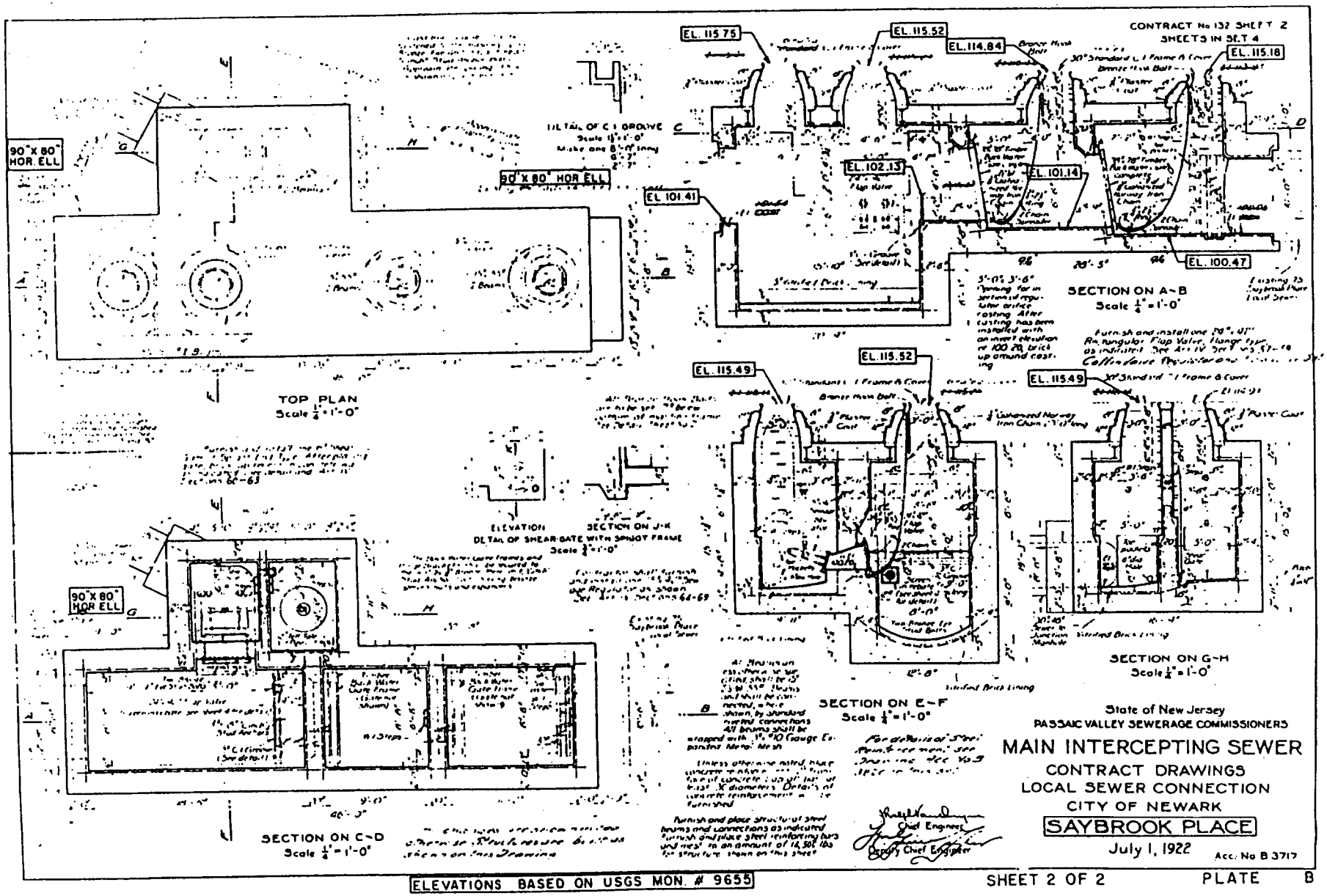
KLL001897

PASSAIC VALLEY SEWERAGE COMMISSIONERS

SAYBROOK PLACE, NEWARK

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers



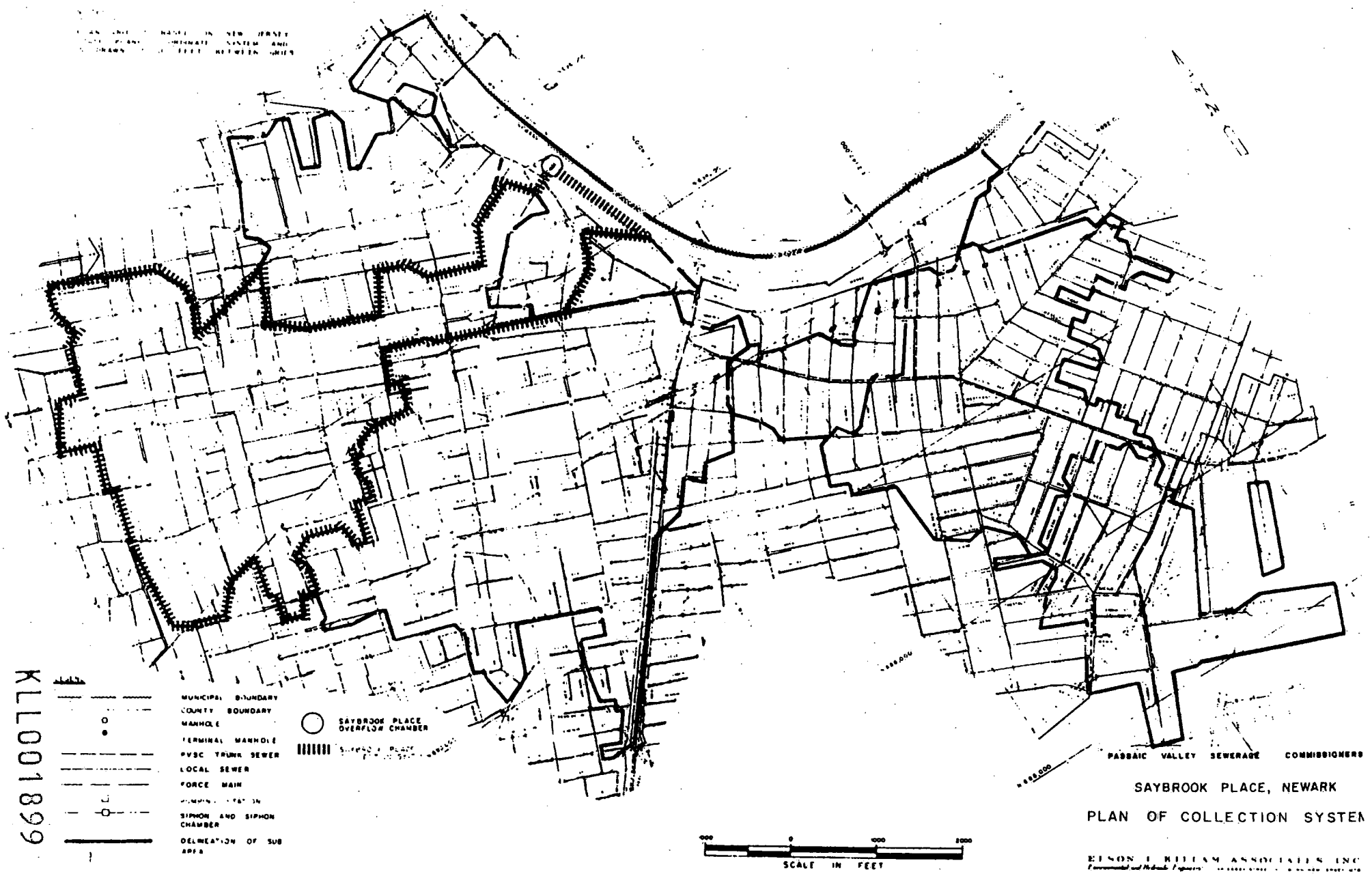
ELEVATIONS BASED ON USGS MON. # 9655

SHEET 2 OF 2

PLATE B

KLL001828

(3B)



PASSAIC VALLEY SEWERAGE COMMISSIONERS

SAYBROOK PLACE, NEWARK

PLAN OF COLLECTION SYSTEM

ELSON T. KILHAM ASSOCIATES INC

PLATE

KLL001899

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

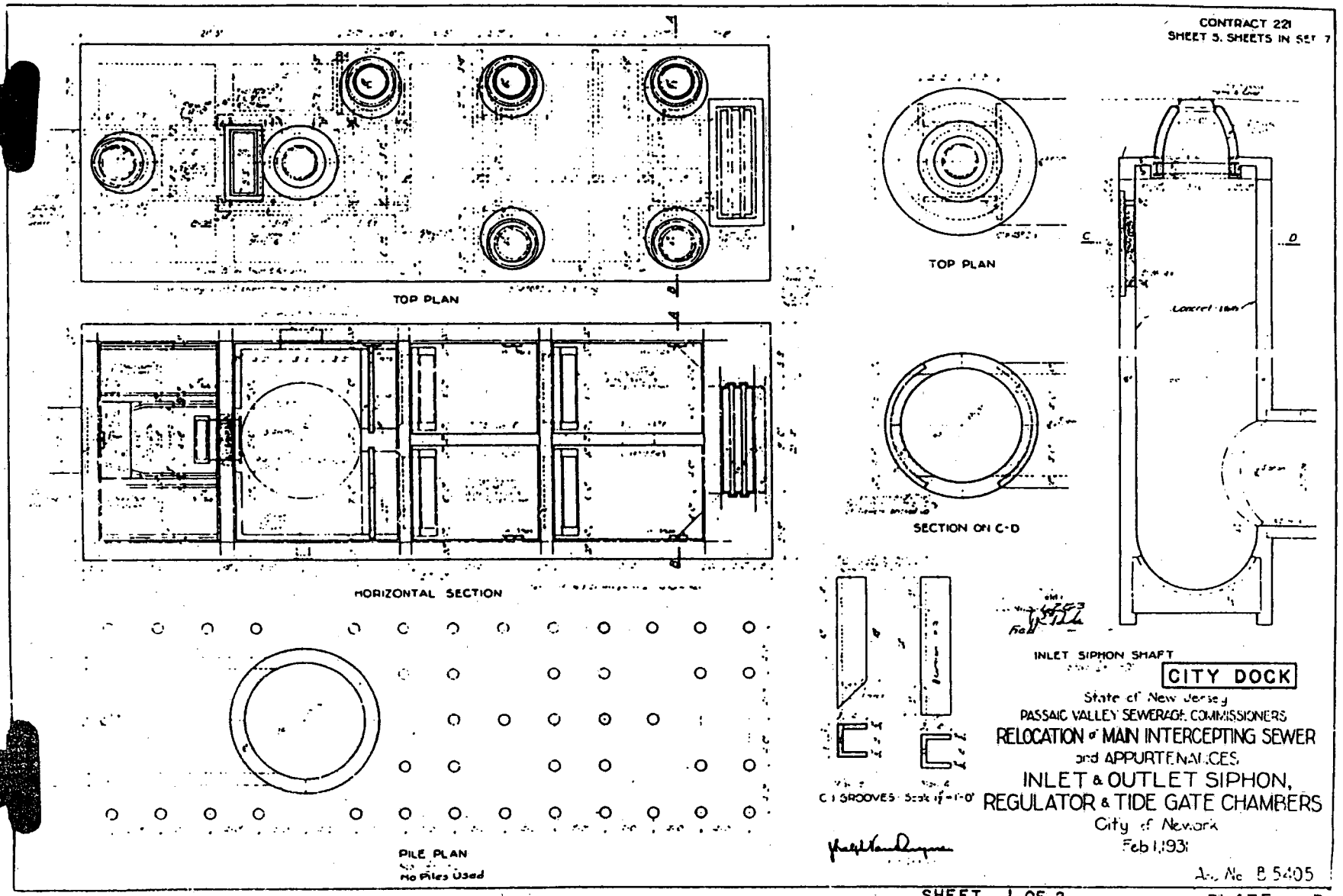
PASSAIC RIVER OVERFLOWS

CITY DOCK, NEWARK
N-011

1976

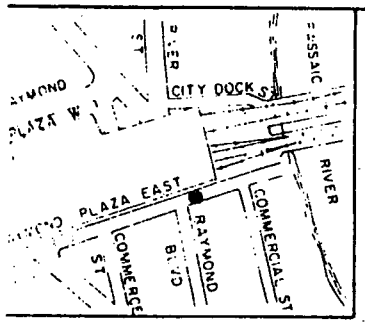
ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

KLL001900



(3A)

KLL001901

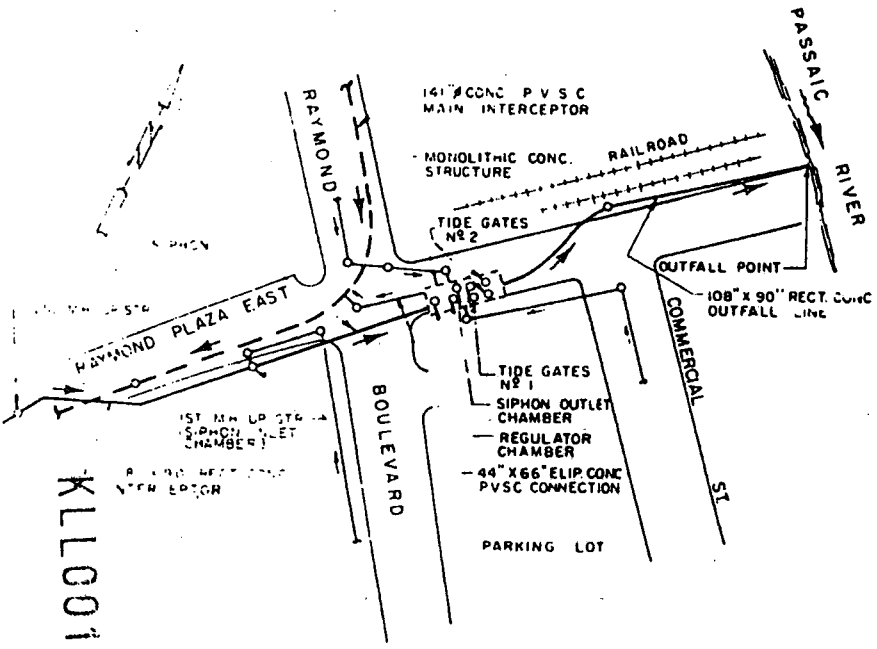


LOCATION PLAN

SCALE IN FEET

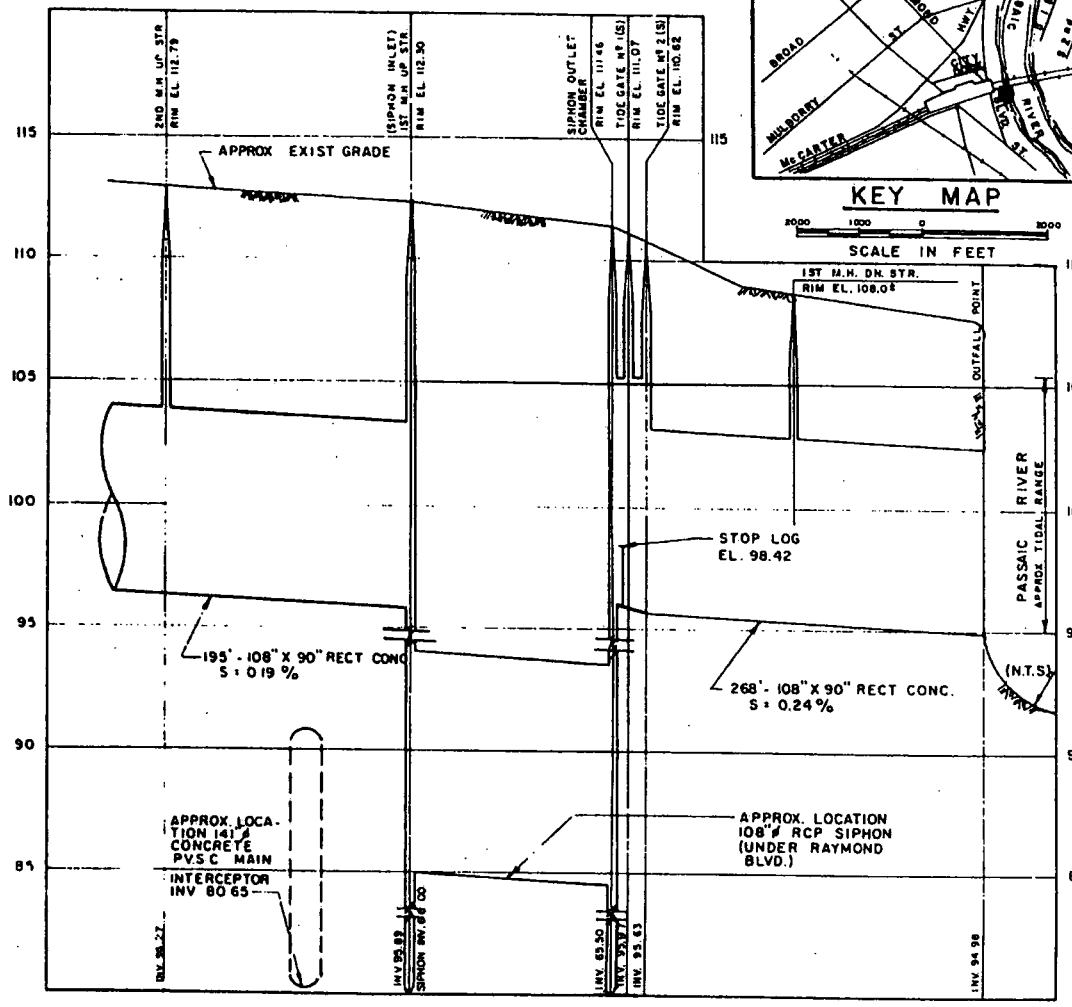
NOTE:
ALL SIDE PIPELINES EXCEPT PVSC MAIN INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

LEGEND:
DIRECTION OF FLOW
S.C.: SAND CATCHER
T.G.: TIDE GATE
UP STR.: UP STREAM
DN. STR.: DOWN STREAM
NTS.: NOT TO SCALE
●: OVERFLOW LOCATION



PLAN

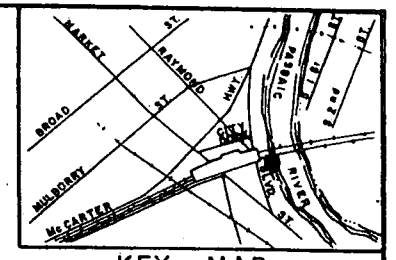
SCALE IN FEET



PROFILE

HORIZ SCALE IN FEET

VERT. SCALE IN FEET



KEY MAP

SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER N-011

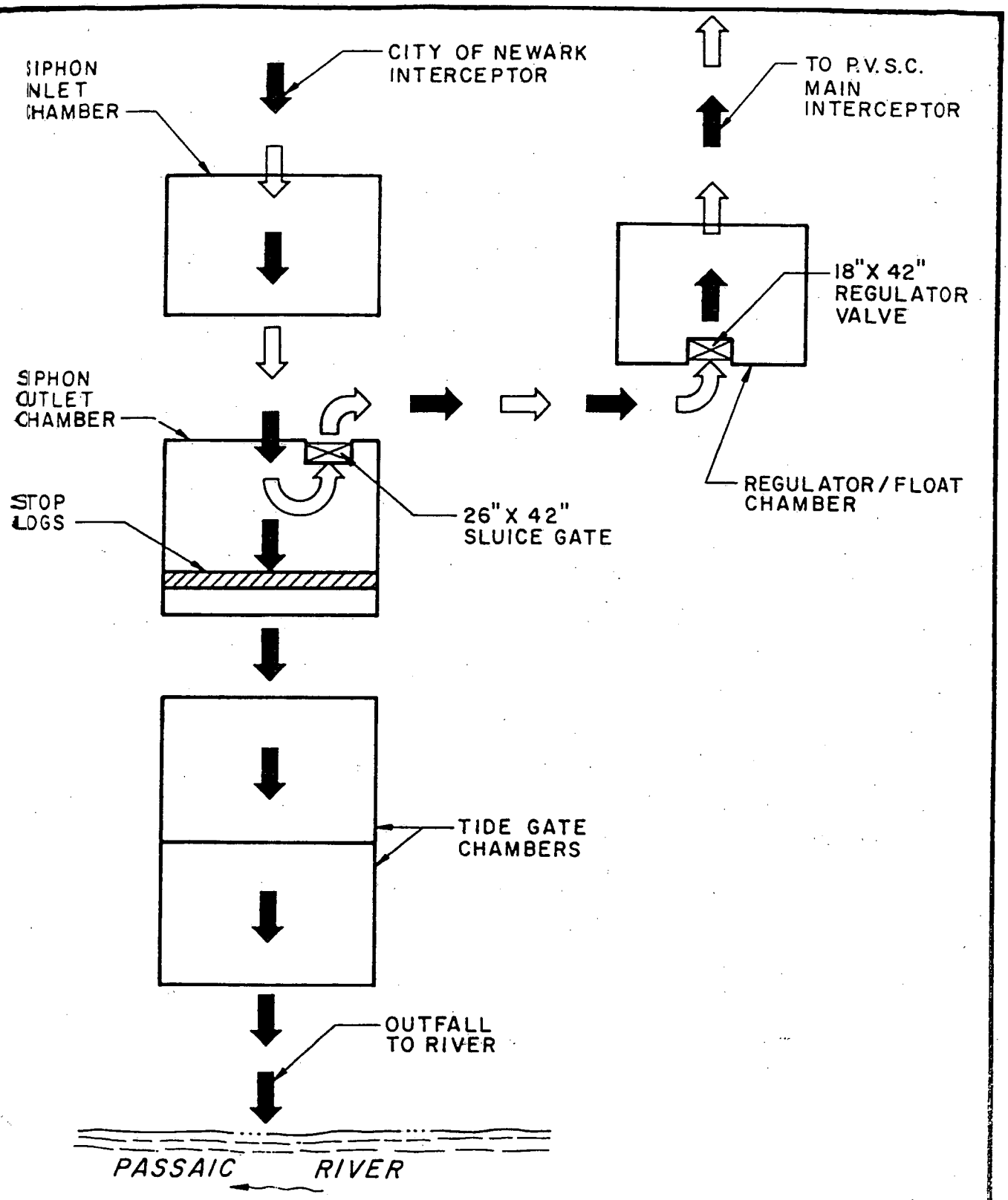
CITY DOCK, NEWARK

PLAN AND PROFILE

ELSON T. KILLAM ASSOCIATES, INC.
Consulting and Hydraulic Engineers

PLATE A

KLL001902



KLL001903

LEGEND

DRY WEATHER FLOW

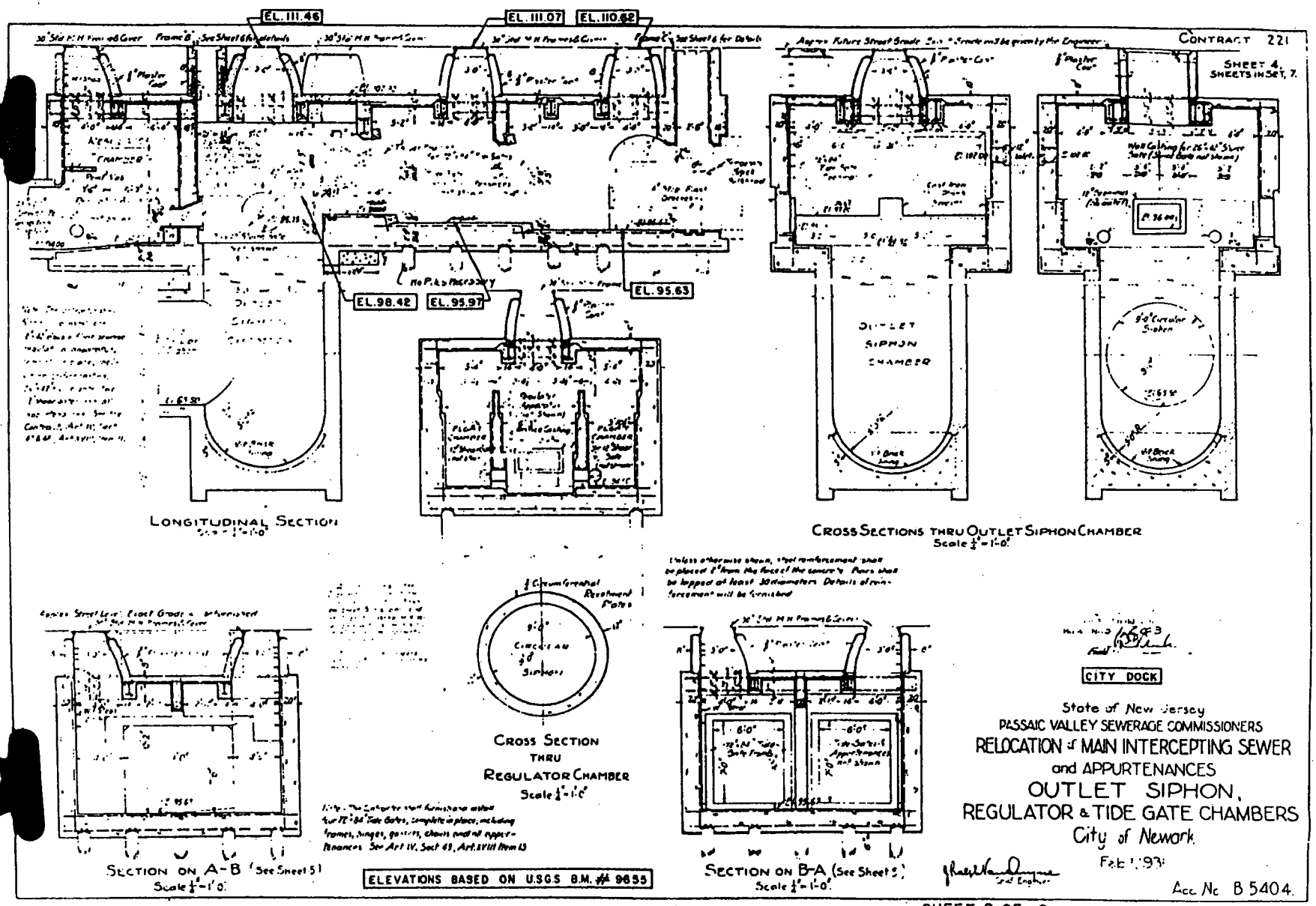
STORM FLOW/OVERFLOW

PASSAIC VALLEY SEWERAGE COMMISSIONERS

CITY DOCK, NEWARK

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC



SHEET 2 OF 2

PLATE R

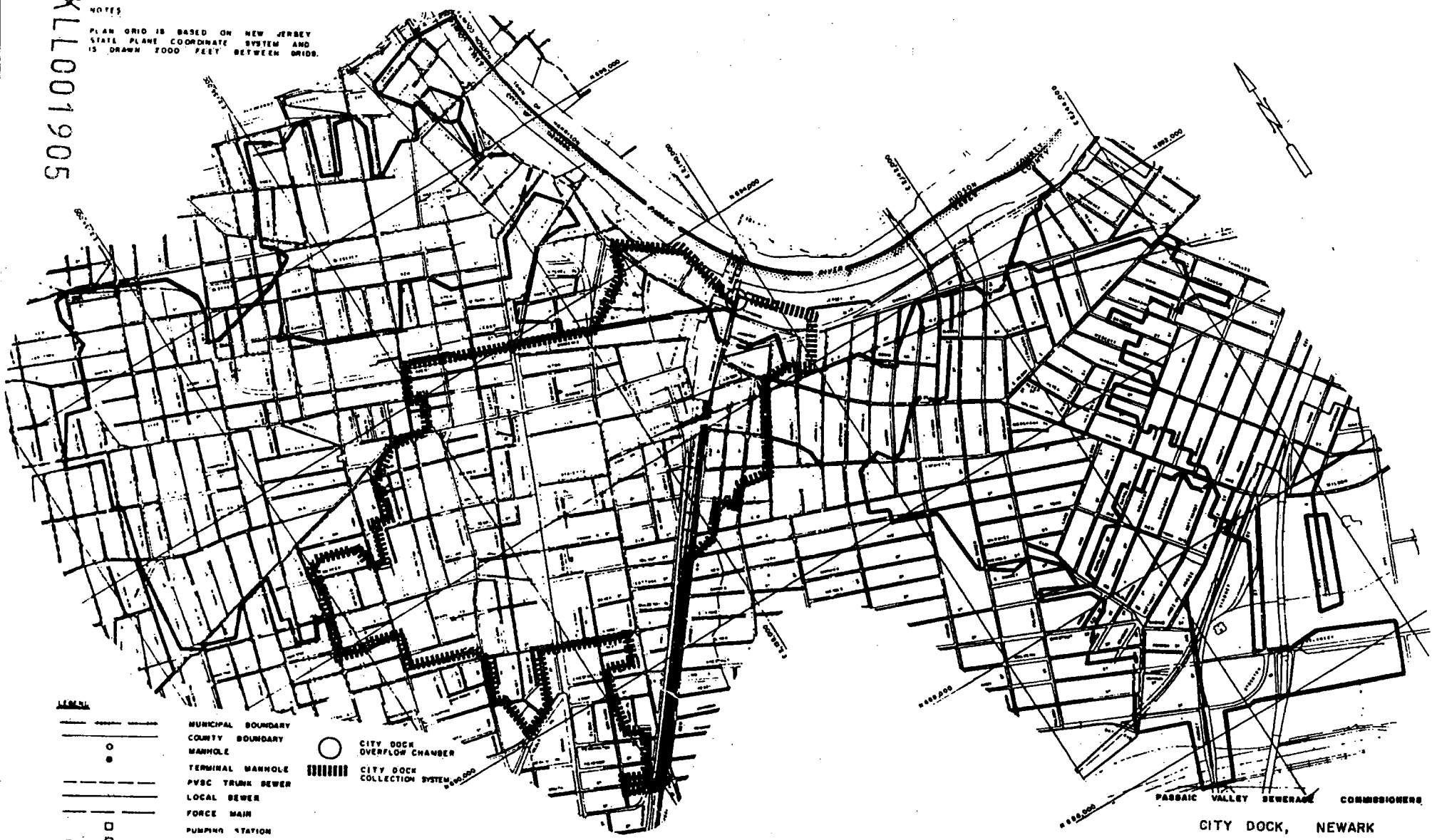
(3B)

KLL001904

KLL001905

NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.



PASSAIC VALLEY SEWERAGE COMMISSIONERS

CITY DOCK, NEWARK

PLAN OF COLLECTION SYSTEM

ELMON T. HILLIAN ASSOCIATES INC

PLATE D

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

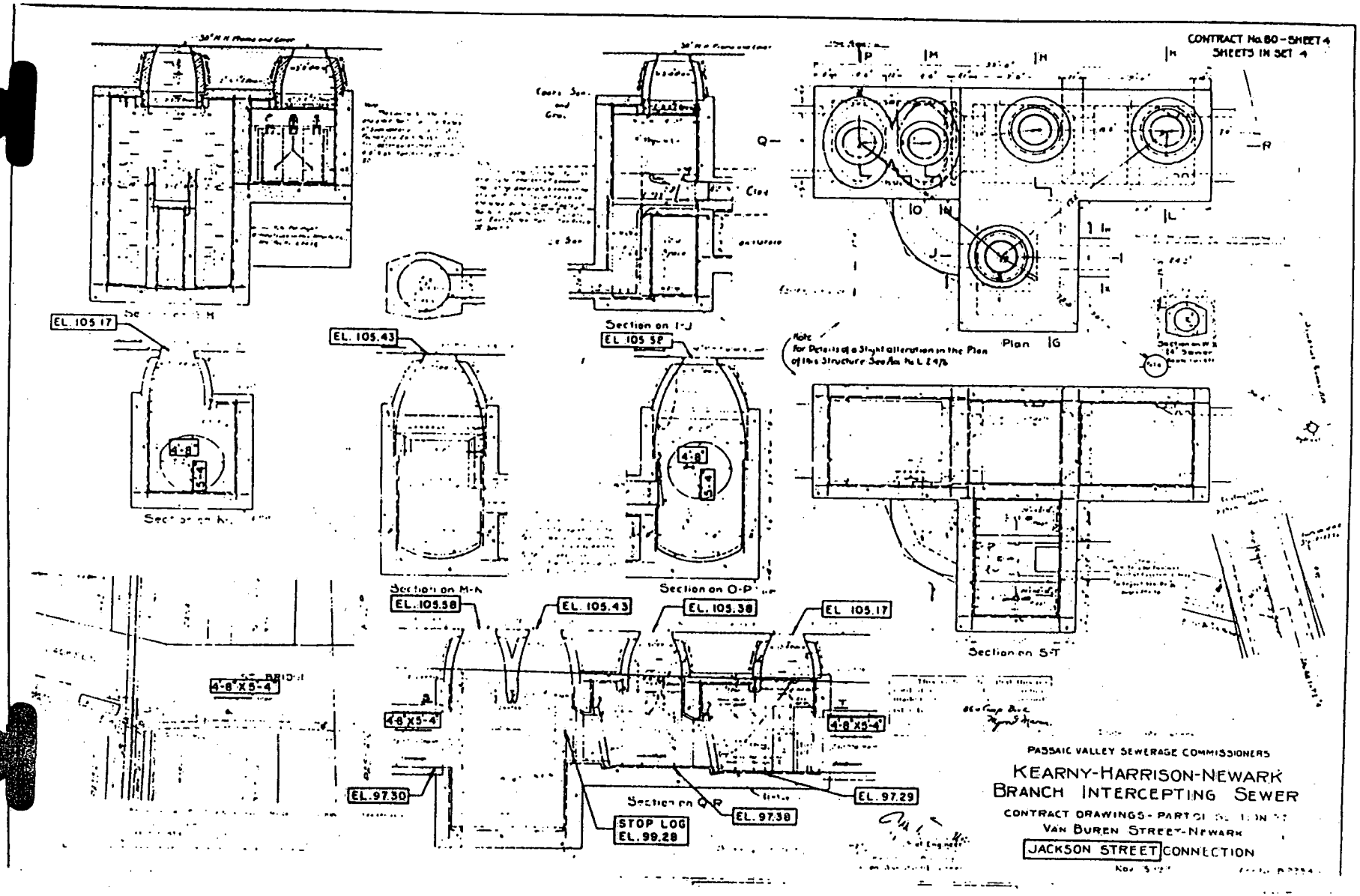
PASSAIC RIVER OVERFLOWS

JACKSON STREET, NEWARK
N-012

1976

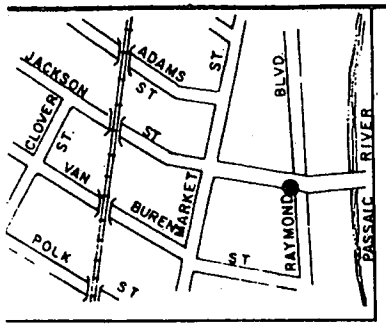
ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers [illegible]

KLL001906


CONTRACT No. 80 - SHEET 4
SHEETS IN SET 4
Section on I-J
Plan
Section on S-T
Section on M-N
Section on O-P
Section on Q-R
EL. 105.17
EL. 105.43
EL. 105.58
EL. 105.38
EL. 97.30
EL. 97.29
EL. 97.38
STOP LOG
EL. 99.28
4'-8" X 5'-4"
PASSAIC VALLEY SEWERAGE COMMISSIONERS
KEARNY-HARRISON-NEWARK
BRANCH INTERCEPTING SEWER
CONTRACT DRAWINGS - PART
VAN BUREN STREET-NEWARK
JACKSON STREET CONNECTION

(3)

KLL001907

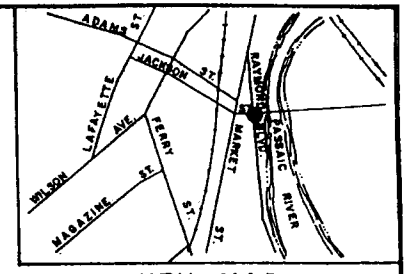


LOCATION PLAN

SCALE IN FEET

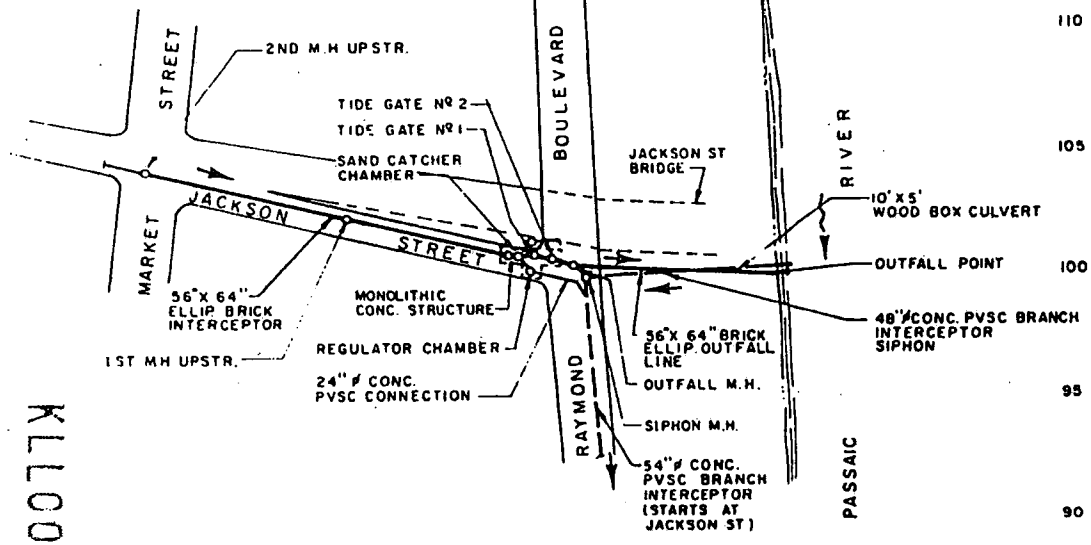
NOTE:
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY.

LEGEND:
DIRECTION OF FLOW
S.C. = SAND CATCHER
T.G. = TIDE GATE
UP STR. = UP STREAM
DN. STR. = DOWN STREAM
N.T.S. = NOT TO SCALE
● = OVERFLOW LOCATION



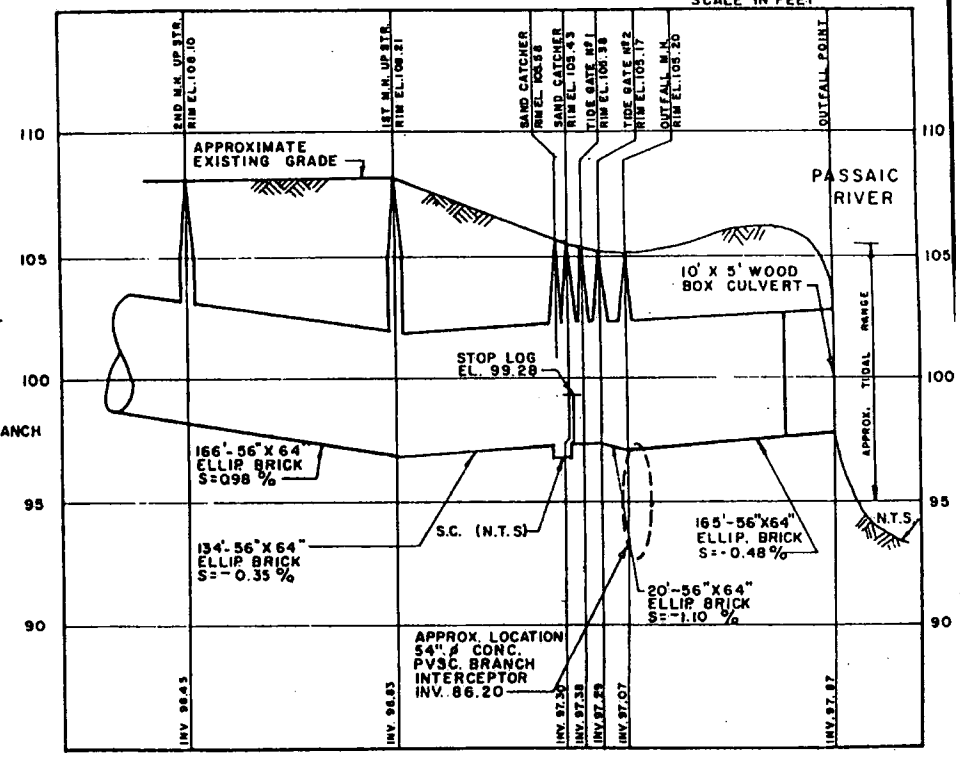
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER N-012

JACKSON STREET, NEWARK

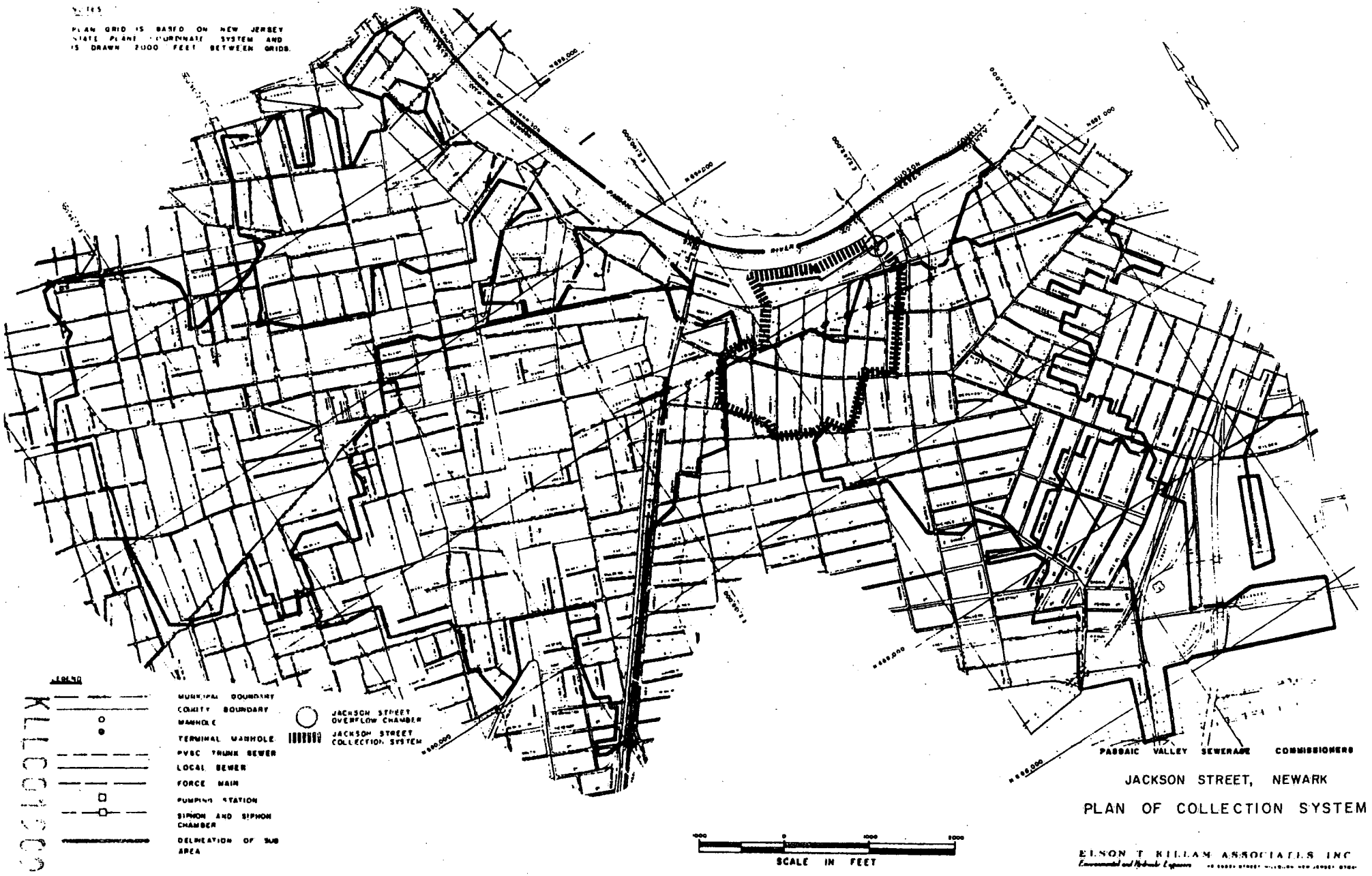
PLAN AND PROFILE

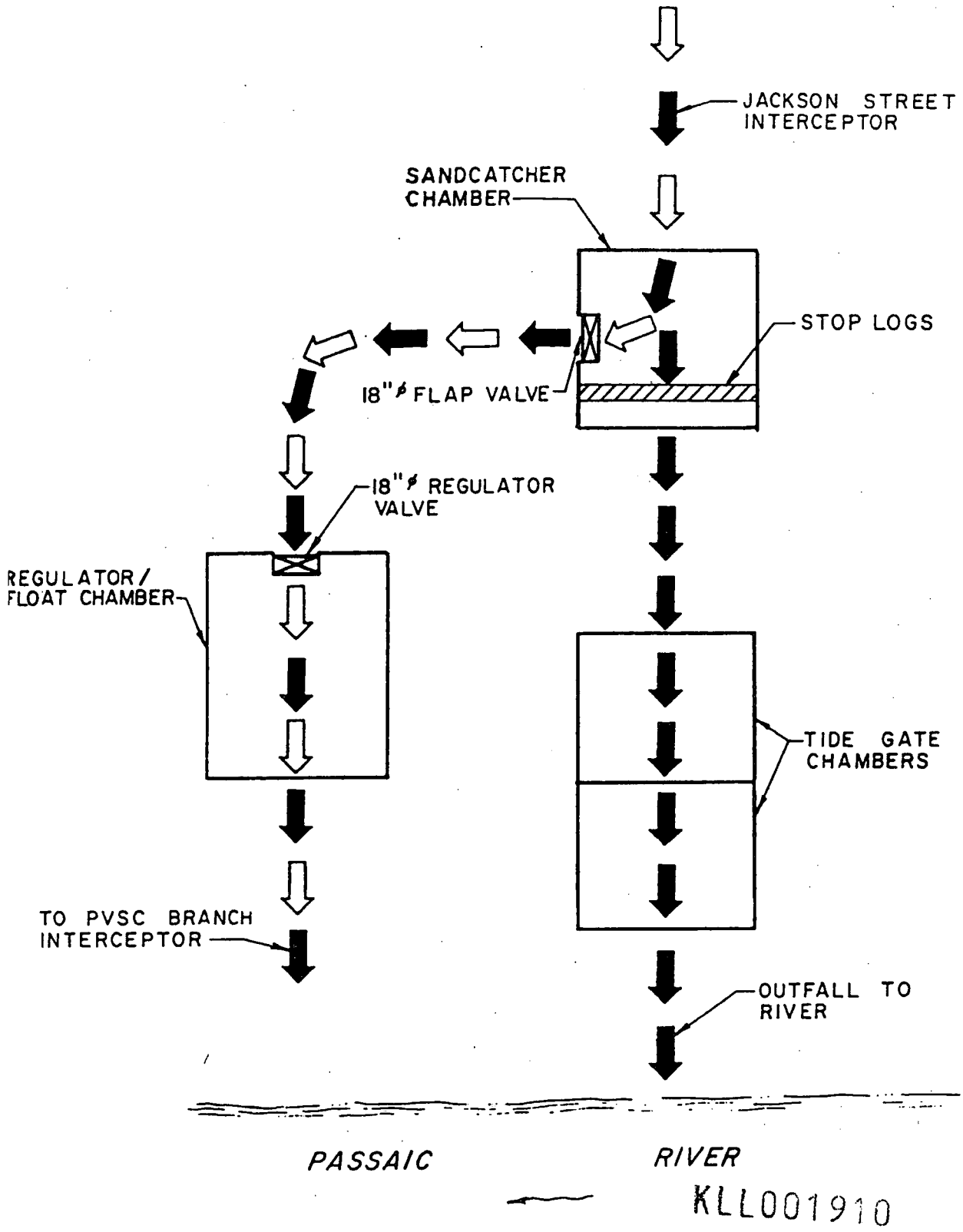
ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers 40 EXCHANGE STREET MILLBURN NEW JERSEY 07041

ALL ELEVATIONS BASED ON B.M. NF RV 1102 AS ESTABLISHED BY NEW JERSEY GEODETIC CONTROL SURVEY FOR LOCATION AND DESCRIPTION SEE APPENDIX.

KL00198

PLATE A


NOTES
PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.
LEGEND
MUNICIPAL BOUNDARY
COUNTY BOUNDARY
MANHOLE
TERMINAL MANHOLE
PVSC TRUNK SEWER
LOCAL SEWER
FORCE MAIN
PUMPING STATION
SIPHON AND SIPHON CHAMBER
DELINEATION OF SUB AREA
JACKSON STREET OVERFLOW CHAMBER
JACKSON STREET COLLECTION SYSTEM
SCALE IN FEET
PASSAIC VALLEY SEWERAGE COMMISSIONERS
JACKSON STREET, NEWARK
PLAN OF COLLECTION SYSTEM
ELSON T. KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers
PLATE D



KLL001910

LEGEND

DRY WEATHER FLOW

STORM FLOW/ OVERFLOW

PASSAIC VALLEY SEWERAGE COMMISSIONERS

JACKSON STREET, NEWARK

SCHEMATIC

ELSON T. KILLAM ASSOCIATES INC.
Environmental and Hydraulic Engineers

PLATE C

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

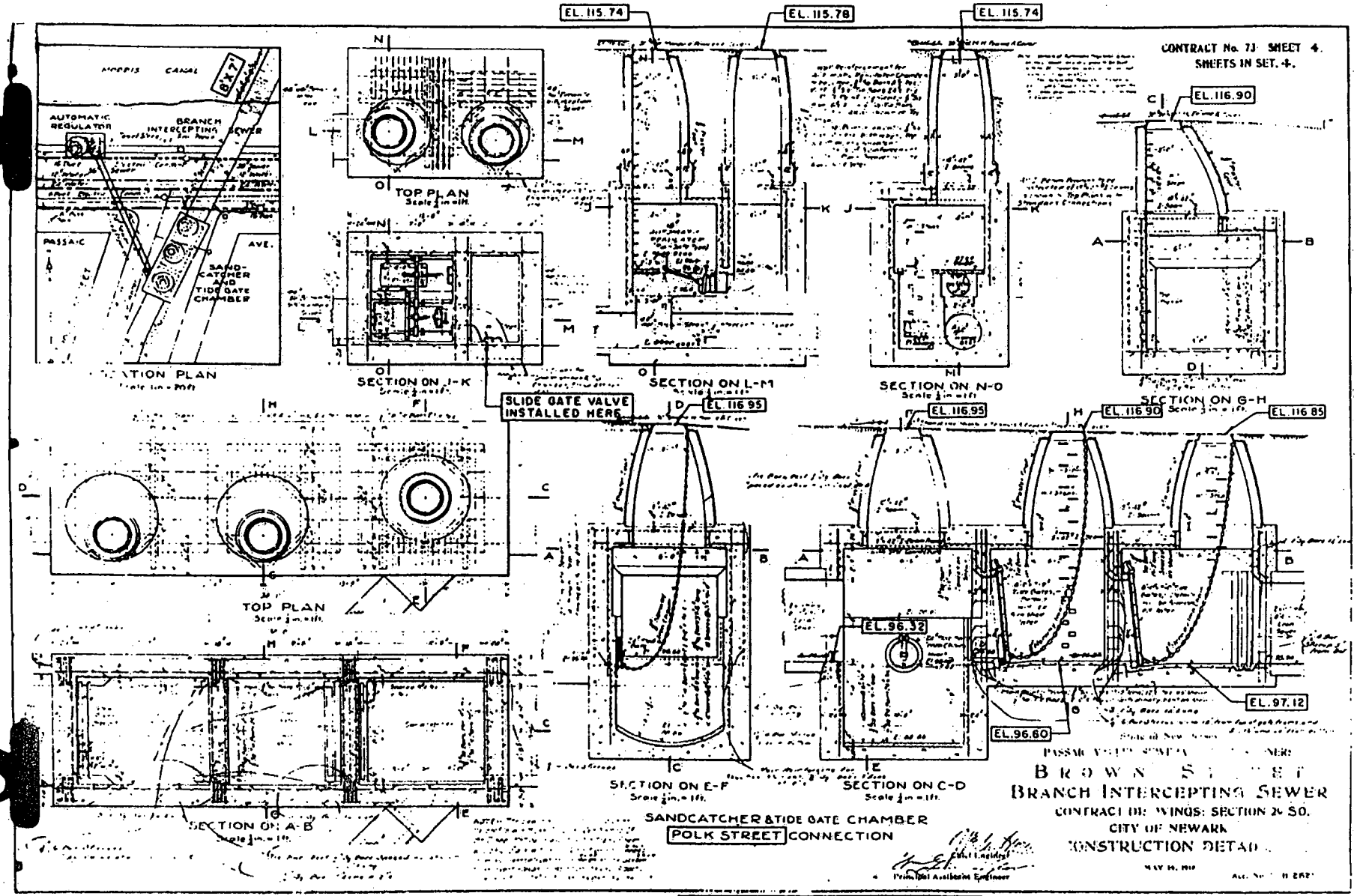
PASSAIC RIVER OVERFLOWS

POLK STREET, NEWARK
N-013

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers 40 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001911

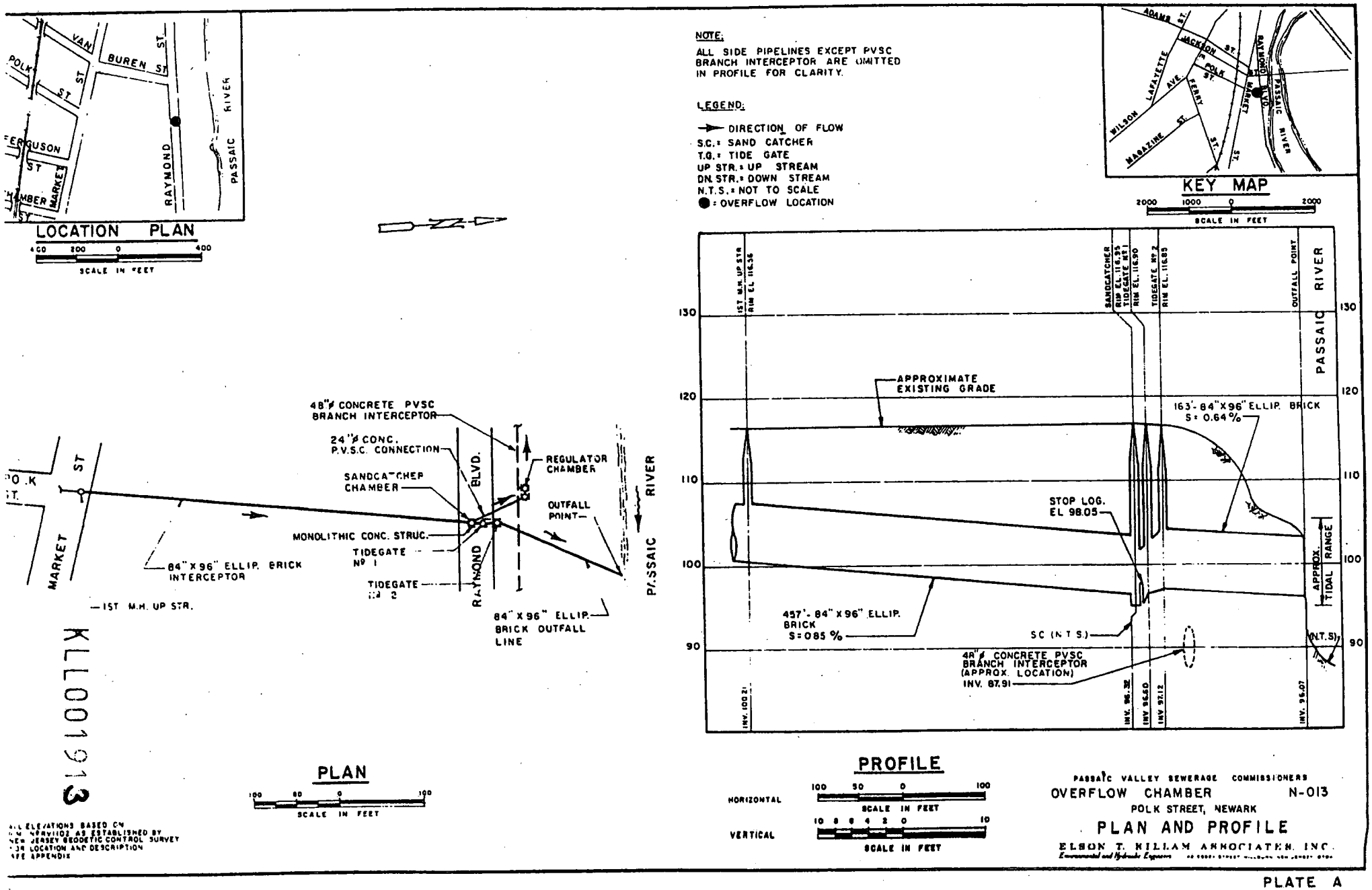


ELEVATIONS BASED ON USGS MON. RV#1102

PLATE B

KLL0[redacted]912

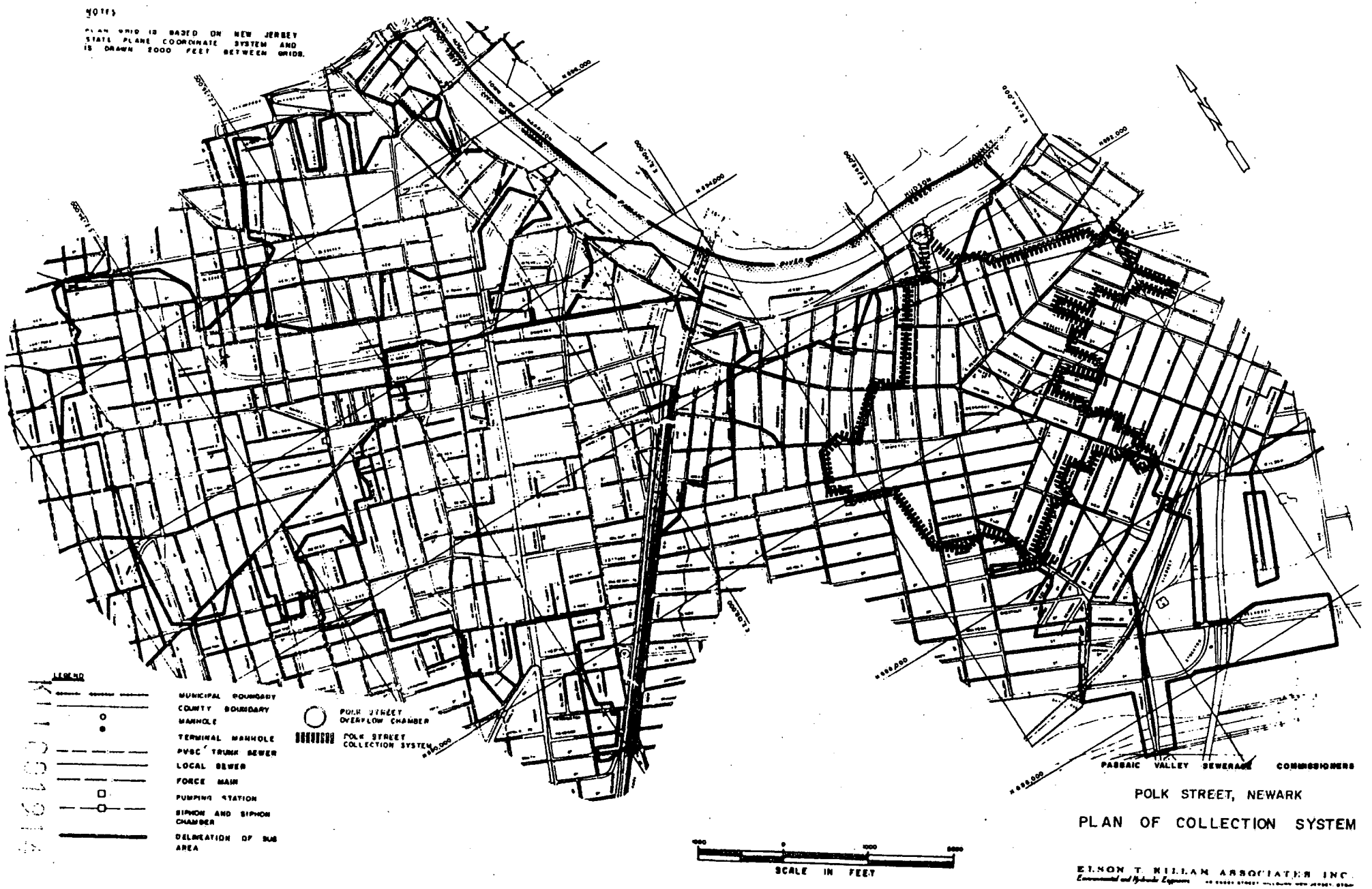
(3)



KLL001913

ALL ELEVATIONS BASED ON
NGVD 1902 AS ESTABLISHED BY
NEW JERSEY GEODETIC CONTROL SURVEY
FOR LOCATION AND DESCRIPTION
SEE APPENDIX

PLATE A



POLK STREET, NEWARK

PLAN OF COLLECTION SYSTEM

ELMON T. HILLAN ASSOCIATES INC.
Environmental and Hydraulic Engineers

PLATE D

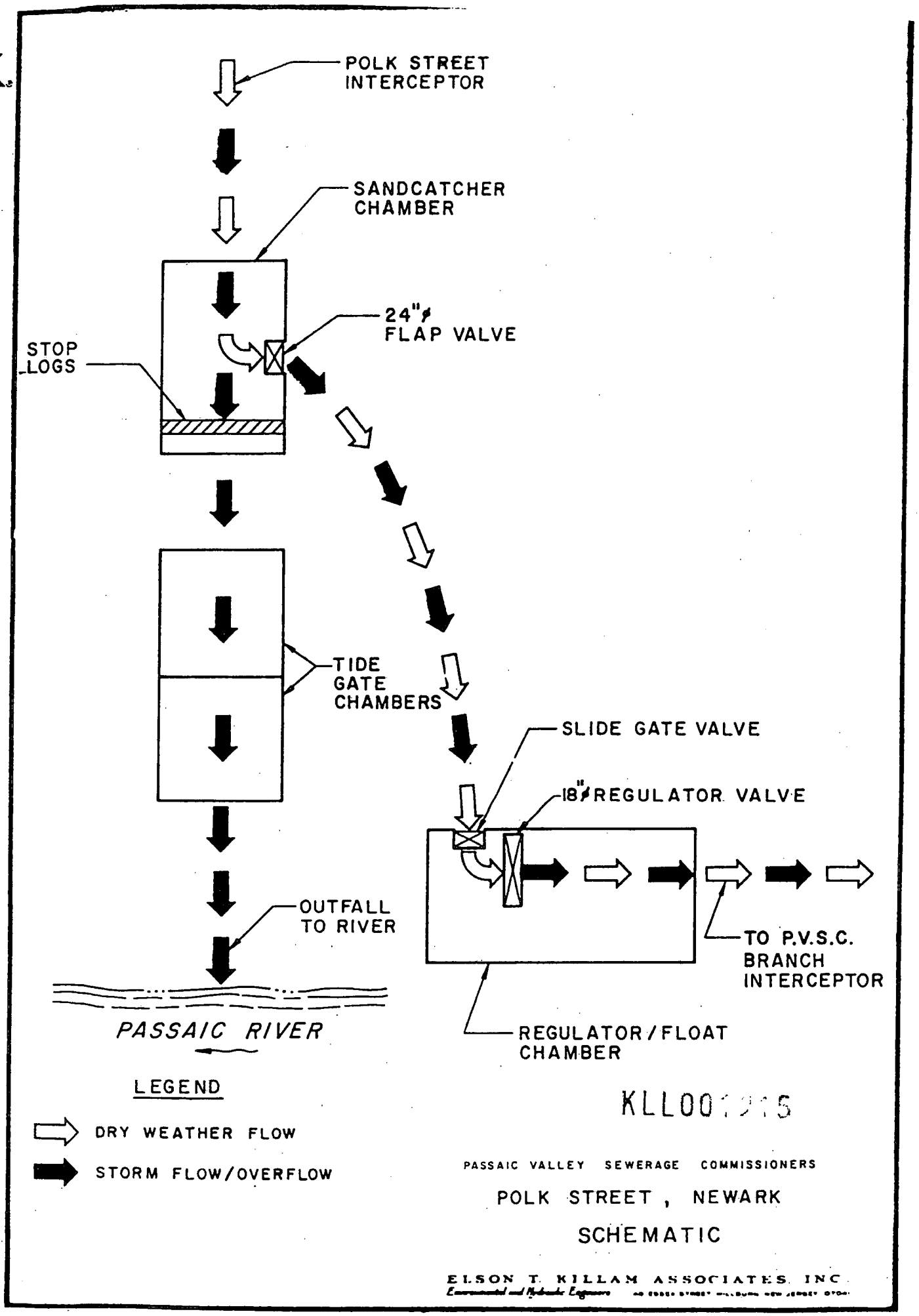

POLK STREET INTERCEPTOR
SANDCATCHER CHAMBER
24"ø FLAP VALVE
STOP LOGS
TIDE GATE CHAMBERS
SLIDE GATE VALVE
18"ø REGULATOR VALVE
OUTFALL TO RIVER
TO P.V.S.C. BRANCH INTERCEPTOR
PASSAIC RIVER
REGULATOR/FLOAT CHAMBER
LEGEND
DRY WEATHER FLOW
STORM FLOW/OVERFLOW
KLL001015
PASSAIC VALLEY SEWERAGE COMMISSIONERS
POLK STREET, NEWARK
SCHEMATIC
ELSON T. KILLAM ASSOCIATES, INC.

PLATE C

REPORT UPON

OVERFLOW ANALYSIS

TO

PASSAIC VALLEY SEWERAGE COMMISSIONERS

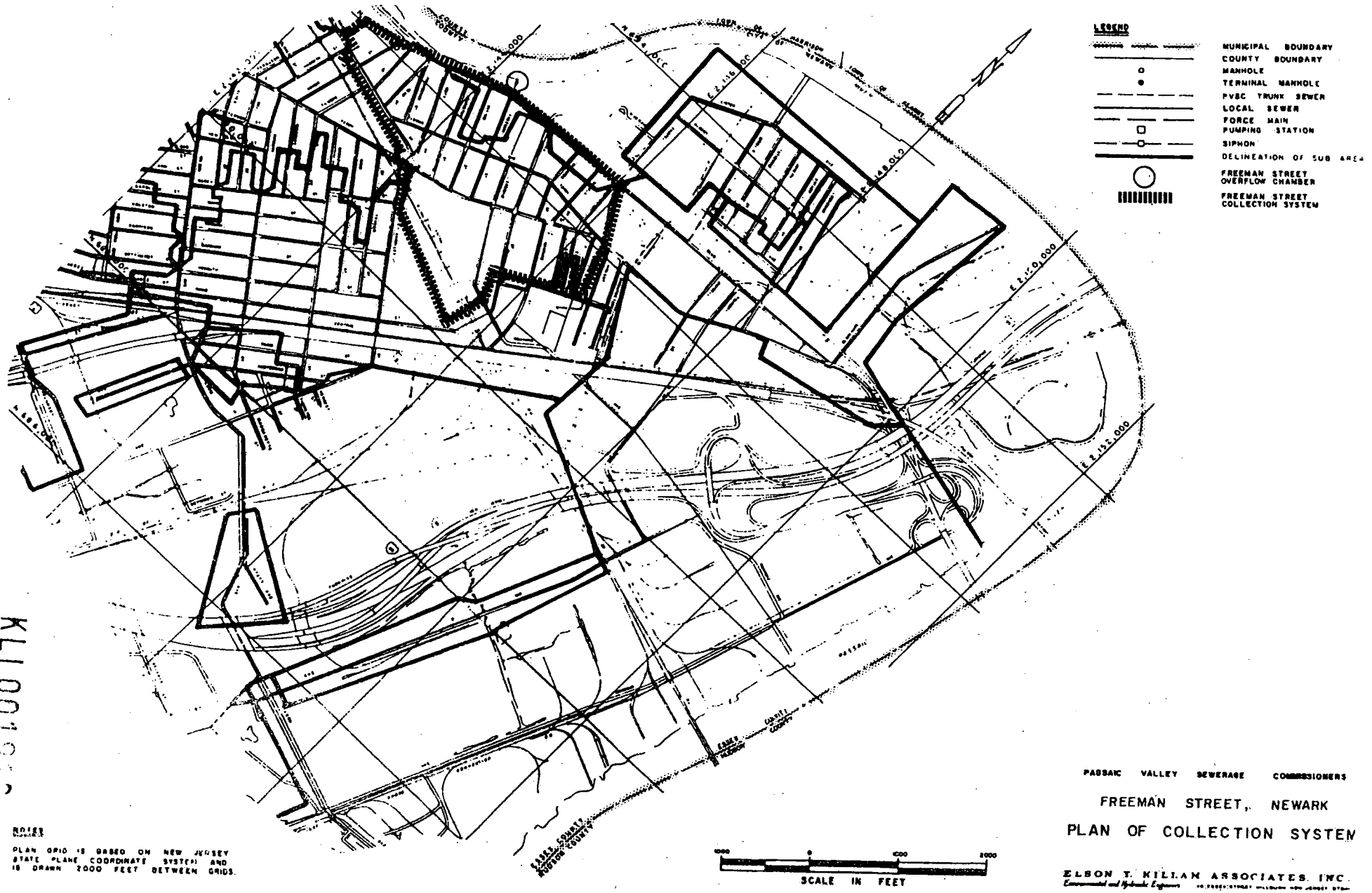
PASSAIC RIVER OVERFLOWS

FREEMAN STREET, NEWARK
N-014

1976

ELSON T KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers
48 ESSEX STREET MILLBURN NEW JERSEY 07041

KLL001916



NOTES

PLAN GRID IS BASED ON NEW JERSEY STATE PLANE COORDINATE SYSTEM AND IS DRAWN 2000 FEET BETWEEN GRIDS.

PASSAIC VALLEY SEWERAGE COMMISSIONERS

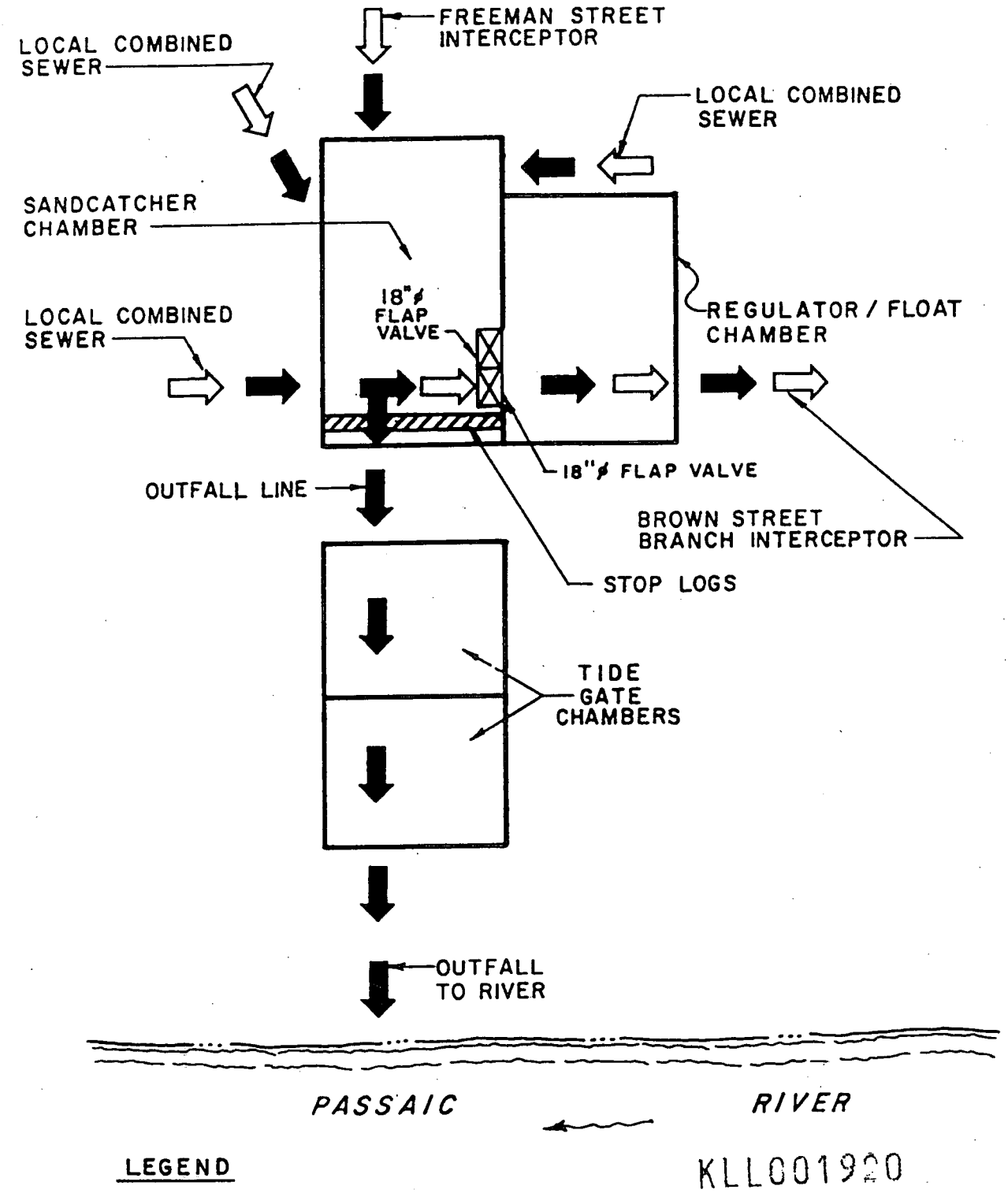
FREEMAN STREET, NEWARK

PLAN OF COLLECTION SYSTEM

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE D

KLL001910



LEGEND

DRY WEATHER FLOW

STORM FLOW/OVERFLOW

KLL001920

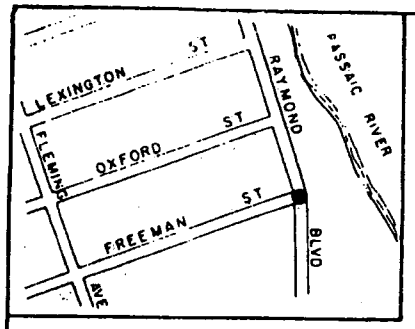
PASSAIC VALLEY SEWERAGE COMMISSIONERS

FREEMAN STREET, NEWARK

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers

PLATE C



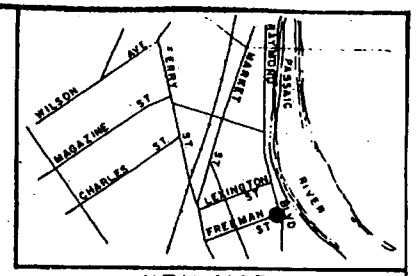
LOCATION PLAN

SCALE IN FEET

NOTE:
ALL SIDE PIPELINES EXCEPT PVSC BRANCH INTERCEPTOR ARE OMITTED IN PROFILE FOR CLARITY

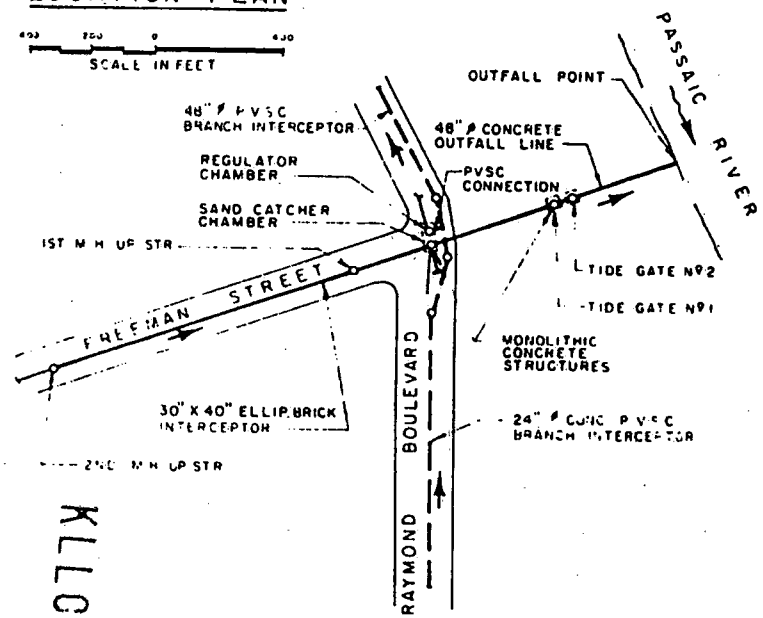
LEGEND:

- DIRECTION OF FLOW
- SC : SAND CATCHER
- TG : TIDE GATE
- UP STR : UP STREAM
- DN STR : DOWN STREAM
- N.T.S. : NOT TO SCALE
- ● : OVERFLOW LOCATION



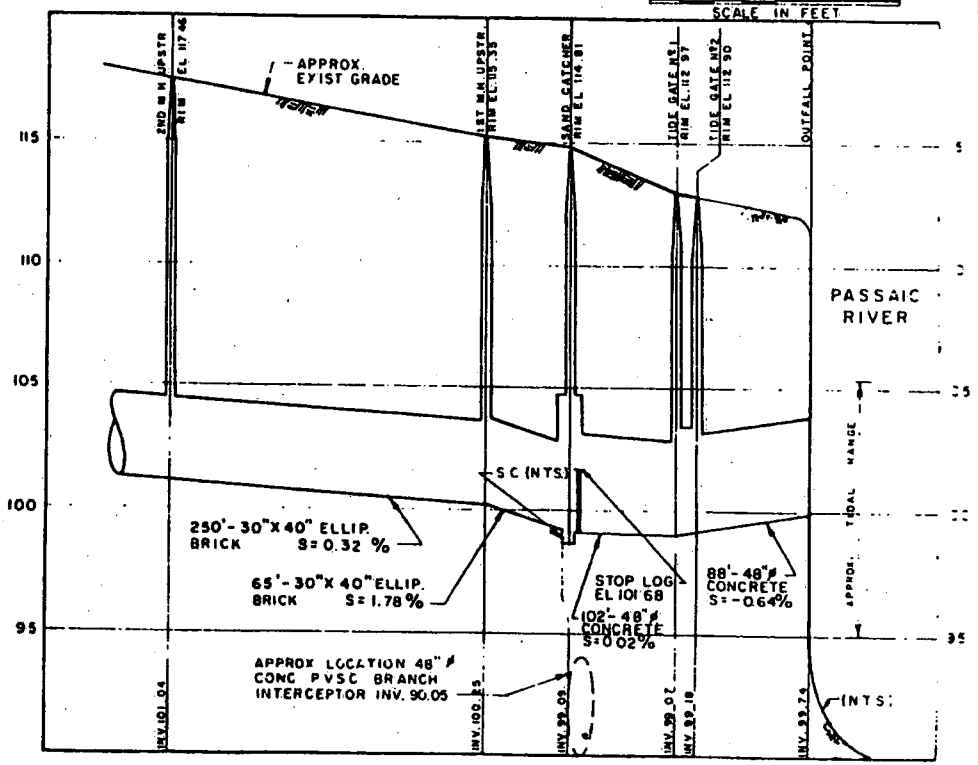
KEY MAP

SCALE IN FEET



PLAN

SCALE IN FEET



PROFILE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

PASSAIC VALLEY SEWERAGE COMMISSIONERS

OVERFLOW CHAMBER N-014

FREEMAN STREET, NEWARK

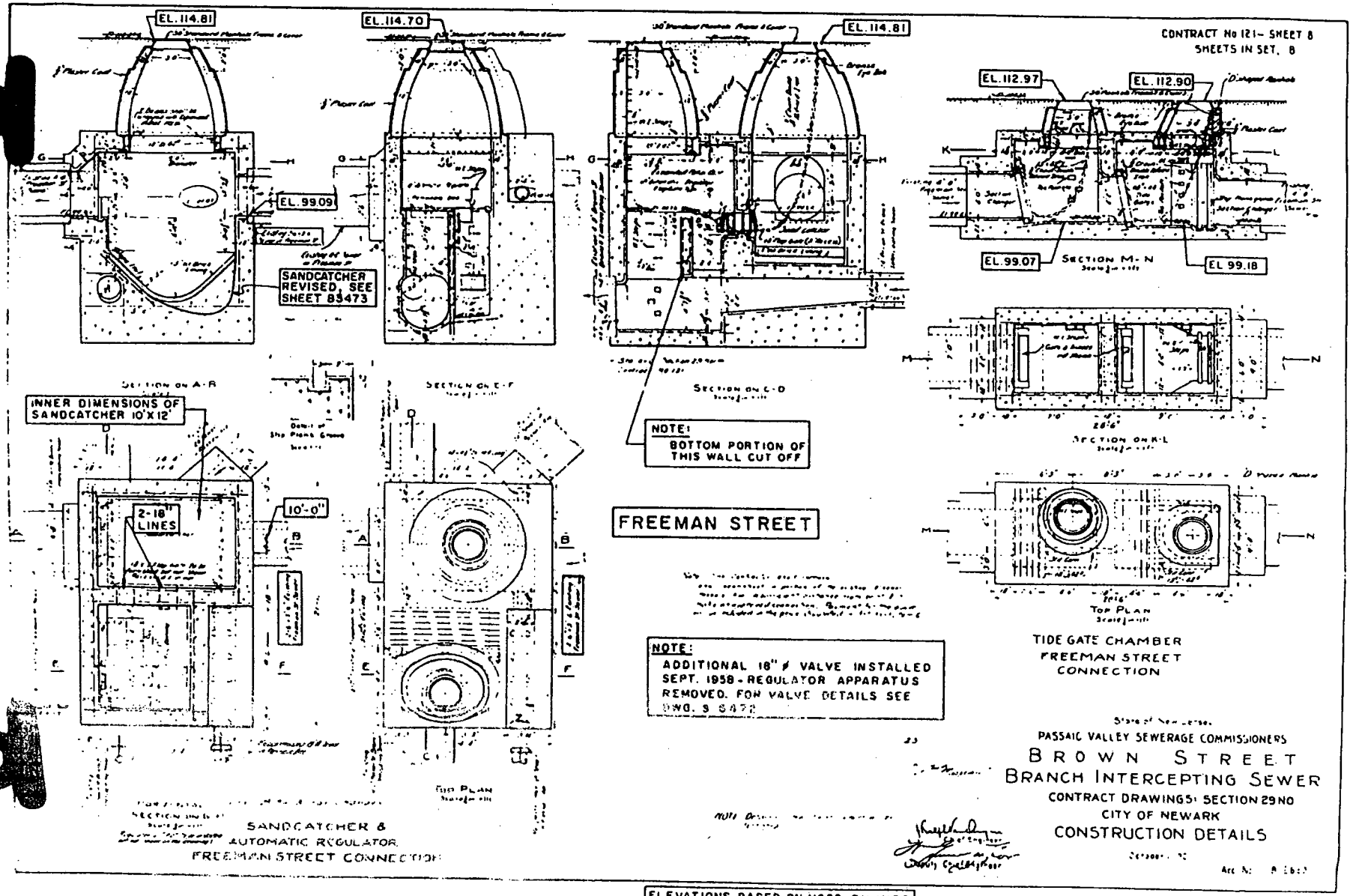
PLAN AND PROFILE

ELRON T. KILLAM ASSOCIATES INC
Environmental and Hydraulic Engineers

ALL ELEVATIONS BASED ON
B.M. NEWARK AS ESTABLISHED BY
NEW JERSEY GEODETIC CONTROL SURVEY
FOR LOCATION AND DESCRIPTION
SEE APPENDIX.

KLL001918

PLATE A



ELEVATIONS BASED ON USGS RV#1102

PLATE 8

(3)

KL100917

Passaic Valley Sewerage Commissioners

Sewer System Inventory and Assessment Report

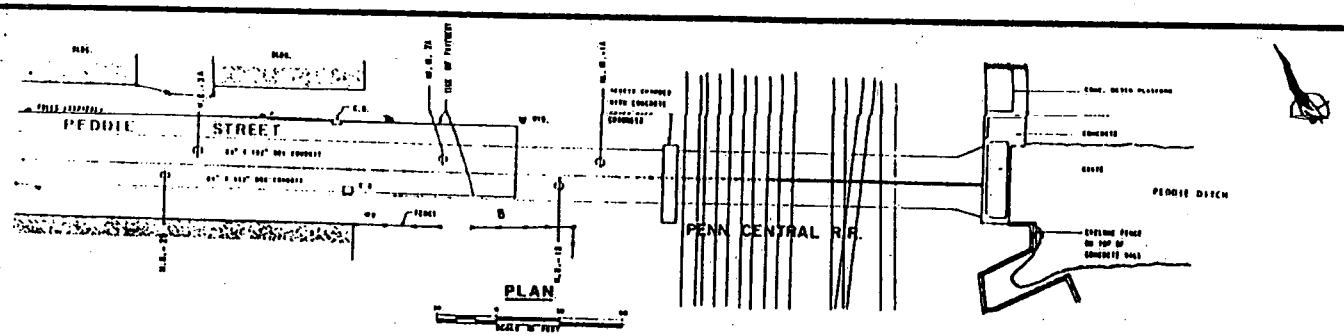
CSO Control Facility Information

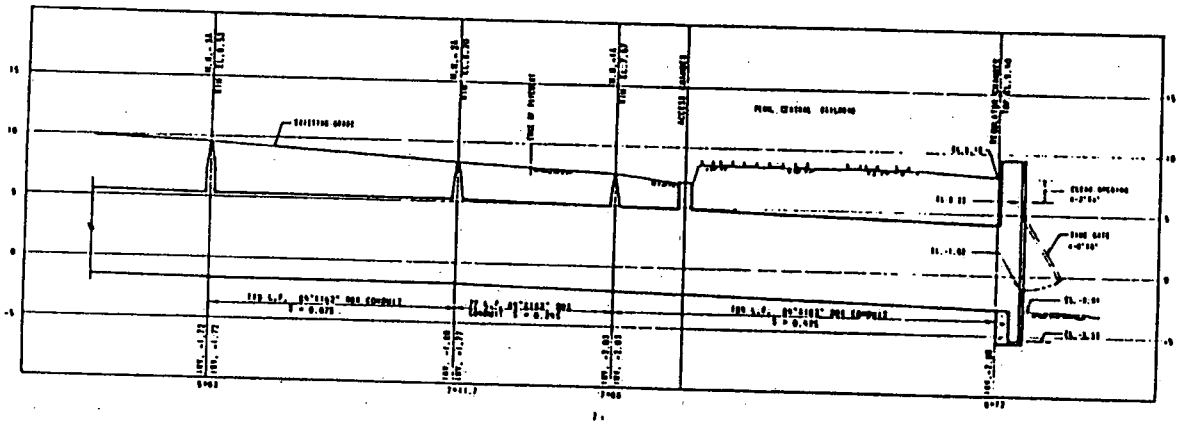
on

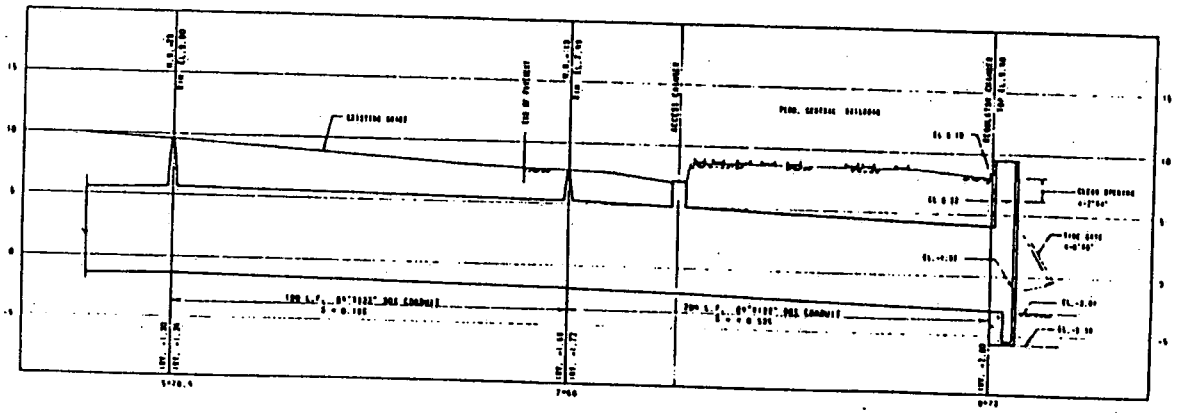
Peddie District, Newark
PVSC NJPDES No. 60

1996

KLL001921







PROFILE

PASSAIC VALLEY SEWERAGE COMMISSIONERS

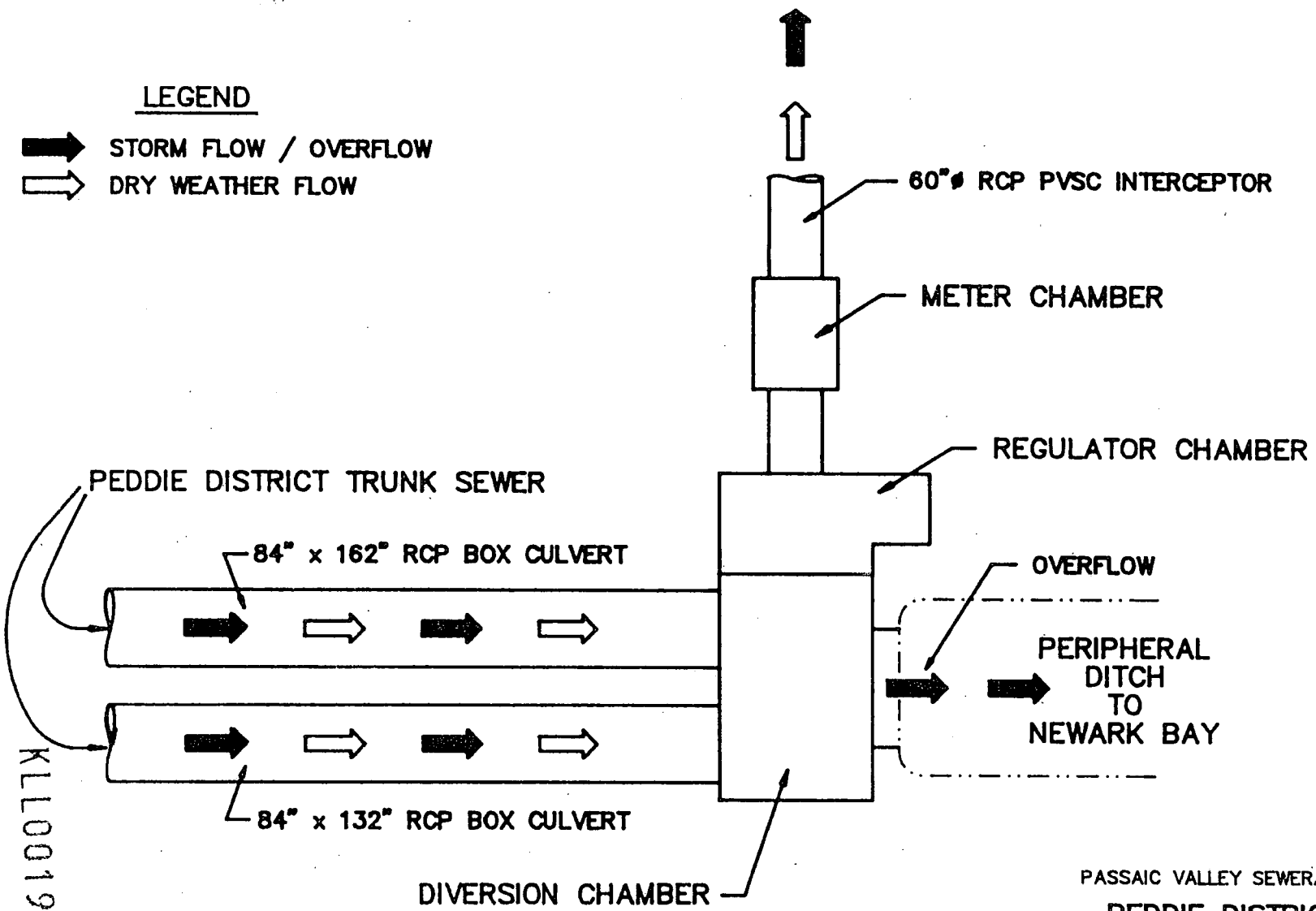
PEDDIE DISTRICT, NEWARK

PLAN AND PROFILE

Killam
Associates • Consulting Engineers

PLATE A

KLL001922



PASSAIC VALLEY SEWERAGE COMMISSIONERS

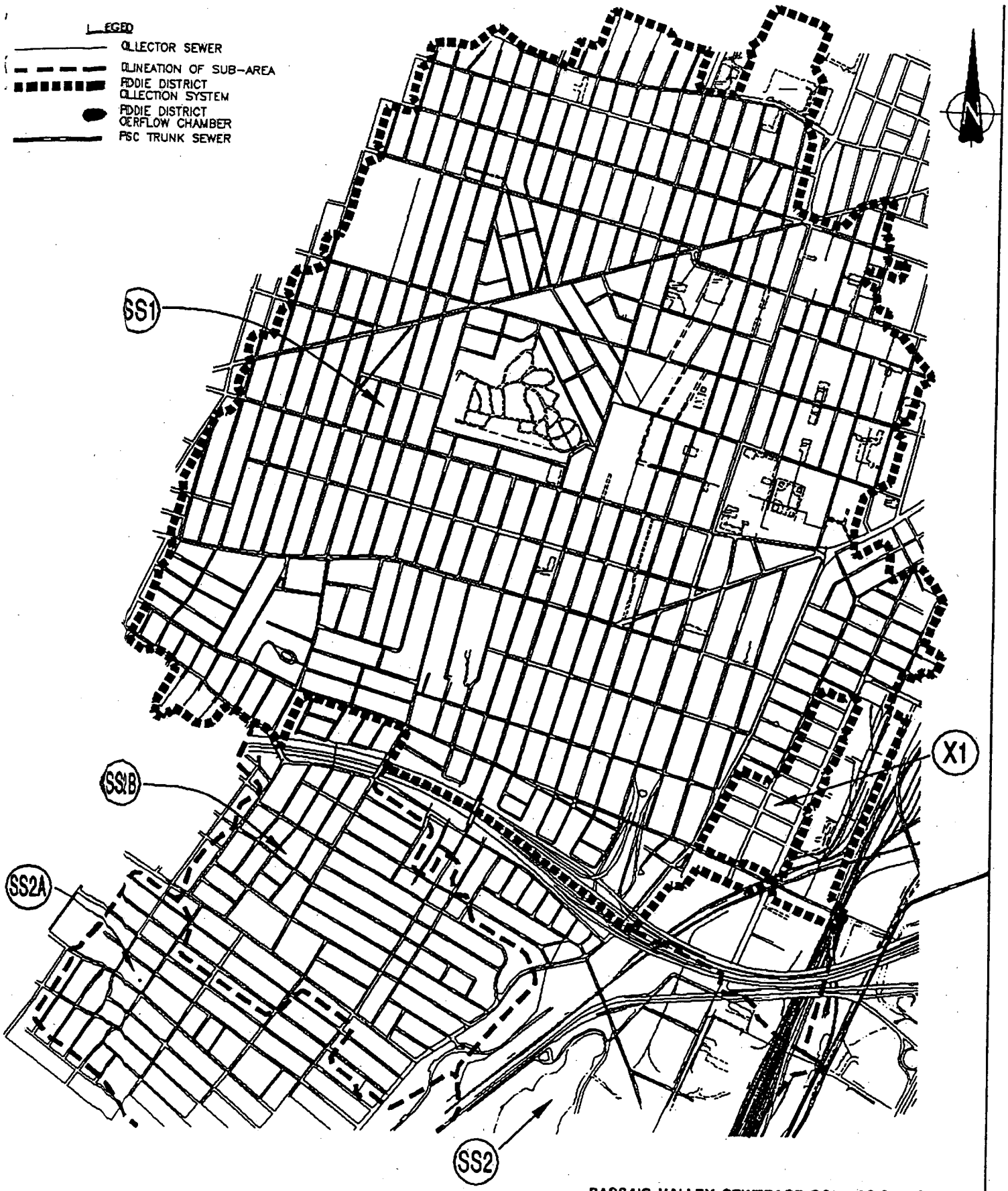
PEDDIE DISTRICT, NEWARK

SCHEMATIC

Killam Associates Consulting Engineers

PLATE B

KLL001923



PASSAIC VALLEY SEWERAGE COMMISSIONERS
PEDDIE DISTRICT, NEWARK
PLAN OF COLLECTION SYSTEM

1500 0 1500 3000
SCALE IN FEET

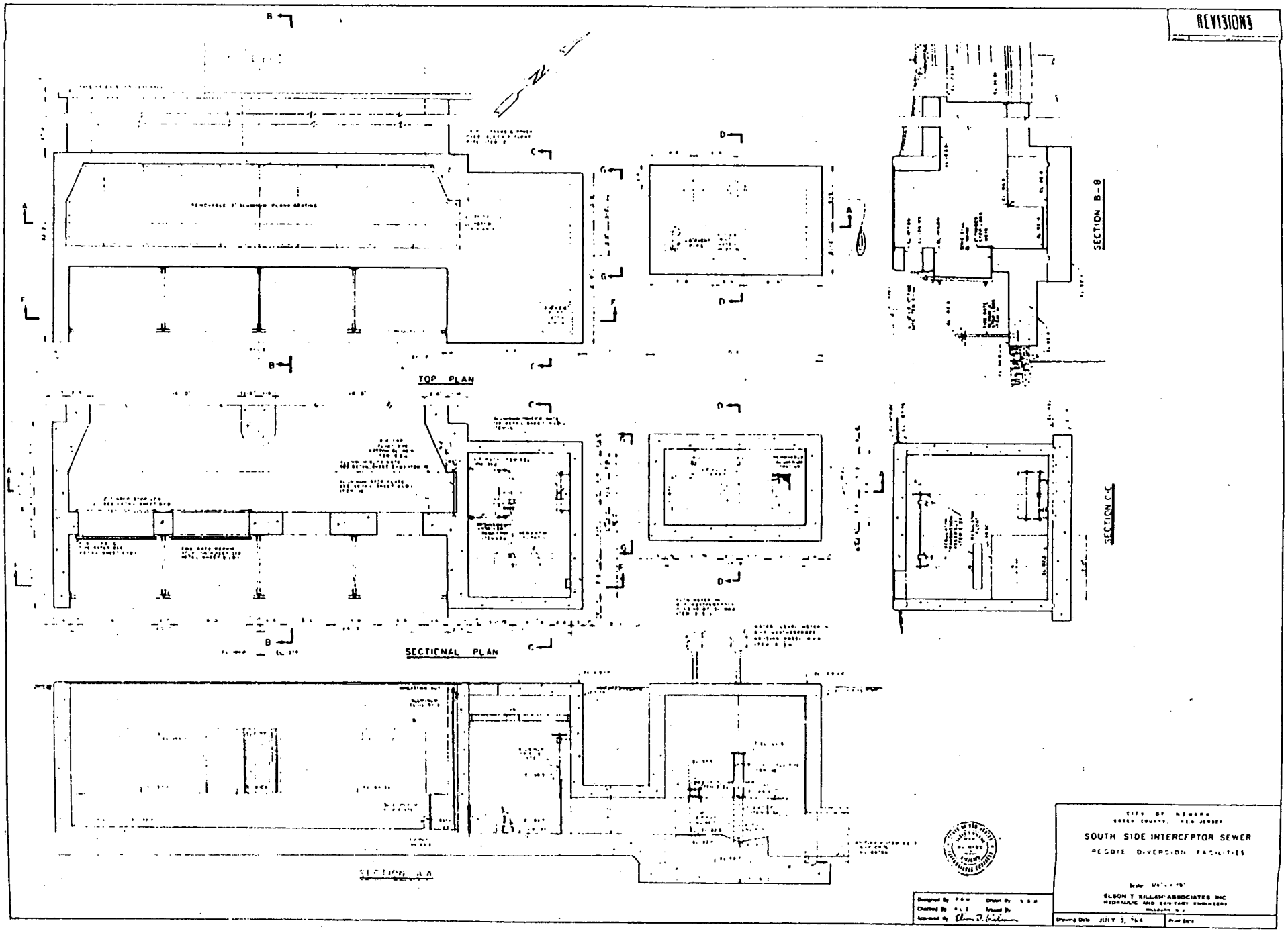
KLL001924

Killam Associates Consulting Engineers

PLATE C

2/23/96

REVISIONS



KLLC01925 PLATED

Passaic Valley Sewerage Commissioners

Sewer System Inventory and Assessment Report

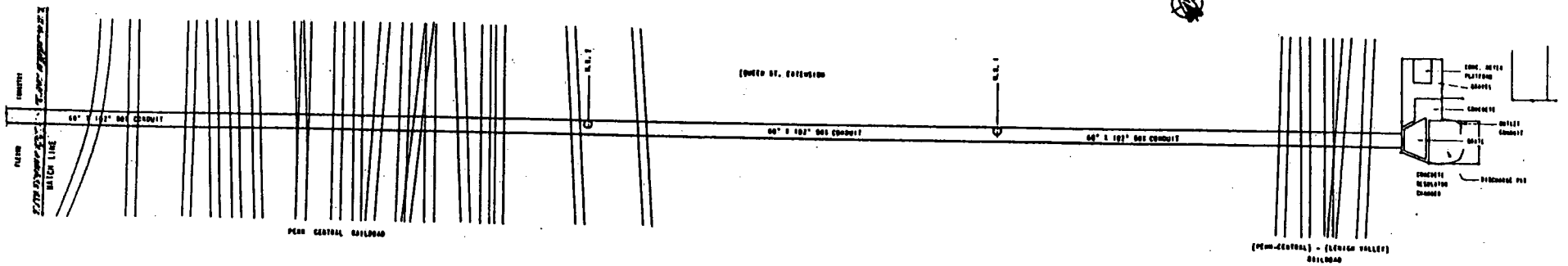
CSO Control Facility Information

on

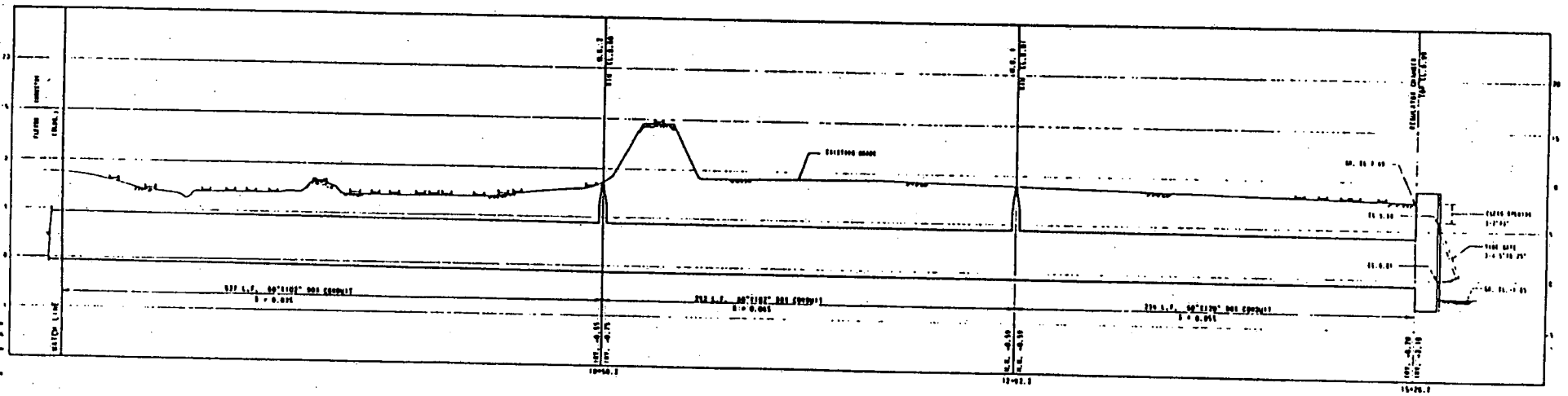
Queen Street, Newark
PVSC NJPDES No. 61

1996

KLL001926



PLAN



PROFILE

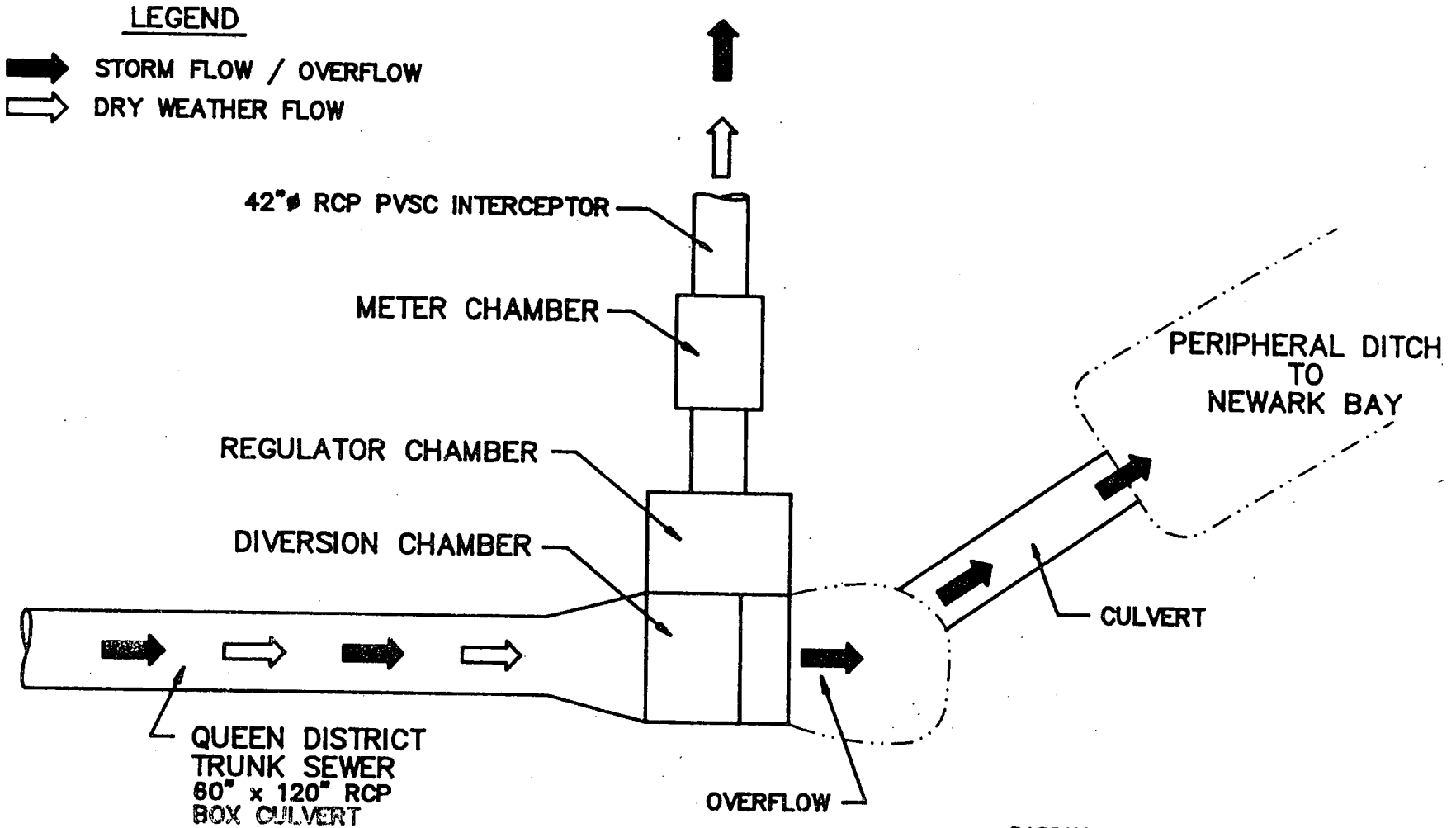
PASSAIC VALLEY SEWERAGE COMMISSIONERS

QUEEN DISTRICT, NEWARK

PLAN AND PROFILE

Killam Associates Consulting Engineers

PLATE 1



PASSAIC VALLEY SEWERAGE COMMISSIONERS

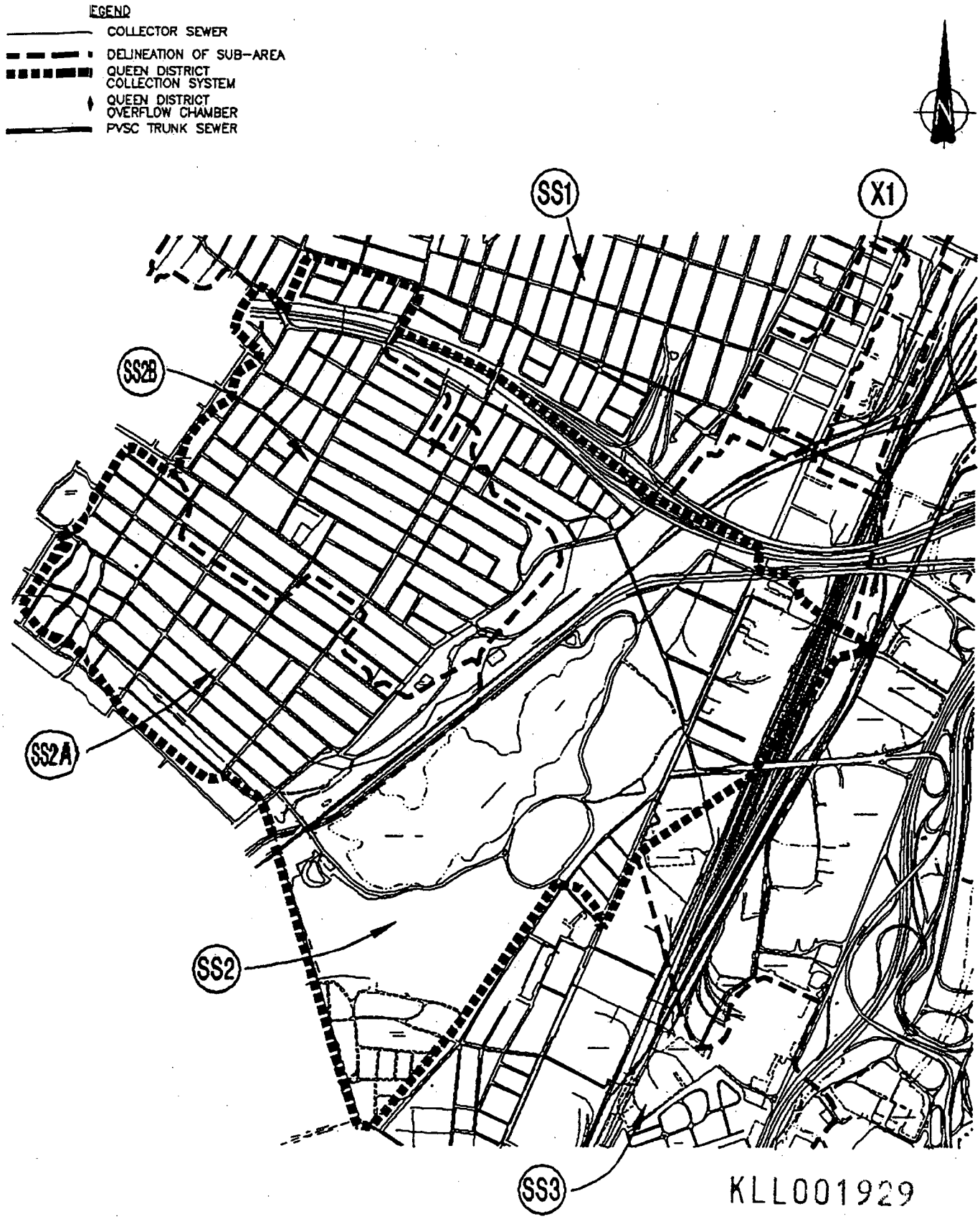
QUEEN DISTRICT, NEWARK

SCHEMATIC

Killam

PLATE B

KLLC01928



KLL001929

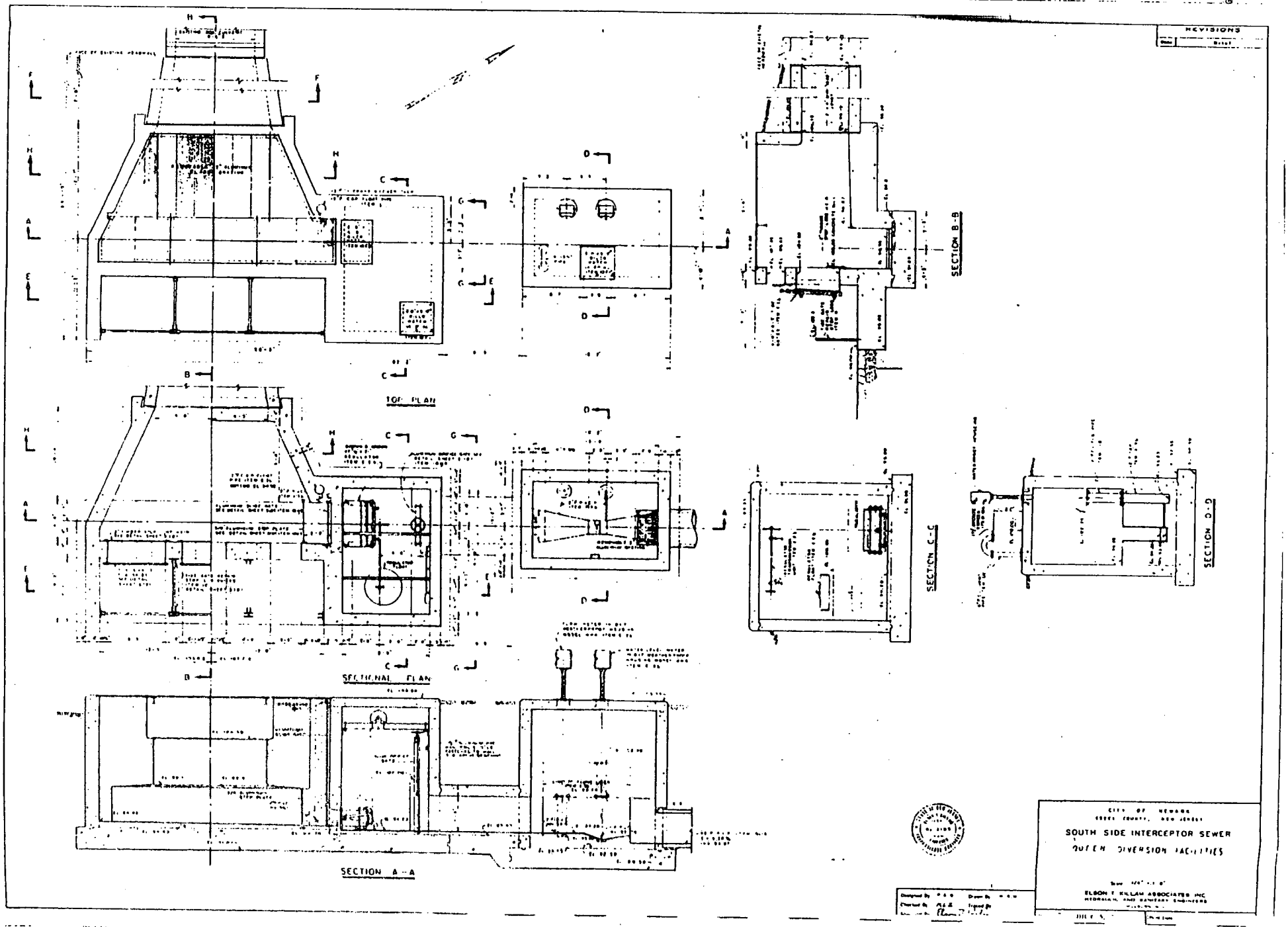
PASSAIC VALLEY SEWERAGE COMMISSIONERS
QUEEN DISTRICT, NEWARK
PLAN OF COLLECTION SYSTEM

1500 0 1500 3000
SCALE IN FEET

Killam
Associates Consulting Engineers

PLATE C

2/23/96



KLL001930

PLATED

Passaic Valley Sewerage Commissioners

Sewer System Inventory and Assessment Report

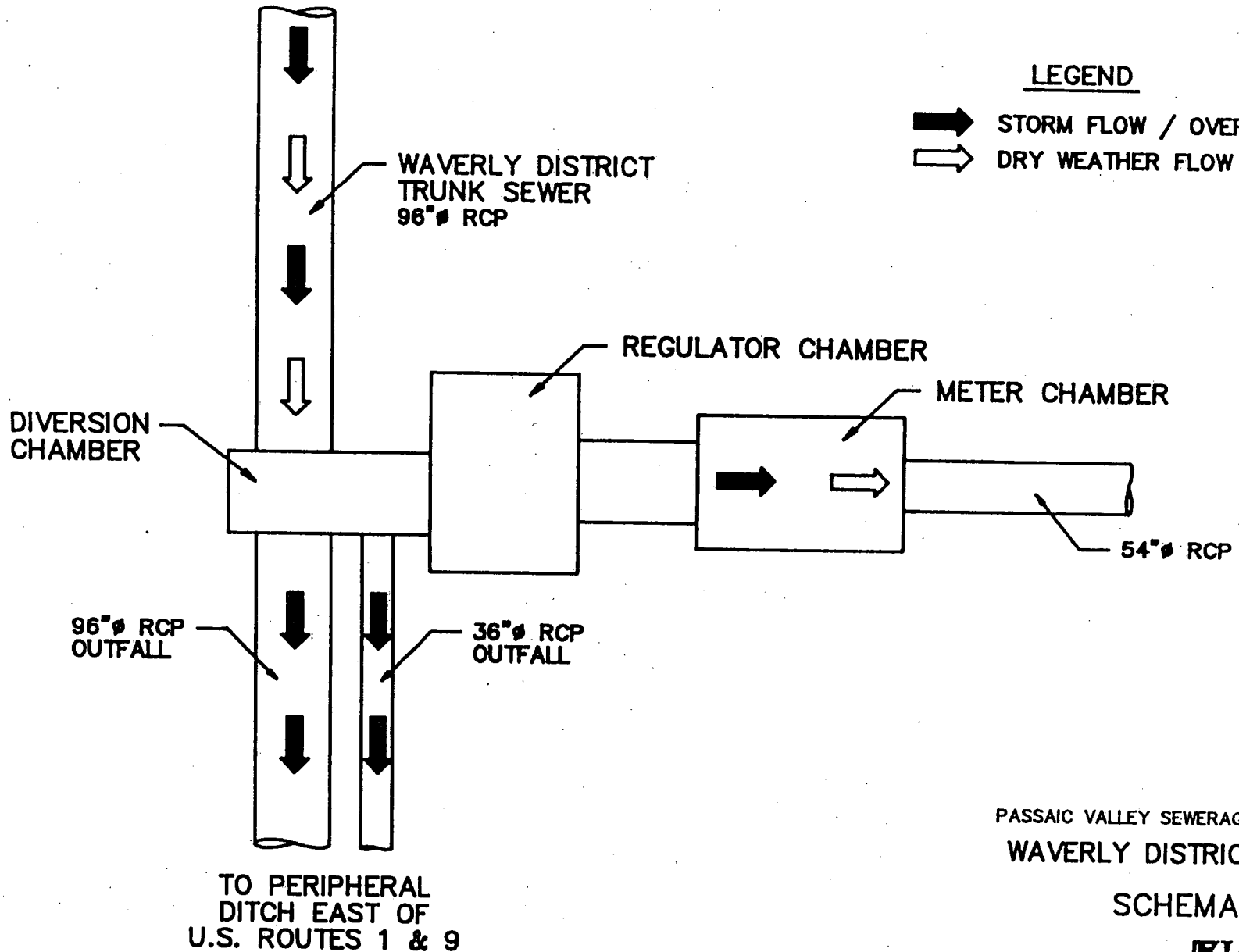
CSO Control Facility Information

on

Waverly District, Newark
PVSC NJPDES No. 6

1996

KLL001931



PASSAIC VALLEY SEWERAGE COMMISSIONERS

WAVERLY DISTRICT, NEWARK

SCHEMATIC

Killam

PLATE B

KLL001932

LEGEND

- COLLECTOR SEWER
- DELINEATION OF SUB-AREA
- WAVERLY DISTRICT COLLECTION SYSTEM
- WAVERLY DISTRICT OVERFLOW CHAMBER
- PVSC TRUNK SEWER

KLLC01933

PASSAIC VALLEY SEWERAGE COMMISSIONERS

WAVERLY DISTRICT, NEWARK

PLAN OF COLLECTION SYSTEM

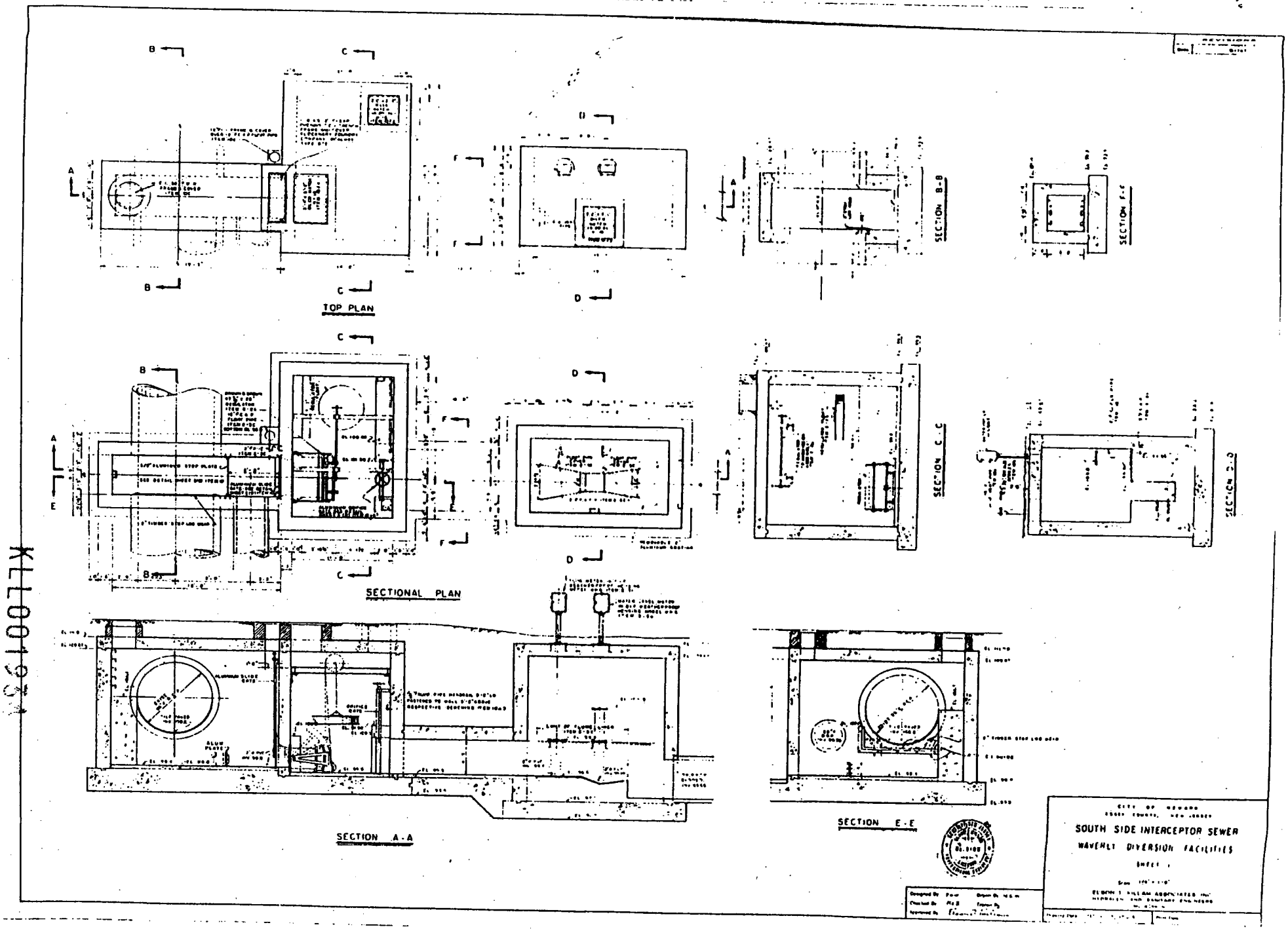
1500 0 1500 3000

SCALE IN FEET

Killam Associates Consulting Engineers

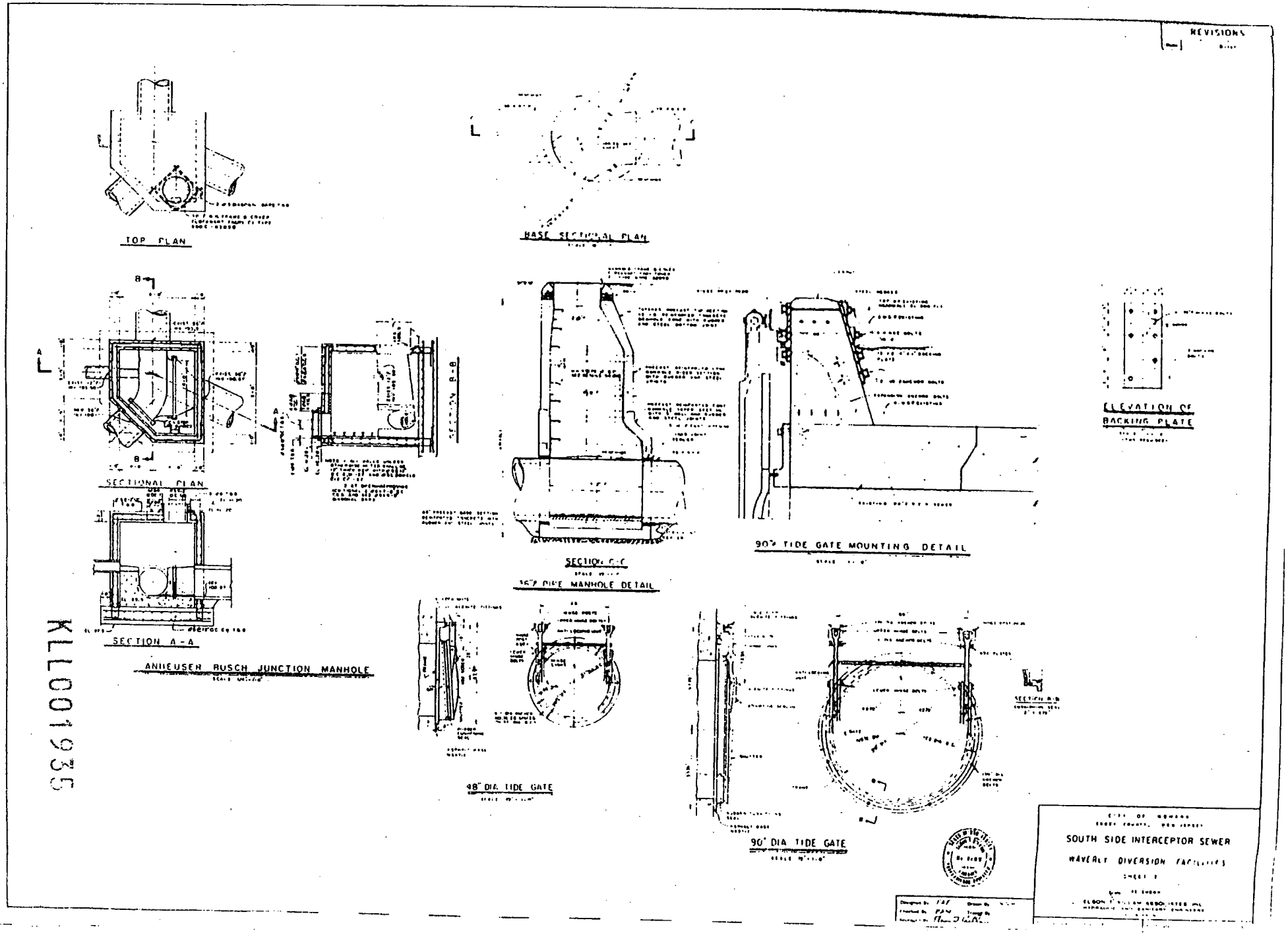
PLATE C

2/23/96



KLL001934

PLATE D-1



KLL001935

PLATE D-2