

1993 - Oahu - FEIS - East Mamala Bay II

**EAST MAMALA BAY
WASTEWATER FACILITIES PLAN**

***F I N A L
E N V I R O N M E N T A L
I M P A C T S T A T E M E N T***

Appendix A

December 1993

FILE COPY

Bay II

**ALA BAY
FACILITIES PLAN**

**A L
MENTAL
ATEMENT
dix A**

1993

**EAST MAMALA BAY
WASTEWATER FACILITIES PLAN**

***F I N A L
ENVIRONMENTAL
IMPACT STATEMENT***

Appendix A

This document is prepared pursuant to
Chapter 343, Hawaii Revised Statutes.

Prepared for:

City and County of Honolulu
Department of Wastewater Management

Prepared by:

Belt Collins Hawaii
680 Ala Moana Boulevard
Honolulu, Hawaii 96813
Phone: (808) 521-5361

December 1993

Table A-1
Improvements to Sewer Lines in Sewered Areas

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE (INCHES)	LENGTH (FEET)	DEFINED PROBLEM B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.	CAPITAL COST \$	LIFE CYCLE COST \$	PRIORITY FOR IMPLEMENTATION
A-4	Salt Lake Boulevard between Likini Place and Wanaka Street	8	220		82,565	433,438	4
		10	370		142,688		
		12	380		161,702		
			970		388,952		
A-4	On Navy Marine Golf Course near Aliamanu Intermediate School	8	1,070		249,265	418,858	4
		10	420		101,258		
			1,490		350,521		
A-5	Along Palea Street near intersection with Ualena Street	8	540		137,234	182,128	4
A-6	Near Lagoon Drive with branches on Koapaka Street and Ualena Street	10	1,020	S	1,219,861	1,278,980	3
A-6	Off Waiwai Loop	8	320		408,862	427,853	4
A-6	Ohohia Street with branches off on Koapaka Street and Ualena Street	8	1,480		340,119	633,788	4
		10	790		190,457		
			2,250		530,578		
A-7	Likini Street between Ala Nanala and Ala Nanu	10	1,300	S	313,410	448,022	3
		18	180		64,361		
			1,480		377,771		
A-7	Near intersection of Ala Ilima and Ala Lilikoi	8	1,330	S	309,834	370,795	3
A-7	Ala Ilima between Ala Nanu and Ala Napuaa Place	10	510		134,131	157,699	4
A-8	Intersection of Ahua Street and Pukoloa Street	10	300	B & S	391,399	408,191	2
A-8	Paa Street and Mapunapuna Street	8	750	B & S	174,719	408,604	2
		10	230		55,449		
		12	420		112,064		
			1,400		342,232		
A-8	Across Moanalua Stream between Kikowana Place and Ahua Street	8	800		768,841	802,225	4
A-9	Along Lunalilo Freeway and into Moanalua Valley	15	3,290		4,489,370	4,866,714	4
A-10	Along Lunalilo Freeway	18	3,630		1,833,855	2,012,859	3
A-11	Sand Island Access Road and Pahoumii Drive	10	90		117,420	122,757	3
A-11	Puuhale Road and Auiki Street	10	1,280		1,530,808	3,905,522	4
		12	850		1,071,811		
		15	260		353,203		
			2,390		2,955,819		
A-12	Mokauea Street and Auiki Street Kalihii Street to Kalani Street with branches to Puuhale Street and Mokauea Street Auiki Street off Nimitz Highway	8	470	C & S	500,577	7,119,997	2
		12	850		974,373		
		15	2,530		732,058		
		18	1,250		408,322		
		18	180		233,377		
		24	2,680		3,847,602		
	7,960		6,694,309				
A-12	Kalani Street and McNeil Street	8	580	B, C & S	135,116	354,005	1
		10	670		161,527		
			1,250		296,642		
A-12	Between McNeil Street and Kaunualii Street	21	185	B	83,643	82,633	2

Table A-1
Improvements to Sewer Lines in Sewered Areas

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE (INCHES)	LENGTH (FEET)	DEFINED PROBLEM B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.	CAPITAL COST \$	LIFE CYCLE COST \$	PRIORITY FOR IMPLEMENTATION
A-12	Ahulia Street	10	510	B, C & S	134,131	157,699	1
A-12	Stanley Street	10 12	380 150 530	S	89,941 43,661 143,602	188,148	3
A-12	Dillingham Street and Kalihi Street with branches to Kahanu Street and King Street	8 10 12 15 18	1,280 1,370 300 2,870 500 6,100	B, C & S	394,059 440,289 108,383 1,107,893 228,834 2,278,237	2,588,608	1
A-12 & A-14	Along Nimitz Highway between Waiakamilo Road and Hart Street Pump Station	48	1,770		5,988,063	8,137,254	1
A-13	Off Umi Street	15	1,620	B & S	515,823	591,614	2
A-13	Off Owen Street	8	500	S	127,068	150,118	3
A-13	King Street and Lunalilo Freeway	10	880	B	228,181	265,824	2
A-13	Off Umi Street along King Street	10	580	S	152,541	179,344	2
A-13	Richard Lane across Lunalilo Freeway	10	1,200	S	289,302	344,427	3
A-13	Lunalilo Freeway between Gulick Avenue and Nakuina Street	8 21	100 280 380	S	25,414 117,553 142,968	180,210	3
A-13	Off Amelia Street towards Freeway	15	1,030	S	327,834	376,150	3
A-13	Eluwene Street between Laumaka Street and Puhale Road	12	220		64,038	74,281	4
A-14	Halona Street, Kohou Street, Houghtailing Street up to Peter Buck Street	8 10 12	720 1,350 870 2,940	S	843,525 1,814,522 1,097,030 3,555,077	3,725,911	3
A-14	Moowaa Street and Kaumalii Street Intersection	8	1,370		1,605,041	1,883,999	4
A-14 & A-21	Auld Lane from Lunalilo Freeway to Noble Lane	10 18	425 200 625		163,898 110,224 274,120	304,382	3
A-15	Makuhine Street between Hala Drive and School Street	8	275	S	103,206	116,303	3
A-15	Intersection of Amelia Street and School Street	15	540	S	187,499	213,028	3
A-15	Along School Street between Gulick and Makuhine Street	8 10 12	100 500 505 1,105		34,402 176,750 198,885 408,137	460,680	4
A-15	Kalihi Street down to Gulick Avenue and Ulana Street Intersection	8 10 21	2,000 510 360 2,870	C & S	485,916 122,953 149,202 738,071	870,482	3
A-15	Along Kalihi Stream between Gulick Avenue and Jennie Street	18	3,450	S	1,233,595	1,397,130	3
A-15	Along School Street and Intersection with Kapalama Avenue	15	230		114,524	125,832	4

Table A-1
Improvements to Sewer Lines in Sewered Areas

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE INCHES	LENGTH (FEET)	DEFINED PROBLEM	CAPITAL COST \$	LIFE CYCLE COST \$	PRIORITY FOR IMPLEMENTATION
				B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.			
A-16	Kalihi Street	18	4,500	S	1,809,037	1,822,344	3
A-17	Kalihi Street and Uluiki Street	8	60		15,248	18,014	4
A-17	Kalihi Street	8	800	S	188,387	1,508,775	3
		18	3,170		1,133,477		
			3,970		1,319,844		
A-18	Iwilei Street to Pacific Street intersecting Nimitz Highway meeting Sumner, Pine and Kuwili Street	8	210	S	330,192	15,028,714	2
		12	200		337,883		
		15	1,630		2,958,298		
		18	270		512,631		
		21	2,380		4,832,308		
		30	350		855,863		
		38	1,350		3,633,630		
		42	380	1,092,515	14,553,299		
			6,770				
A-18	Intersection of Beretania Street and King Street continuing down to College Walk	8	1,400	S	2,421,411	10,092,281	2
		10	400		705,376		
		18	1,380		2,882,126		
		21	1,880		3,752,144		
			4,860		9,781,058		
A-18	Dillingham Boulevard and King Street to Pua Lane	12	800	S	351,083	1,075,950	2
		15	1,350		618,188		
			2,250		987,250		
A-18	Nimitz Highway from Kooka Street to College Walk	8	250		432,395	12,295,853	1
		10	40		70,538		
		36	30		88,822		
		42	3,600		11,385,154		
			3,920		11,978,808		
A-18	Off Vineyard near Kauluwela School	8	260		68,075	78,062	4
A-18	Sereno Lane	8	1,075	C & S	250,430	299,703	3
A-18	Intersection of Judd Street and Bachelot Street	8	170	S	43,203	51,040	3
A-18	Huna Street	8	440	S	111,820	132,105	3
A-18	Lunalilo Freeway	8	470	S	178,388	388,539	3
		18	80		44,090		
		30	130		114,672		
			680		335,149		
A-18	Off Bates Street	8	170		43,203	51,040	4
A-20	Intersection of Pacific Heights Road and Pauoa Road	8	25		8,353	7,508	4
A-20	Nuuanu Avenue and Kuakini Street	8	80		278,587	314,209	4
A-21	Vineyard Boulevard between Palama Street and Auld Lane	10	725	S	278,587	214,209	3
A-21	Lanakila Avenue between Kuakini Street and School Street	8	600		152,482	180,143	4
A-21	Makanani Drive between Aulii Street and School Street	8	240		60,993	133,900	4
		10	200		52,600		
			440		113,593		
A-21	Along Ilima road near Kalihi Stream	8	190		48,288	57,045	4

Table A-1
Improvements to Sewer Lines in Sewered Areas

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE (INCHES)	LENGTH (FEET)	DEFINED PROBLEM B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.	CAPITAL COST \$	LIFE CYCLE COST \$	PRIORITY FOR IMPLEMENTATION
A-21	Off Mamala Street between Malua Street and Alawa Drive	8	250		53,834	75,059	4
A-22	Houghtailing Street and Kealia Drive	8 12	165 70 235	S	41,932 20,375 62,308	73,174	3
A-23	Off Wood Street	10	230		60,490	71,118	4
A-23	Off Wylie Street	8	280		71,158	84,087	4
A-24	Fort Street between Vineyard Boulevard and Queen Street	8 15	1,330 200 1,530	C & S	309,834 63,657 373,492	443,834	1
A-24	Nuuanu Avenue and Kukui Street down to River Street	8 10 12	300 480 820 1,600	B & S	69,887 115,721 218,791 404,399	478,134	1
A-24	River Street from Lunalilo Freeway and down to Nimitz Highway	8 10 15 18 21 36	530 640 190 660 1,100 280 3,380	C & S	620,928 765,403 258,110 941,288 1,685,019 527,183 4,797,909	5,003,245	1
A-24	Along Ala Moana Boulevard and Nimitz Highway between Punchbowl Street and Bethel Street	21 24 36	240 550 2,550 3,340	B	536,021 1,265,827 7,549,877 9,351,524	8,612,382	1
A-24	Alakas Street between Ala Moana Boulevard and Kukui Street	8 10 12 15 18	1,130 740 300 310 1,300 3,780		1,954,424 1,304,845 557,474 618,883 2,715,048 7,150,773	7,402,847	3
A-24	Nuuanu Avenue and Kaula Lane intersection	10	100	S & P	38,584	43,339	2
A-24	Nuuanu Avenue and Lunalilo Freeway	8	620		232,682	282,210	4
A-24	Beretania Street Between Smith Street and Mauna Kea Street	8	230		86,318	97,271	4
A-24	Along Lusitania Street and Kamamalu Avenue	8 18	220 170 390		55,910 86,312 122,222	140,492	4
A-24 & A-25	From Halekauwila Street and Richards Street down Queen Street and Punchbowl Street	8 10 12	875 825 190 1,890	S	1,513,382 1,454,837 353,067 3,321,288	3,444,128	1
A-25	Ala Moana Pump Station	21	130		217,242	225,551	1
A-25	MidBlock Between Alapai Street & Punchbowl Street	15 18	370 710 1,080	B, S & P	738,687 1,482,833 2,221,500	2,295,764	1

**Table A-1
Improvements to Sewer Lines in Sewered Areas**

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE (INCHES)	LENGTH (FEET)	DEFINED PROBLEM	CAPITAL COST \$	LIFE CYCLE COST \$	PRIORITY FOR IMPLEMENTATION
				B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.			
A-25	Ala Moana Boulevard between Punchbowl Street and Ward Avenue	15	30	B, S & P	59,892	11,138,005	1
		21	80		178,674		
		36	1,330		3,937,779		
		42	<u>2,110</u>		8,872,885		
			3,550		10,849,309		
A-28	Intersection of Punchbowl Street and Beretania Street	8	830	B & S	216,732	591,220	1
		10	<u>860</u>		304,010		
			1,490		520,743		
D							
A-28	Makai Intersection of Lusitana Street and Lunalilo Freeway	8	105		39,408	44,408	4
A-28	Alapai Street and Beretania Street	10	780	B & S	275,730	579,770	1
		12	<u>810</u>		237,842		
			1,390		513,673		
A-28	King Street	30	880	S	711,552	881,308	2
		36	<u>220</u>		210,863		
			1,100		922,514		
A-28	Kinau Street	10	320	S	123,404	271,345	3
		12	<u>280</u>		119,149		
			600		242,552		
A-27	Ala Moana Boulevard and Kamakee Street	36	200	C & P	592,147	4,112,991	2
		42	<u>1,080</u>		3,415,548		
			1,280		4,007,693		
A-27	Ala Moana Boulevard near Ala Moana Shopping Center	8	20		37,738	39,089	4
*A-28	Kapiolani Boulevard Diversion and Relief between Kamakee Street and Atkinson Drive to Kahakai Drive	10	440	B, C & P	775,913	12,208,540	2
		12	380		688,989		
		42	<u>3,300</u>		10,438,391		
			4,100		11,881,273		
A-28	Kalaokalani Way	10	670	B, C, S & P	874,125	913,861	1
A-28	Atkinson Drive and Ala Moana Boulevard	8	300	C & S	568,044	1,043,925	2
		10	<u>230</u>		442,483		
			530		1,008,507		
A-28	Keeaumoku Street between Rycroft Street and Ala Moana Boulevard	10	660		1,163,870	2,927,652	4
		12	150		278,737		
		21	570		1,273,049		
		24	<u>50</u>		115,057		
			1,430		2,830,713		
A-28	Punahou Street and Beretania Street	8	270	B & C	101,329	114,188	2
A-29	Beretania Street and Keeaumoku Street	8	160	B	80,047	318,034	2
		10	<u>580</u>		223,669		
			740		283,716		
A-29	Beretania Street between Piikoi Street and Victoria Street	10	710	B, C & S	250,985	573,605	2
		12	<u>860</u>		257,448		
			1,370		508,531		
A-29	Piikoi Street between Beretania Street and Kapiolani Boulevard	8	410	B, C, S & P	709,127	4,919,989	1
		10	400		705,376		
		12	830		1,542,348		
		18	<u>860</u>		1,796,108		
			2,500		4,752,956		

Table A-1
Improvements to Sewer Lines in Sewered Areas

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE (INCHES)	LENGTH (FEET)	DEFINED PROBLEM B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.	CAPITAL COST	LIFE CYCLE COST	PRIORITY FOR IMPLEMENTATION
A-29	King Street between Ward Avenue and Keamoku Street	18 30	3,380 330 3,710	B, P & S	1,707,558 268,832 1,974,388	2,158,391	1
A-29	Kalakaua Holmes between Kalakaua Circle and Kanunu Street	21	20	B & S	33,422	34,700	2
A-29	Rycroft Street and Keamoku Street	8 10	220 460 680	S	55,910 120,881 178,891	208,291	3
A-29	Kaheka Street and Kanunu Street	8 10	315 220 535	B	402,592 287,028 689,618	721,242	2
A-29	Makaloa Street and Kaheka Street	12	30	B, S & P	60,815	62,887	2
A-29	Kalakaua Circle	8	400		511,227	534,818	4
A-30	Liholiho Street and Wilder Avenue	8 10	270 200 470	B & S	68,817 52,600 121,217	142,907	2
A-30	Nehoa Street and Auwailimu Street	15	80		27,778	31,559	4
A-30	Lunalilo Freeway between Kewalo Street and Pensacola Street	8 10	1,800 650 2,450		619,235 229,775 849,011	984,805	4
A-30	Intersection of Keamoku Street and Moku Place	8	215		80,688	90,928	4
A-30	Spencer Street between Emerson Street and Magazine Street	8	650		165,189	195,155	4
A-30	Intersection of Ward Avenue and Spencer Street	8	650		319,000	358,481	4
A-31	Anianiku Street	8 10	120 125 245		30,498 32,875 63,372	74,680	4
A-32 & A-33	Ala Moana Boulevard and Kalakaua Avenue W	21	1,300		2,903,444	2,995,720	3
A-32 & A-33	Holbron Lane and Ena Road W	8	400	S & P	511,227	534,818	1
A-32 & A-33	Fort DeRussy off Kalia Road W	18	1,830	B & S	2,609,931	2,721,257	1
A-32 & A-33	Midblock between Keoniana Street and Kuamoo Street W	8	280		71,158	84,087	3
A-33	From Beachwalk Wastewater Pump Station along Lawers Street W	21	650		1,583,697	1,631,494	3

Table A-1
Improvements to Sewer Lines in Sewered Areas

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE INCHES	LENGTH FEET	DEFINED PROBLEM	CAPITAL COST †	LIFE CYCLE COST †	PRIORITY FOR IMPLEMENTATION
				B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.			
A-33	Ena Road and Kalakaua Avenue W	8	40	S	51,123	53,482	1
A-33	Between McCully Avenue and Kalakaua Avenue W	8	220	S	281,175	284,149	1
A-33	Kaiolo Drive and Hobron Lane W	10 12	700 <u>300</u> 1,000	B, C & P	837,160 <u>378,288</u> 1,215,448	1,273,831	1
A-33	On Hobron Lane from Kaiolo Drive to Ala Moana Boulevard W	10	400	B, C, S & P	521,866	545,588	1
A-33	Kalakaua Avenue and Ala Wai Boulevard W	21	30	S	73,094	75,300	1
A-33	Kaiolu Street from Kuhio Avenue to Kalakaua Avenue down to Saratoga Road W	8 10	100 <u>1,250</u> 1,350	B & S	172,958 <u>2,204,299</u> 2,377,257	2,485,084	1
A-33	Midblock between Beach Walk and Lewers Street W	8	450	B, C & S	575,131	601,668	1
A-33	Kalia Road and Beach Walk up to Lewers Street W	8 10	275 <u>550</u> 825	S	351,489 <u>717,585</u> 1,069,034	1,117,870	1
*A-33	Beachwalk WWPS to Ala Wai siphon crossing W	24	800		1,550,528	1,608,833	1
A-33	Midblock between Kalaimoku Street and Launiu Street	8	250		318,517	334,260	3
A-33	Midblock between Olohana Street and Kalaimoku Street W	8	280		357,859	374,371	4
A-33	Midblock between Namahana Street and Olohana Street	8	360		460,105	481,335	3
A-33	Midblock between Kuamoo Street and Namahana Street W	8	270		68,817	81,084	3
A-33	Pea Pea Place W	8	300		383,421	401,112	3
A-33	Ala Moana Boulevard between Hobron Lane and Kalia Road W	21	250		809,114	827,498	3

Table A-1
Improvements to Sewer Lines in Sewered Areas

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE (INCHES)	LENGTH (FEET)	DEFINED PROBLEM B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.	CAPITAL COST 1	LIFE CYCLE COST 2	PRIORITY FOR IMPLEMENTATION
A-33	Niu Street to Kalakoua Avenue to Pau Street W	8	340		641,517	1,830,882	3
		15	430		838,492		
			770		1,578,008		
A-34	Punahoa Street between Date Street and Kapiolani Boulevard	10	875	B, C, S & P	1,141,581	1,193,475	3
A-34	McCully Street Between King Street and Kapiolani Boulevard	10	1,320		468,621	528,123	3
A-34	Isenberg Street between King Street and Date Street	8	200	S & P	255,614	287,408	2
A-34	Coolidge Street	8	830	S & P	1,188,804	1,243,488	2
A-34	Kalakoua Avenue	8	270	B, C, S & P	468,986	2,038,877	1
		10	850		1,488,923		
			1,120		1,985,910		
A-34	Kukahi Street from Punahou Street to Hauuli Street	8	325	C & S	415,372	1,334,759	2
		10	660		861,078		
			985		1,278,4451		
A-34	Hauuli Street between Malanai Street and Lime Street	8	565	B & P	681,933	1,697,602	3
		10	800		958,754		
			1,365		1,618,687		
A-34	Washington Intermediate between King Street and Waiola Street	8	380	B, S & P	98,572	175,933	2
		10	200		52,600		
			580		148,172		
A-34	Between McCully Street and Young Street to King Street and Kamole Lane	10	80	B, S & P	23,138	282,897	1
		12	500		212,765		
			560		235,803		
A-34	Punahou Street between King Street and Beretania Street	12	640	S	272,339	303,223	3
A-34	Young Street and Isenberg Street up to Coyne Street	8	1,000	C & S	344,020	610,367	2
		10	350		123,725		
		12	180		70,213		
			1,530		537,957		
*A-34	Midblock between Coyne Street and Beretania Street from University Avenue	8	500	B, S, C, & P	585,781	1,628,087	1
		12	500		830,477		
		15	250		339,618		
			1,250		1,555,878		
A-34	Puck's Alley along King Street	8	370	C, S & P	698,211	1,239,443	2
		10	220		423,225		
		15	35		76,228		
			625		1,197,572		
A-34	Kulei Lane and Kahuna Lane	8	480	B, S & P	613,473	1,088,873	2
		12	310		428,432		
			790		1,039,905		
A-34	University Avenue, Date Street and Kapiolani Boulevard	8	390	B, S & P	674,538	1,907,998	2
		10	100		178,344		
		12	270		501,727		
		15	245		489,117		
			1,005		1,841,724		
A-34	Hauken Street	8	550	C & P	702,938	735,373	2

Table A-1
Improvements to Sewer Lines in Sewered Areas

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE (INCHES)	LENGTH (FEET)	DEFINED PROBLEM	CAPITAL COST \$	LIFE CYCLE COST \$	PRIORITY FOR IMPLEMENTATION
				B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.			
A-34	Wiliih Street between Date Street and Line Street	8	570	S & P	728,499	782,113	2
A-34	Date Street between Hauoli Street and Houston Street	10 15 18	415 2,500 845 <u>3,780</u>	P	731,827 4,990,893 <u>1,784,780</u> 7,487,601	7,743,050	4
A-34	Date Street and Kapiolani Boulevard	48	215	S	793,223	812,418	4
A-34	Hauoli Street between Citron Street and Waiola Street	8	280		357,859	374,371	4
A-34	Citron Street between Hauoli Street and Isenberg Street	10 15	1,325 <u>1,210</u> 2,535		1,584,823 <u>1,643,750</u> 3,228,374	3,377,724	4
A-34	Fern Street and Paani Street	8	420		538,789	581,557	4
A-34	Intersection of McCully Street and Kapiolani Boulevard	10	320		615,601	637,089	3
A-34 & A-37	Along Alexander Street	12	305		88,788	102,880	4
A-35	Hunnewell Street	8	420	C	106,737	128,100	4
A-35	Metcalf Street from Marques Street to University Avenue	8 12	270 <u>910</u> 1,180	S	82,899 <u>242,805</u> 305,703	380,178	3
A-38	Lunalilo Freeway and Punahou Street	10	1,380		332,697	398,091	4
A-37	Anapuni Street and Wilder Street	8	820		307,741	348,793	4
A-37	Dominis Street	18	80		31,208	35,030	4
A-37	Intersection of Wilder Avenue and Makiki Street	8	35		13,135	14,802	4
A-38	Kamehameha Avenue	8	550	S	139,775	165,131	3
A-38	Along East-West Road from St. Francis High School to University of Hawaii	12 18	1,110 <u>650</u> 1,780	B & S	298,168 <u>232,418</u> 528,585	610,748	2
A-38	Corner of Oahu Avenue and Kaala Avenue to East-West Road	15	1,780	S	589,732	653,897	3
A-38	Keala Place	8	90		22,287	27,021	4
A-38 & A-39	Oahu Avenue from Kaala Way to Halelana Place	10	2,850	S	687,091	818,013	3
A-39	Woodlawn Drive	8 15	150 <u>1,750</u> 1,900	B & S	34,944 <u>557,000</u> 591,944	680,908	2
A-39	Manoa Marketplace	8	1,310	S	305,175	365,219	3
A-39	Lowray Avenue from Manoa Road to Woodlawn Drive	8 12 15 18 21	1,820 230 750 150 <u>250</u> 3,000	S	377,392 81,388 238,714 53,835 <u>103,812</u> 834,722	973,935	3

Table A-1
Improvements to Sewer Lines in Sewered Areas

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE (INCHES)	LENGTH (FEET)	DEFINED PROBLEM B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.	CAPITAL COST \$	LIFE CYCLE COST \$	PRIORITY FOR IMPLEMENTATION
A-39	Parallel to Lowery Avenue and between Woodawn Drive and Kalawao Road	8	530	S	134,892	159,128	3
A-40	Along Manoa Stream near Lowrey Avenue	8 15	820 330 1,150		191,028 105,034 296,060	349,125	4
A-40	Off Manoa road	8	2,100		487,313	582,927	4
A-40	Off Akaka Place	8	110		27,955	33,026	4
A-40	Manoa Road from Halelani Drive to Lowrey Avenue	8	700	S	177,895	210,168	3
A-40	Woodawn Drive and Waipuna Rise	15	120	S	41,667	47,339	3
A-40	Along Kuhio Avenue	21	90		219,281	225,899	3
A-41	Along Kuhio Avenue between Kaiolu Street and Lowers Street	8	180		339,628	351,819	3
A-41	Intersection of Kuhio Avenue and Nohonani Street	21	25		60,911	82,750	3
A-41 & A-42	Koa Avenue and Ulu Niu Avenue down to Kuhio Avenue and Kaiulani Avenue W	8 15 21	890 30 320 1,040	B	1,193,410 59,892 714,894 1,967,995	2,037,294	1
A-41 & A-42	Kaiulani Avenue and Kalakoua Avenue down to Kuhio Avenue W	10 12 15 18 24	80 385 470 200 250 1,385	S	141,075 715,425 938,307 417,899 575,285 2,787,782	2,882,280	1
A-41 & A-42	Midblock between Nohonani Street and Nahua Street W	8	295	C & S	377,030	394,427	1
A-41 & A-42	Ala Wai Boulevard from Lowers Street down Kanekapolei Street to Kuhio Avenue W	18	2,850		5,534,517	5,717,790	3
A-41 & A-42	Seaside Avenue down Kuhio Avenue to Nohonani Street W	12 21	610 300 910		1,236,579 730,937 1,967,516	2,031,294	4
A-42	Kuhio Avenue W	21	150		365,489	376,499	3
A-42	Lemon Road W	8	420	B & S	536,789	581,557	1
A-42	Cartwright Road W	8	485	B, C & S	819,863	848,465	1

**Table A-1
Improvements to Sewer Lines in Sewered Areas**

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE (INCHES)	LENGTH (FEET)	DEFINED PROBLEM B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.	CAPITAL COST \$	LIFE CYCLE COST \$	PRIORITY FOR IMPLEMENTATION
A-42	From Kapahulu Avenue and Kalakaua Avenue to intersection of Ohua Avenue and Kuhio Avenue W	18 21	1,350 25 <u>1,375</u>	B, C & S	1,925,359 38,298 <u>1,953,655</u>	2,047,335	1
A-42	Kealahilani Avenue W	8 15	250 450 <u>700</u>	B & S	319,517 668,886 <u>988,403</u>	1,028,837	1
A-42	Tusitala Street and Kaiulani Avenue W	8	180	B	230,052	240,867	1
A-42	Ala Wai Boulevard and Kaiulani Avenue W	8	180	B	48,286	57,045	1
A-42	Walua Street W	8	370	S	472,885	494,705	1
*A-42	Midblock between Seaside Avenue and Nohonani Street W	8	200	C	255,814	267,408	1
A-42	Lewers Street and Aloha Drive W	15	650	C & S	983,280	1,003,278	1
A-42	Helunoa Road W	8	180	B & S	230,052	240,867	1
A-42	Kalia Road W	10 18	340 330 <u>670</u>	B, C & S	443,586 513,429 <u>957,015</u>	897,782	1
A-42	Midblock between Ala Wai Boulevard and Aloha Drive W	8 15	200 110 <u>310</u>	S	50,827 38,194 <u>89,022</u>	103,442	1
A-42	Lewers Street from Kalia Road to Kuhio Avenue to Beachwalk WWPS W	10 18 21 24 42 48	180 440 1,180 100 170 <u>100</u> 2,150	S & B	317,419 918,939 2,590,766 230,114 537,632 <u>338,186</u> 4,933,065	5,087,324	1
A-42	Liliuokalani Avenue and Ala Wai Boulevard W	8	340		434,543	454,594	4
A-42	Intersection of Liliuokalani Avenue and Kuhio Avenue W	21	20		48,729	50,200	3
A-42	Intersection of Kalakaua Avenue and Lewers Street	8 10	50 <u>175</u> 225		94,341 <u>354,756</u> 449,097	484,398	3

Table A-1
Improvements to Sewer Lines in Sewered Areas

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE (INCHES)	LENGTH (FEET)	DEFINED PROBLEM B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.	CAPITAL COST	LIFE CYCLE COST	PRIORITY FOR IMPLEMENTATION
A-42	Intersection of Kalakaua Avenue and Kanekapoiei Street	8	125		235,852	244,180	3
A-43	University of Hawaii @ Manoa Quarry	8	230	B & S	58,451	68,055	2
A-43	University Avenue between Ala Wai Park and Ala Wai Elementary School and Beretania Street	8	150	S	283,022	293,018	2
A-43	Date Street between University Avenue and Kapiolani Boulevard	15	430	S	938,492	986,714	3
A-43	Off Kapiolani Boulevard	8	270		101,329	114,188	4
A-43	Kaaloa Street to Nakookoo Street	8 10	1,100 180 1,280		1,288,719 215,270 1,503,989	1,577,815	4
A-43	Kaimoku Street up to Lauiki Street	8 12 15	1,180 330 80 1,590	B, C, S, & P	1,382,444 418,115 108,878 1,907,237	1,999,433	1
A-44	Kalakaua Avenue between Poni Moi Road and Coconut Avenue	8	215		83,865	94,144	4
A-45	Kalakaua Avenue between Kapahulu Avenue and Poni Moi Road	8 10 12 15	470 770 3,270 100 4,610	C & S	812,802 1,357,848 6,076,470 189,840 8,446,860	8,750,839	1
A-45	Kaneohe Street	10	1,030	B & S	1,816,342	1,883,368	1
A-45	Ohua Avenue and Kuhio Avenue	8	210	B & S	398,231	410,222	1
A-45	Posakalani Avenue from Cartwright Road to Kuhio Avenue	15	250	S	544,472	562,043	1
A-45	Pualani Way	12	300		608,154	628,870	3
A-45	Kapuni Road	8	235		443,401	459,058	3
A-45	Poni Moi Road	12	250		72,769	84,410	4
A-48	Kapahulu Avenue between Kanaina Avenue and Campbell Avenue	10	540	C & S	208,244	234,031	3
A-48	Kapiolani Boulevard near Maunawai Place	8	60	S	22,518	25,375	3
A-48	Date Street down Kapahulu Avenue to H-1 Freeway	10 15	250 650 900		88,409 323,854 420,063	463,960	4
A-48	Lukepane Avenue	10	630		165,048	193,949	4
A-47	Along Manoa/Palolo Drainage Canal	8 10	450 750 1,200	S	104,831 180,813 285,645	340,724	3

Table A-1
Improvements to Sewer Lines in Sewered Areas

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE (INCHES)	LENGTH (FEET)	DEFINED PROBLEM	CAPITAL COST \$	LIFE CYCLE COST \$	PRIORITY FOR IMPLEMENTATION
				B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.			
A-47	Kapiolani Boulevard between Manoa/Palolo Drainage Canal and King Street	12	300	C & S	127,659	142,138	2
A-47	Olokele Avenue between Data Street and Kaimuki Avenue	10	1,080	B & S	280,371	892,168	2
		12	210		58,032		
		15	890		283,274		
		18	130		48,483		
		21	300		124,335		
			2,610	770,498			
A-47	Kaipuu Place	8	250	B	63,534	75,059	2
A-47	Leau Street	8	365		82,760	109,587	4
A-47	Mid-block between Palani Avenue and Makaleka Avenue	10	500		652,332	681,985	4
A-48	Off Waialae Avenue	8	320	S	81,324	98,078	3
A-48	St. Louis Drive between Kaminaka Drive and Alencastre Street	21	70		43,957	47,513	4
A-49	Sixth Avenue	8	260		68,075	78,062	3
A-49	Aloha Avenue	10	520	S	138,781	160,791	3
A-49	Leahi Avenue and Makini Street	24	220		102,718	113,449	4
A-50	Mid-block between Kaimuki Avenue and Charles Street	15	240	B	83,333	94,678	2
A-50	From the intersection of Harding Avenue and 8th Avenue down 8th Avenue to Waialae Avenue between 10th Avenue and 6th Avenue	8 (DC)	1,900		442,821	708,138	4
		8 (DU)	640		149,093		
			2,540		591,714		
A-51	Keanu Street from Sixth Avenue to Tenth Avenue and up Ninth Avenue	8	780	B, C & S	177,048	808,755	2
		10	1,350		325,484		
		12	30		8,005		
			2,140		510,517		
A-51	Wilhelmina Rise	8	130		33,038	39,031	4
A-52	Along Palolo Stream between Kalua Street and Paku Street	8	180	S	41,932	371,648	3
		10	1,120		270,015		
			1,300		311,947		
A-52	Ninth Avenue between Kiwila Street and Paku Street up Kalua Street	8	3,420	S & C	788,717	953,474	2
A-52	Palolo Avenue between Keanu Street	10	40		10,520	32,397	4
		21	40		18,085		
			80		28,605		
A-52	William Place	21	30		13,564	15,021	4
A-52	Pukele Avenue and Hinahina Street	10	100		28,300	78,261	4
		15	120		41,867		
			220		67,967		
A-53	Along Palolo Stream from Kalua Street to Kiwila Street	12	1,925	S	513,625	54,043	2
		18	400		143,025		
			2,325		656,651		
A-53	Kipona Place and Palolo Stream	8	180		45,745	54,043	4
A-55	Along Palolo Stream near Halelaau Place	8	220		55,910	68,052	4
A-55	Along Palolo Stream near Halekipsa Place	8	500		127,068	150,118	4

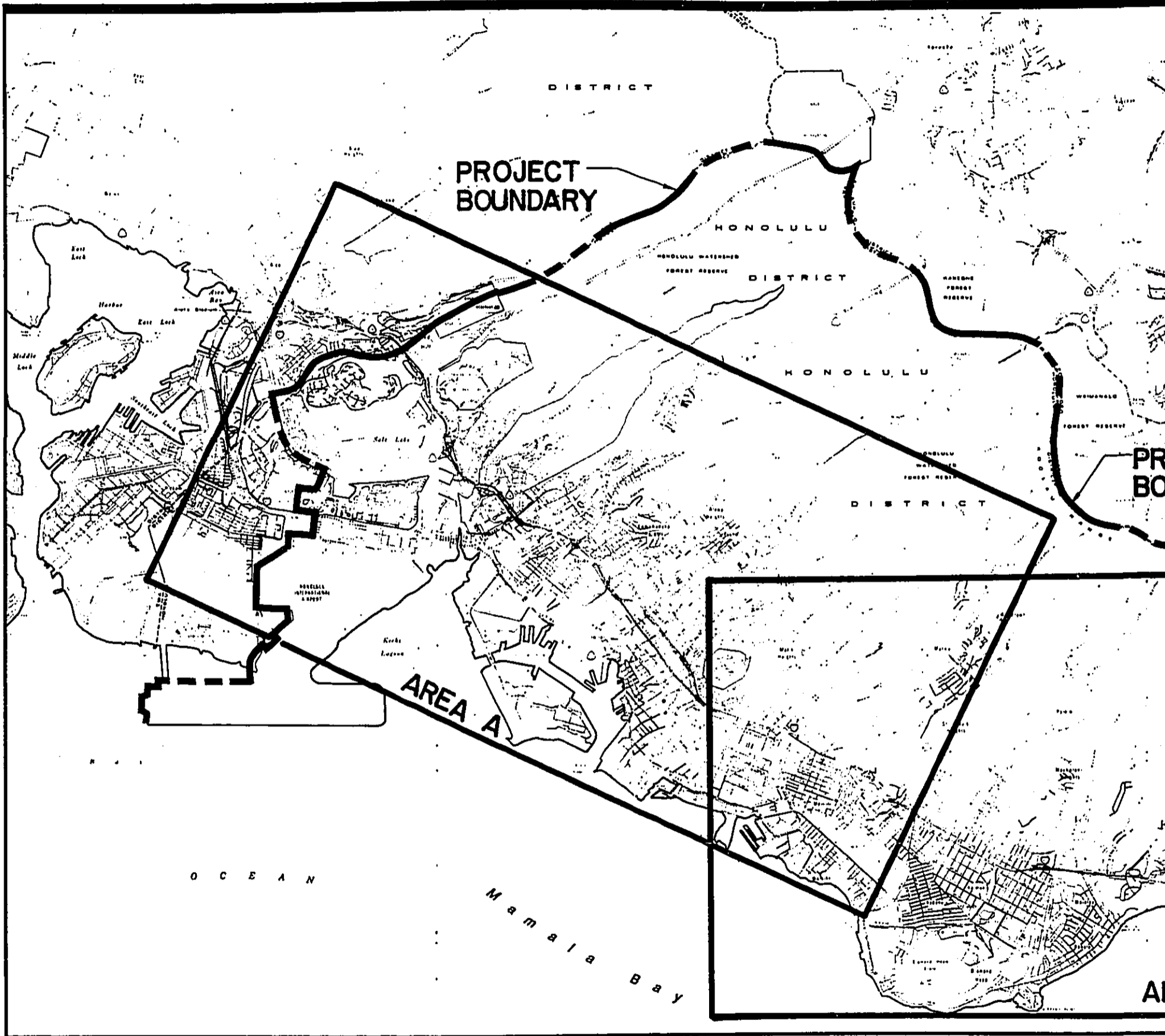
Table A-1
Improvements to Sewer Lines in Sewered Areas

FIGURE NUMBER	LOCATION D - DOWNTOWN W - WAIKIKI	SIZE (INCHES)	LENGTH (FEET)	DEFINED PROBLEM B - BACKWATER EFFECT C - COMPLAINT S - 150% SURCHARGE P - PERIODIC MAINT.	CAPITAL COST \$	LIFE CYCLE COST \$	PRIORITY FOR IMPLEMENTATION
A-56	Corner of Kahala Avenue and Diamond Head Road	8	820		157,564	282,004	4
		10	310		81,530		
			930		239,095		
A-57	Puu Panini to Hunakai Street	8	100	S	23,298	909,037	3
		10	3,070		740,130		
			3,170		763,428		
A-57	Hunakai Street from Kahala Avenue to Ulumaika Street	12	590	S	743,963	2,111,977	3
		15	940		1,278,963		
			1,530		2,020,926		
A-58	Puuo Street from Kahala Ave to Kilauea Avenue	8	510	B & S	587,497	4,466,870	2
		10	510		809,931		
		12	2,425		3,057,813		
			3,445		4,226,241		
A-58	Aukai Avenue between Puoo Street and Koloa Street	8	180	S	242,833	254,038	3
A-58 & A-80	Kealaolu Avenue from Kahala Avenue to Waiatale Avenue & Kilauea Avenue	8	2,050	B & S	477,584	1,822,007	2
		12	480		128,073		
		15	2,485		784,575		
			4,895		1,380,212		
A-81	Along drainage canal off Mala Street	8	430		109,278	129,102	4
A-82	Corner of Sierra Drive and Mikahala Way	8	180		45,745	54,043	4
A-83	Intersection of Kalaniana'ole Highway and Puukena Drive; Puukena Drive	8	130	S	33,038	238,928	3
		10	640		168,321		
			770		201,359		
A-83	West Hind Drive	10	1,030		248,317	285,833	4
A-84	Sand Island Parkway near Sand Island WWTP	15	70		24,305	77,971	3
		18	115		44,858		
			185		69,163		

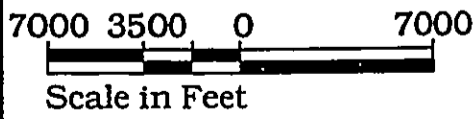
TOTAL CAPITAL COST: \$270.4 million

TOTAL LIFE CYCLE COST: \$284.8 million

* Represents projects which include portions of CIP projects or projects that are a part of CIP projects or projects that are a part of CIP projects.



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



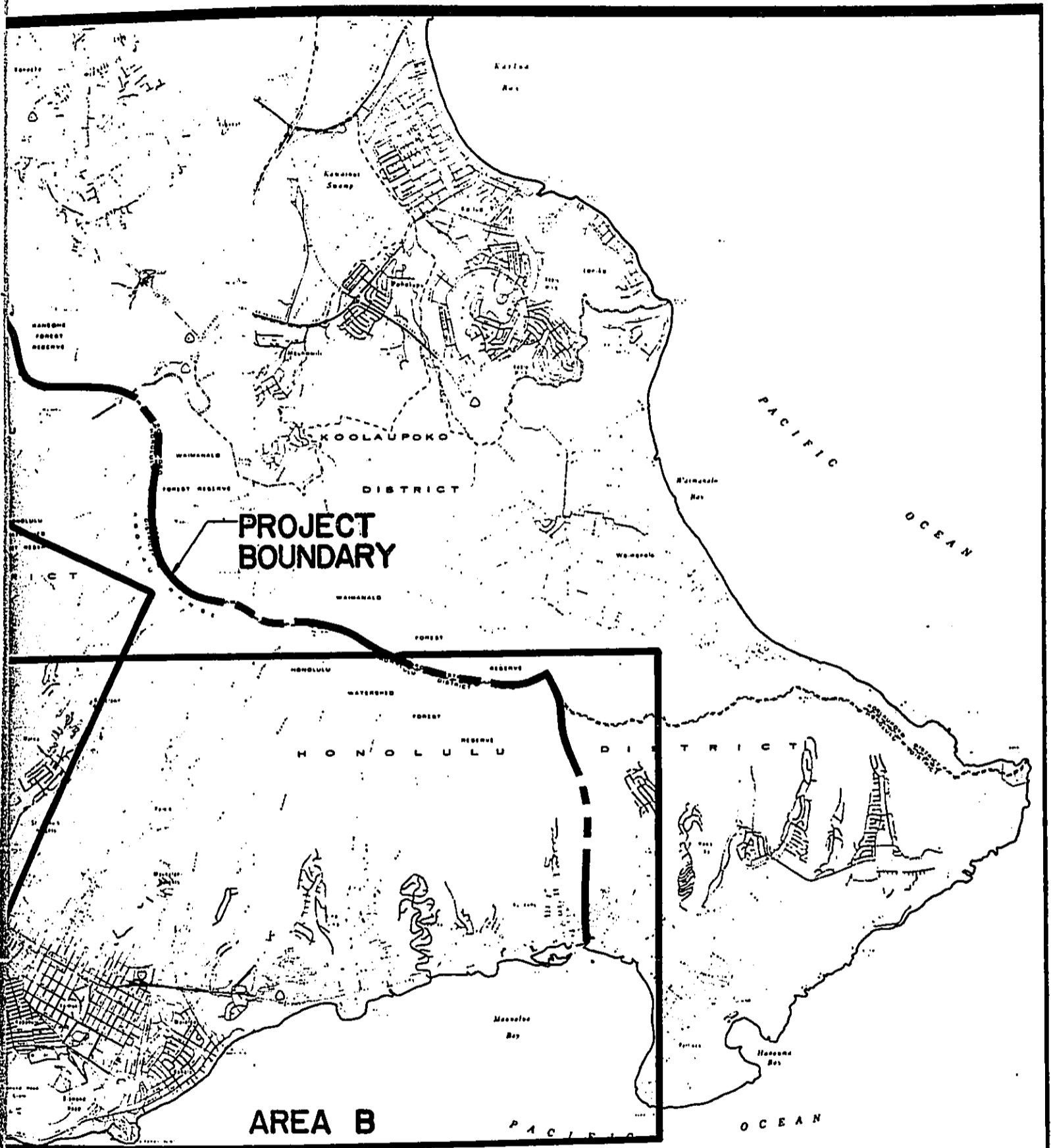
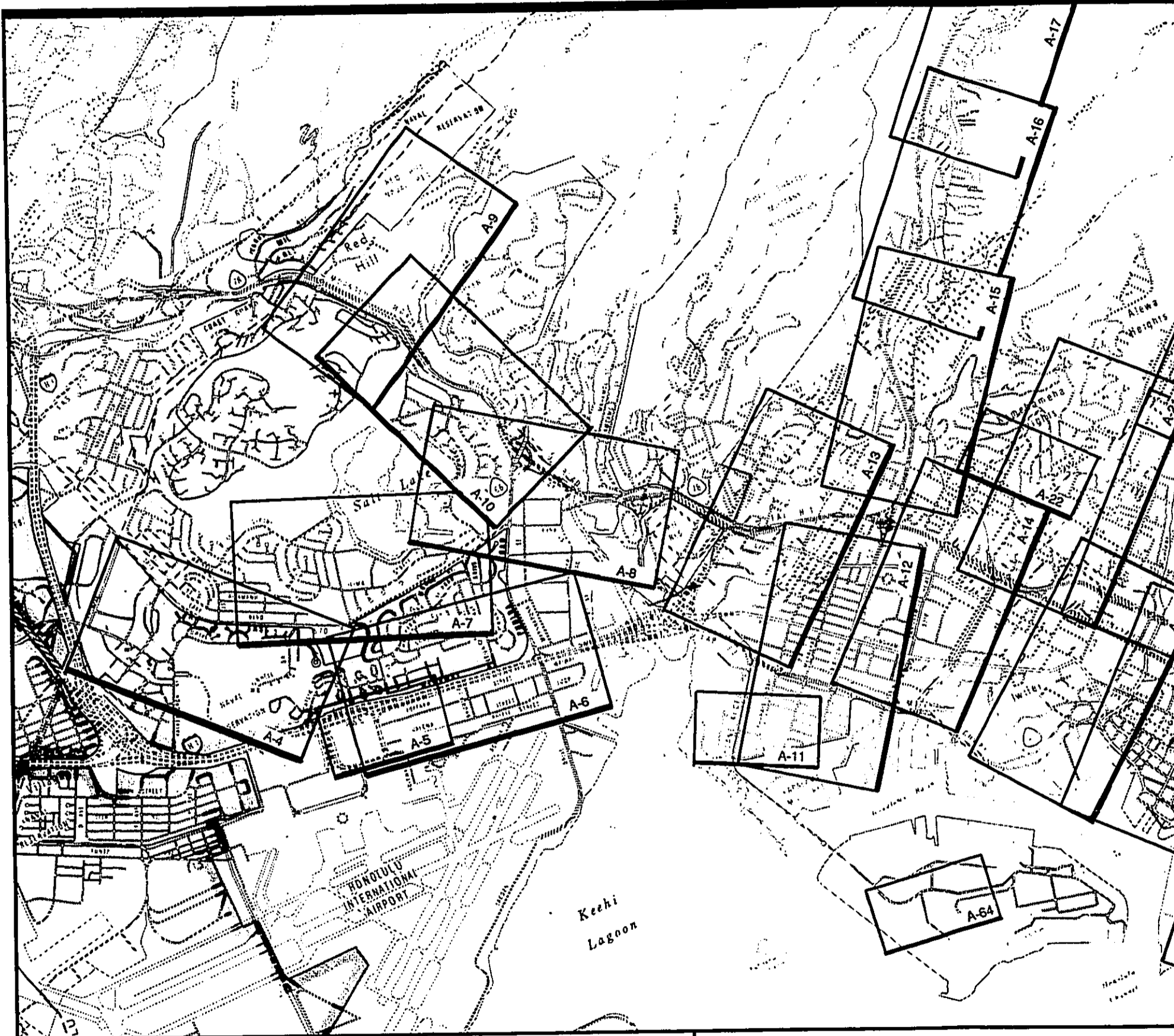


Figure A-1
 Relief Sewers
 Project Area Key Map



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT

BELT COLLINS HAWAII • DECEMBER 1993



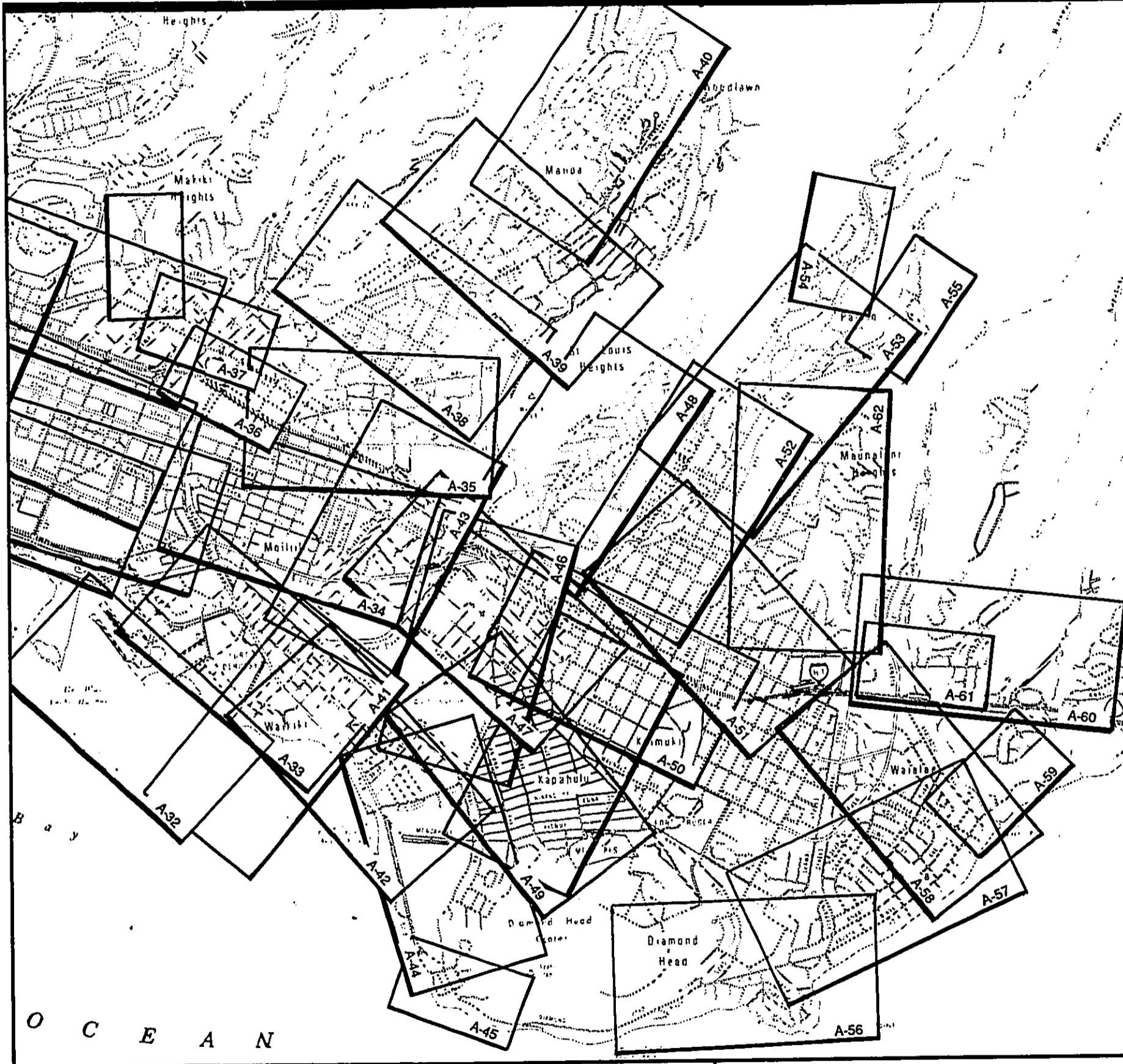
Scale in Feet



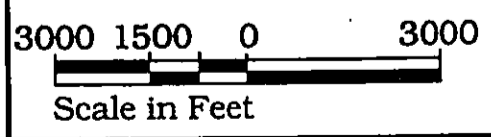
North



Figure A-2
Relief Sewers
Key Map - Area A



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



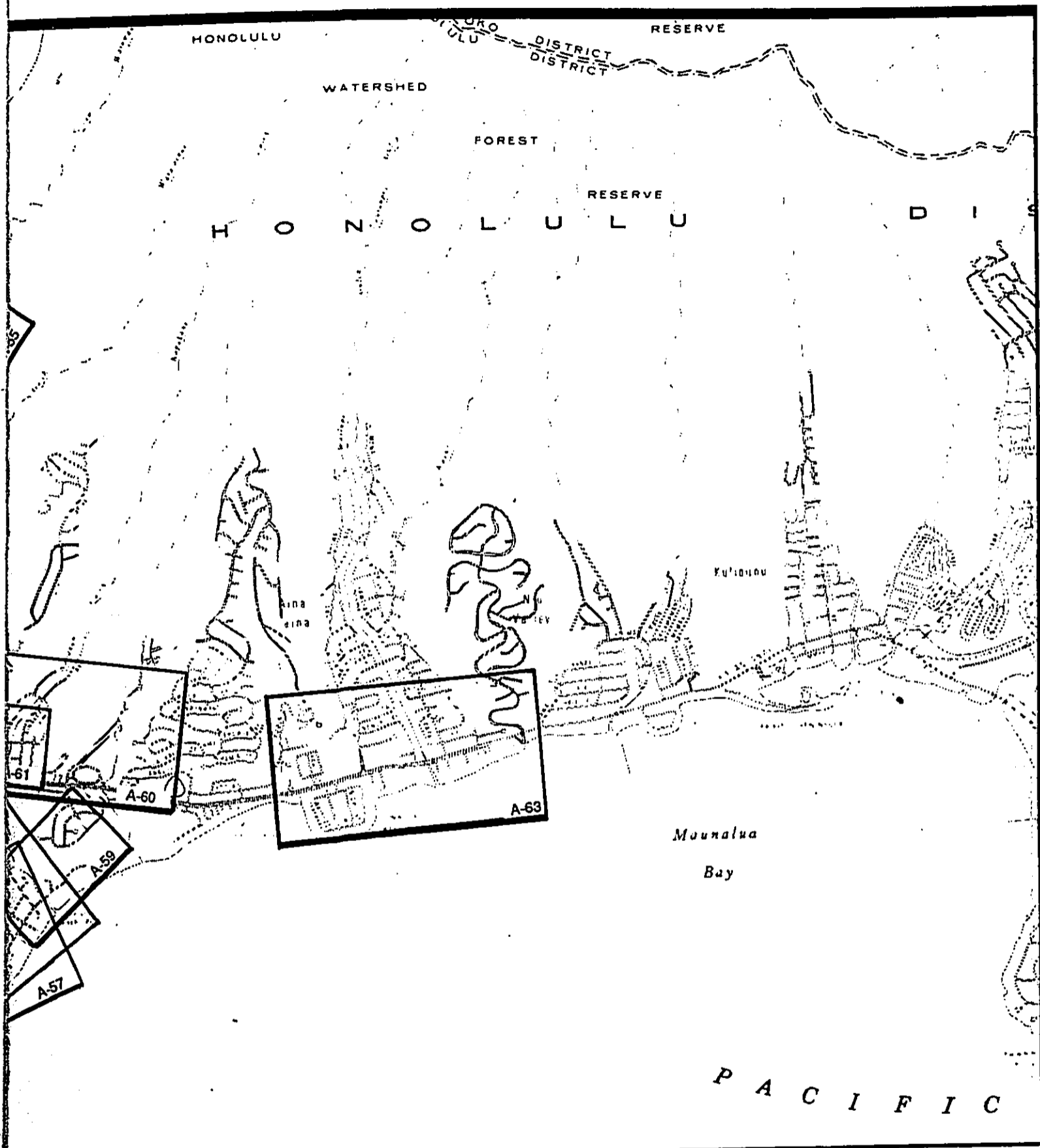
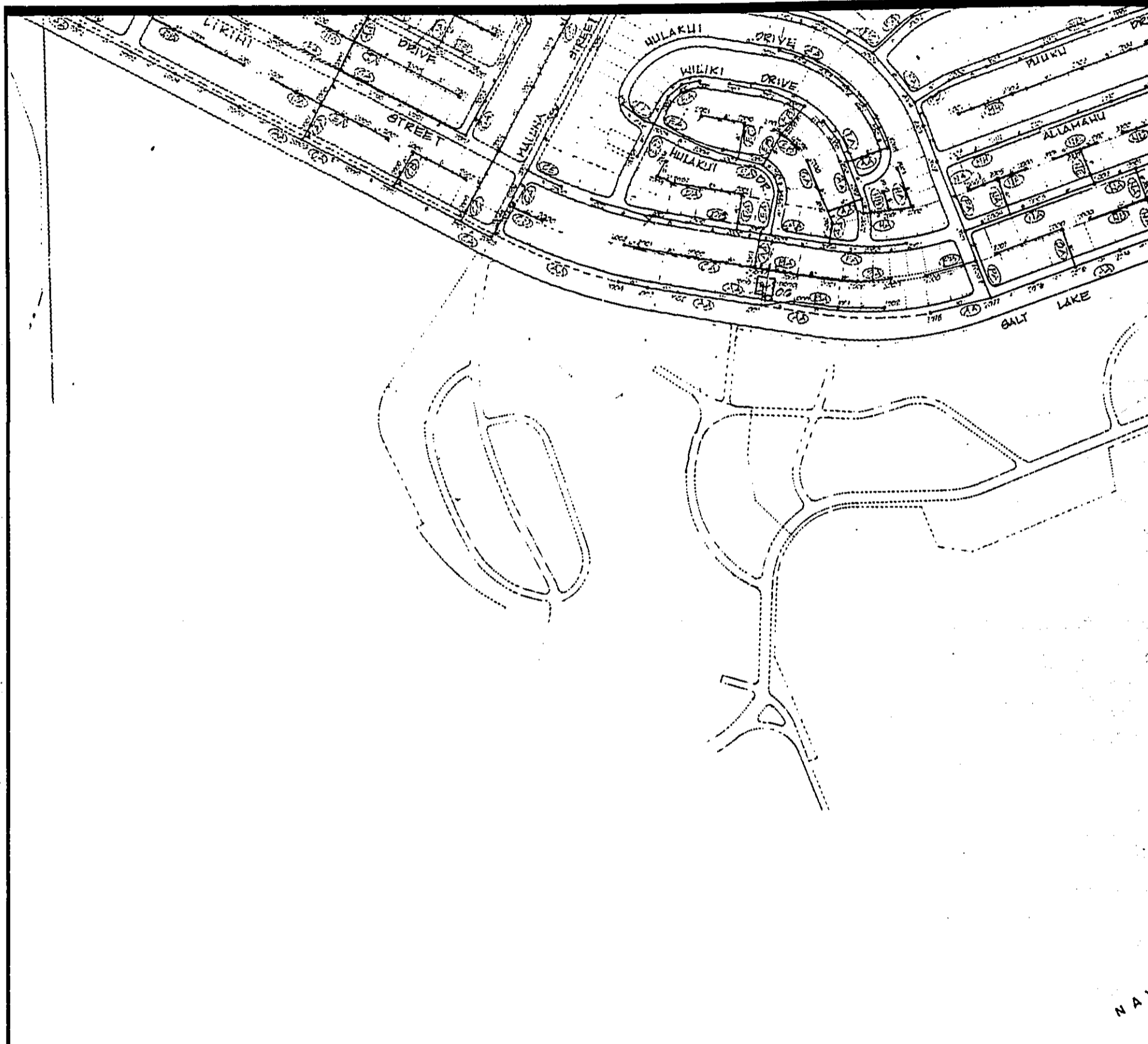
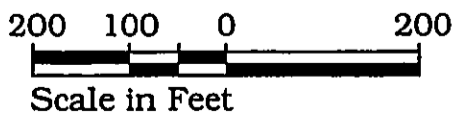


Figure A-3
 Relief Sewers
 Key Map - Area B



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
BELT COLLINS HAWAII • DECEMBER 1993



N A

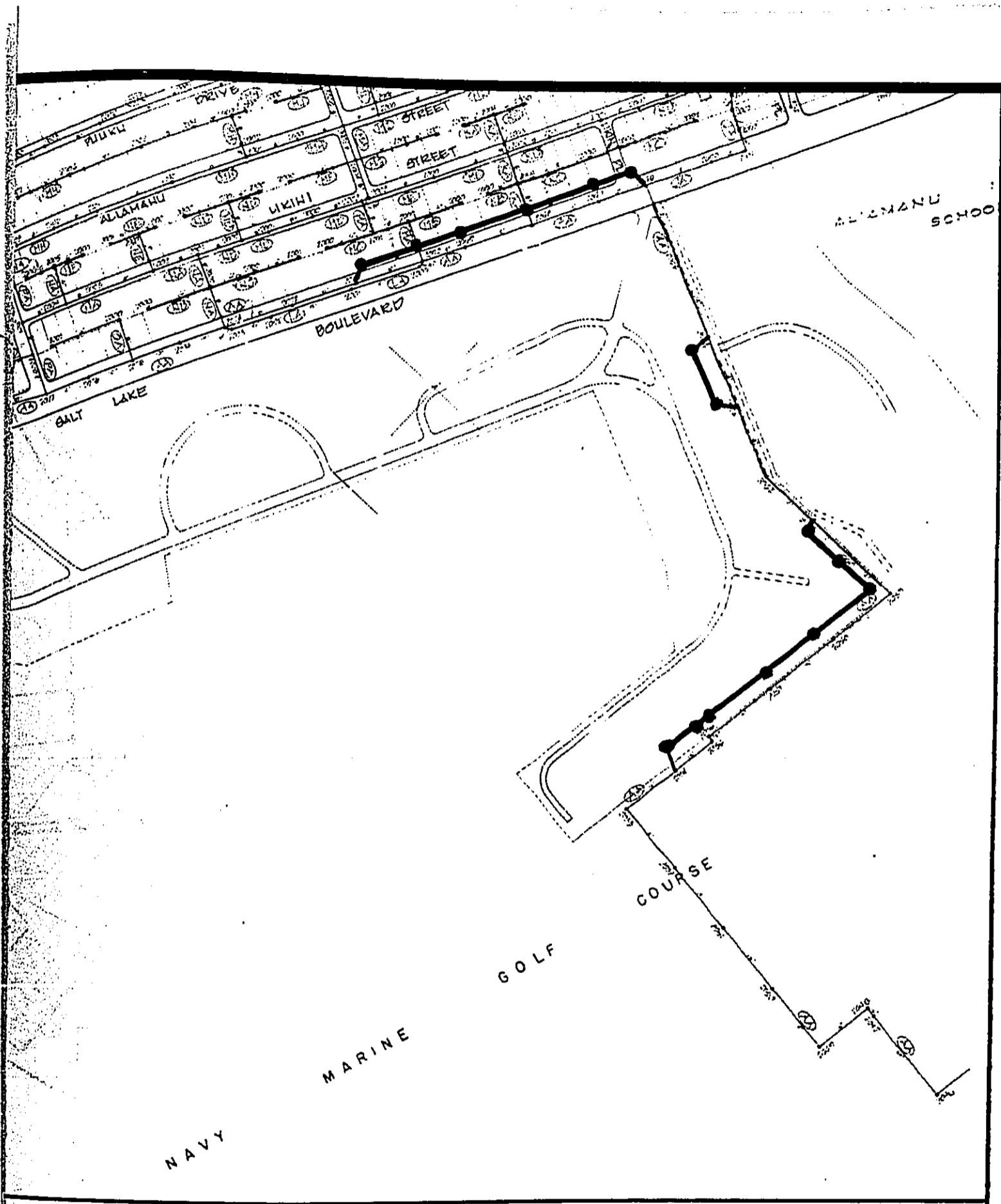
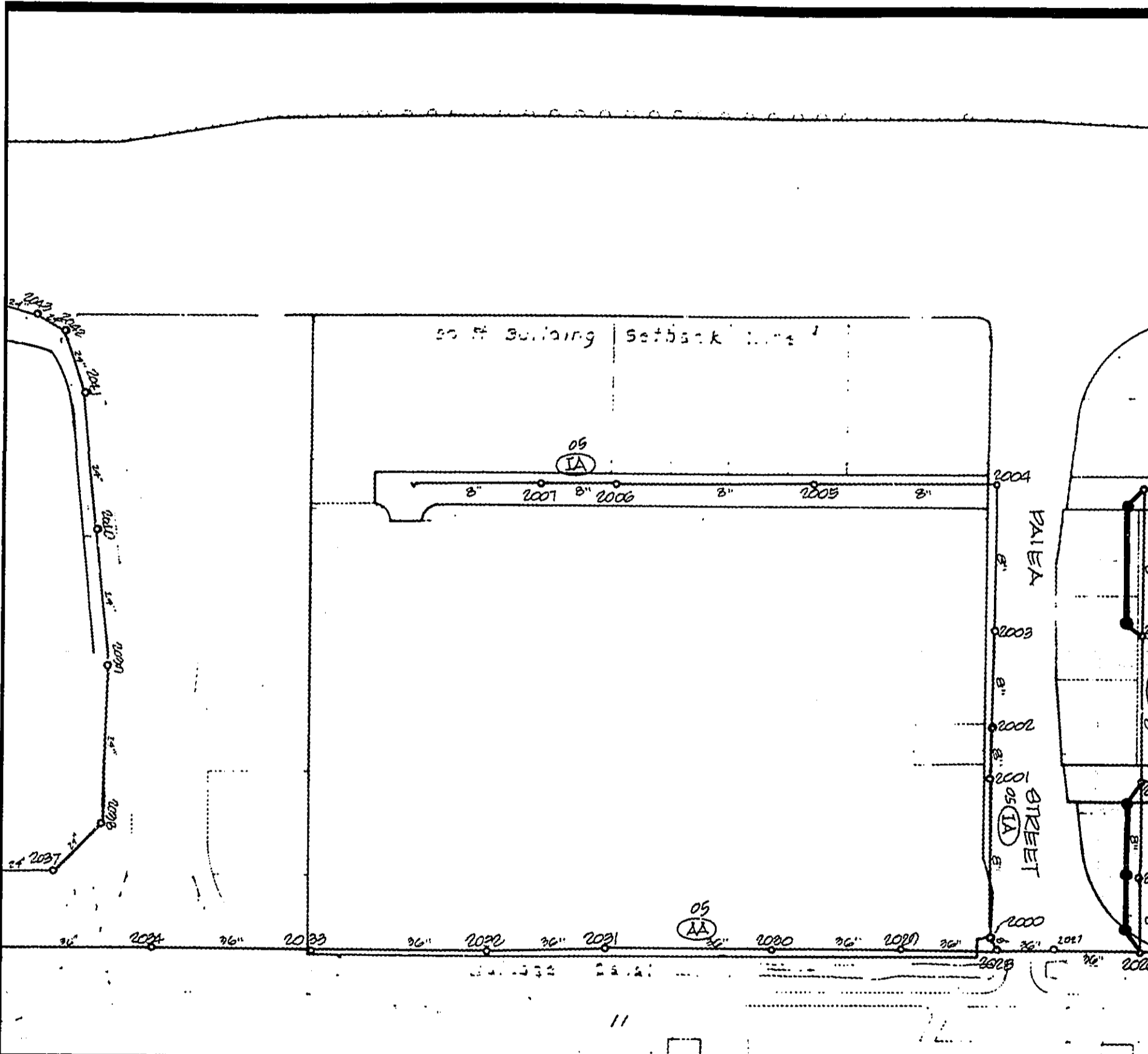
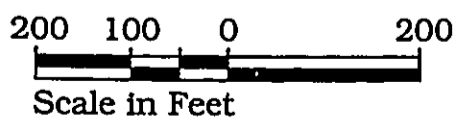


Figure A-4
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



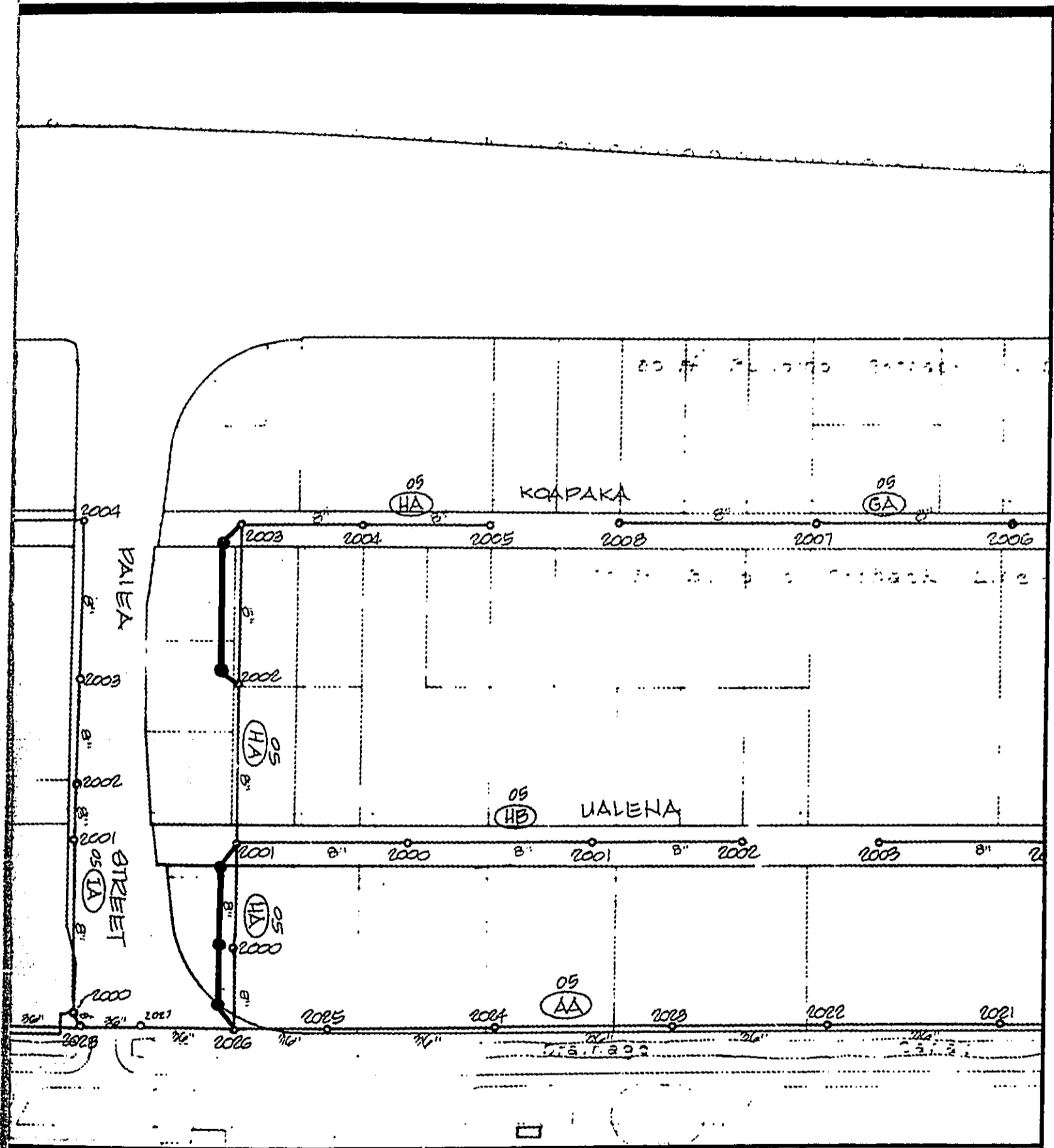
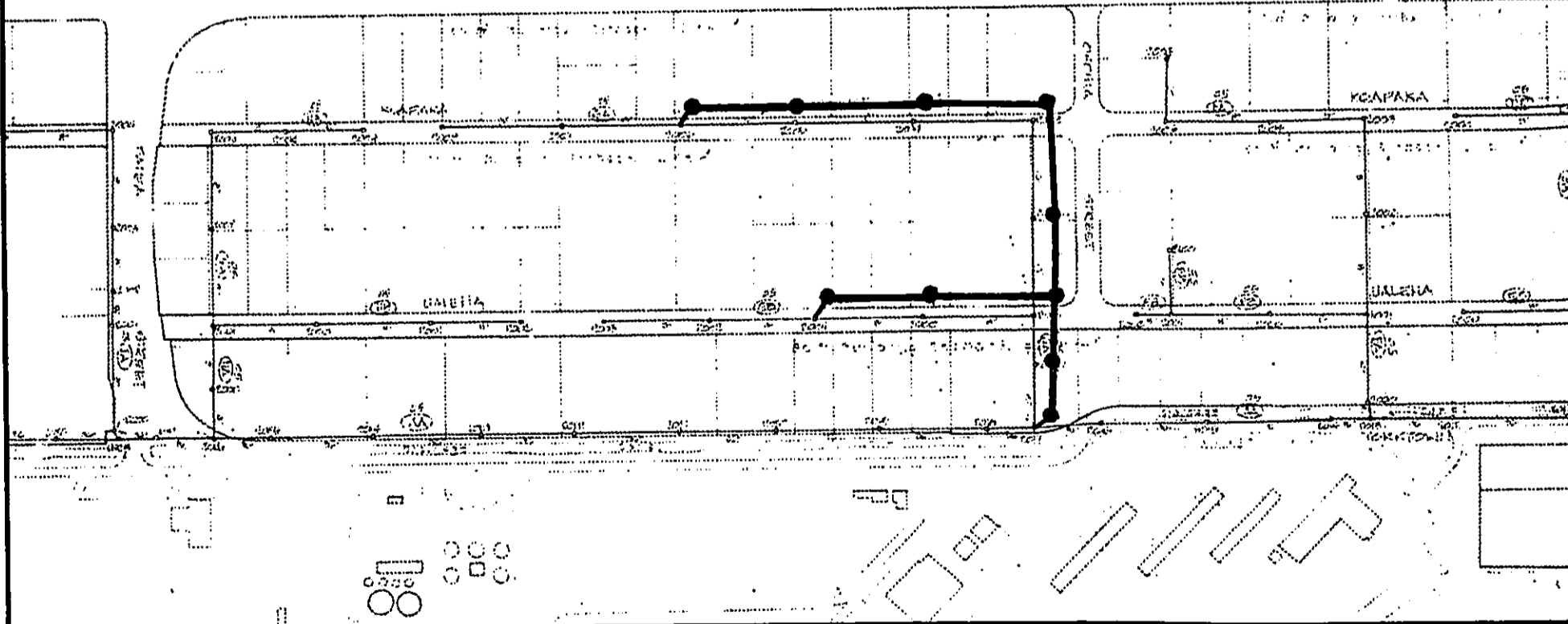


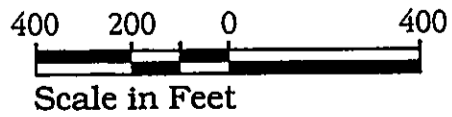
Figure A-5
Relief Sewers

KAMEHAMEHA

HIG



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
BELT COLLINS HAWAII • DECEMBER 1993



North

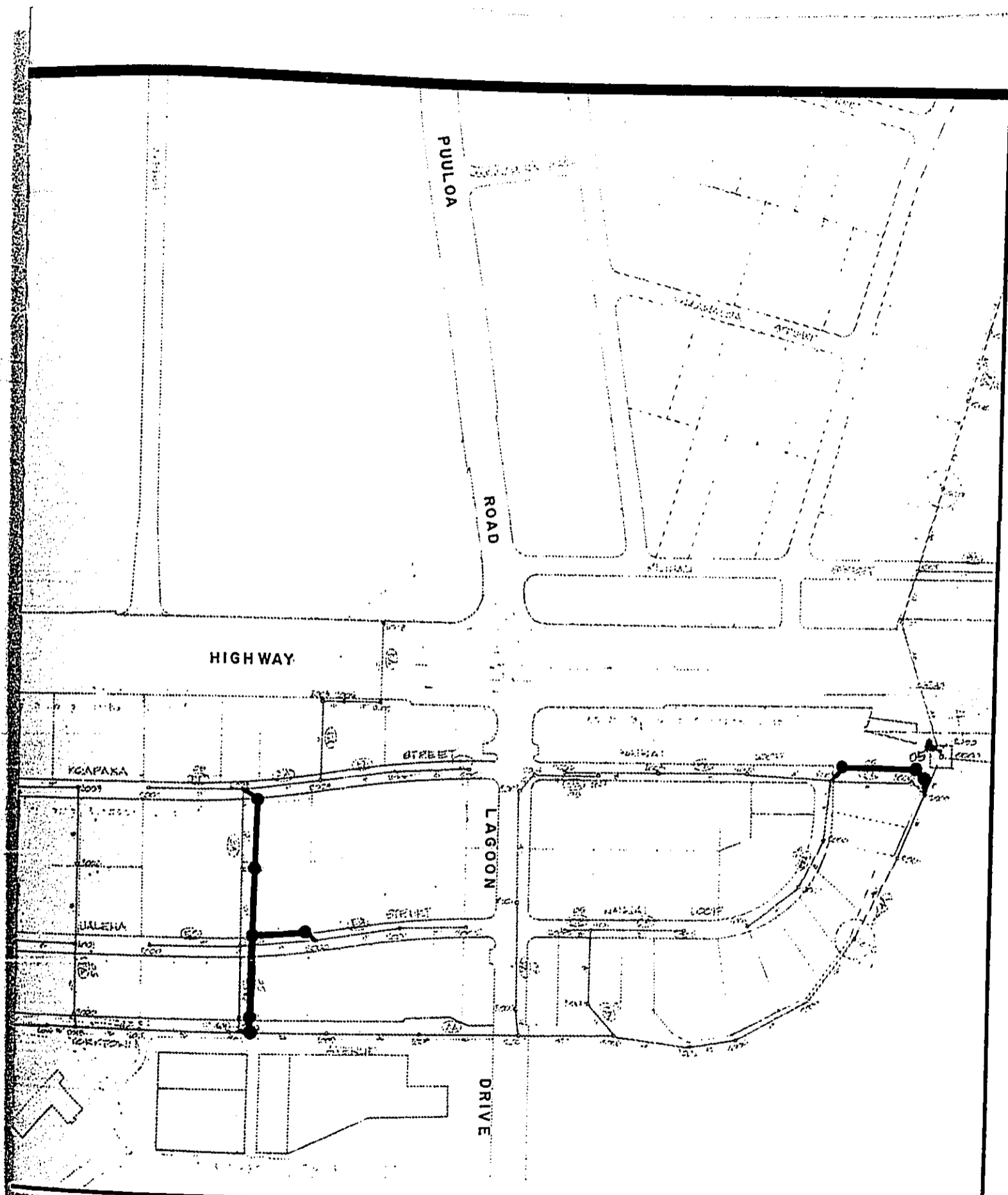
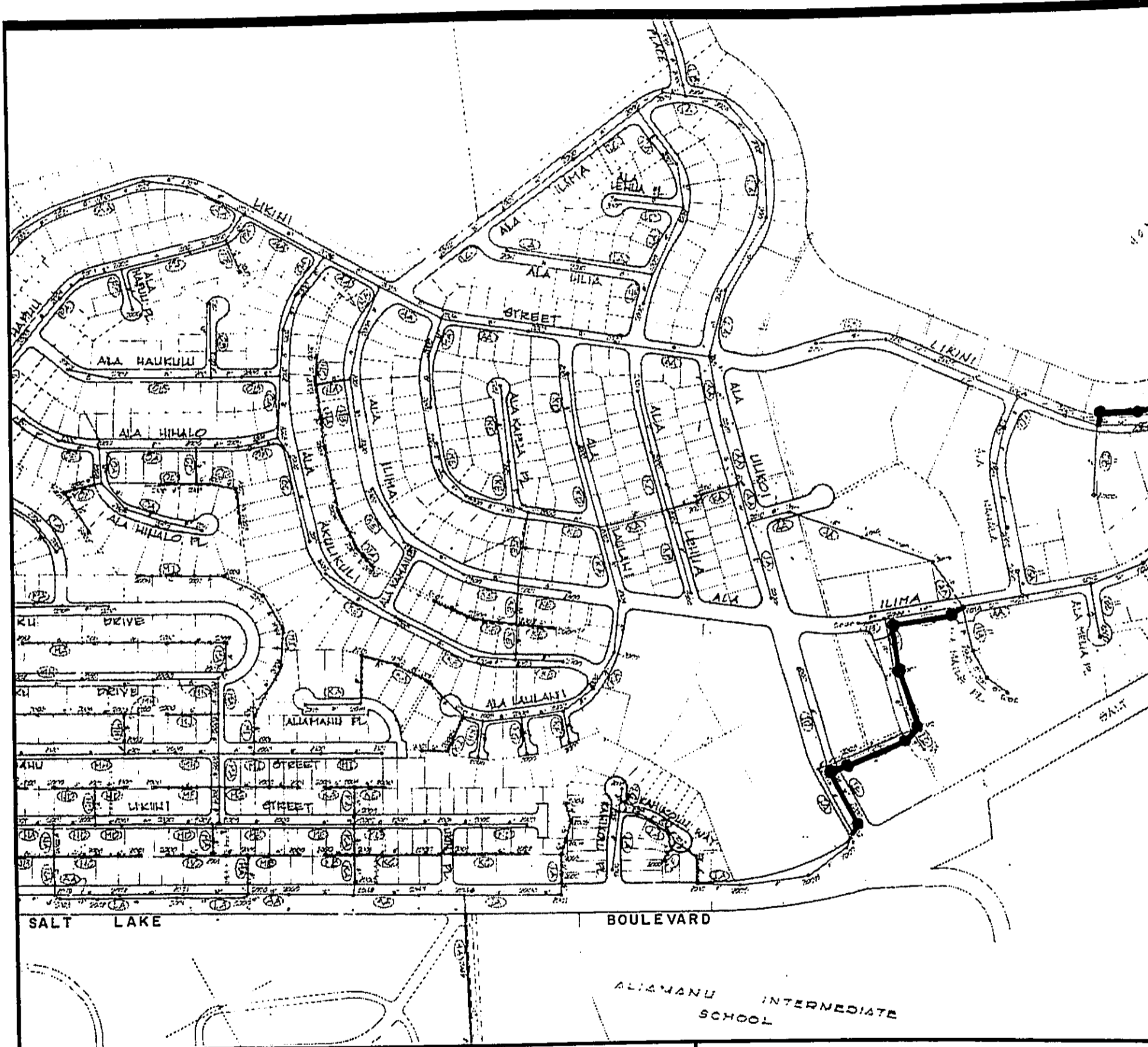
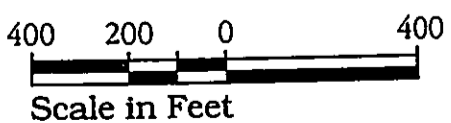


Figure A-6
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



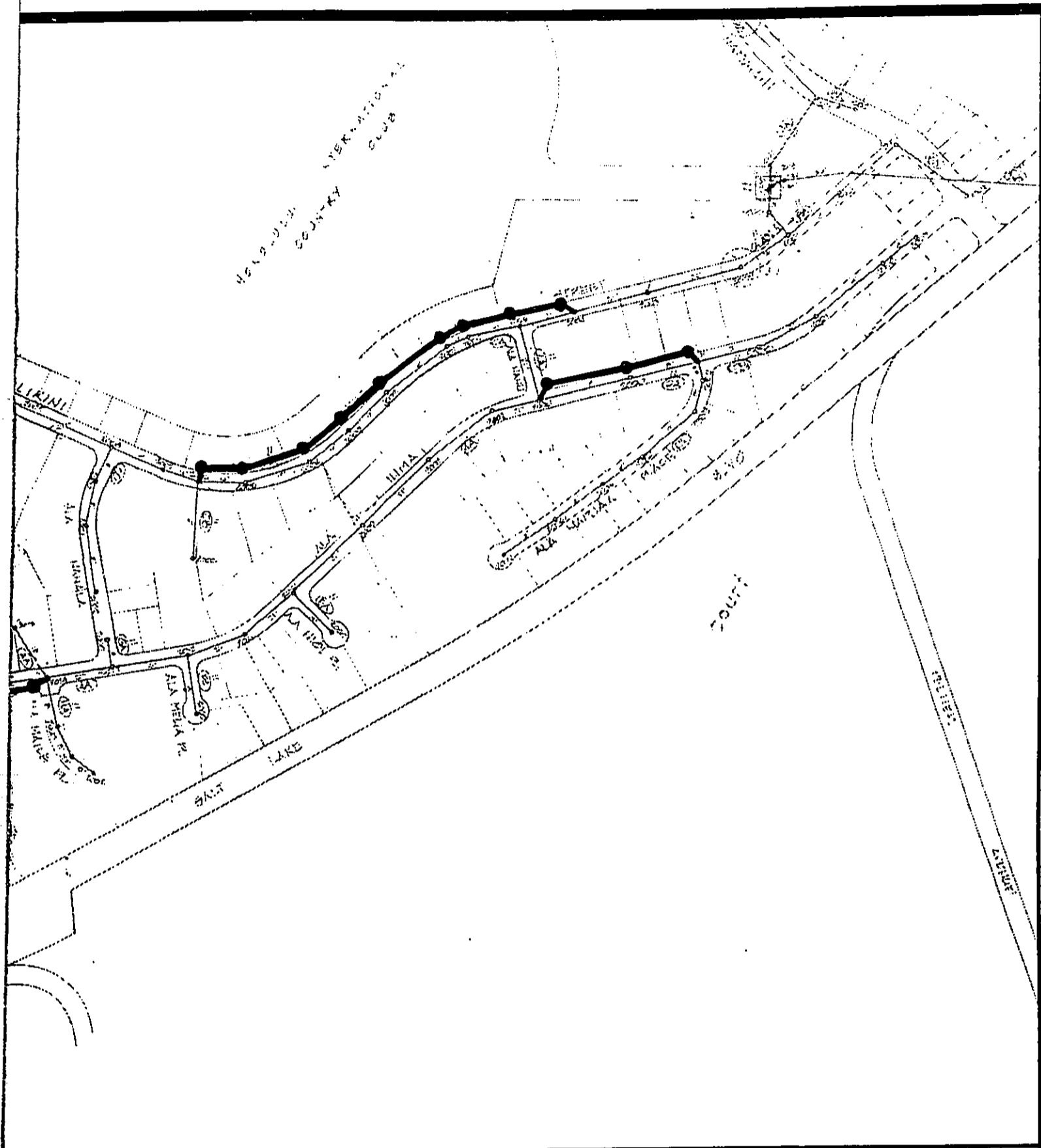
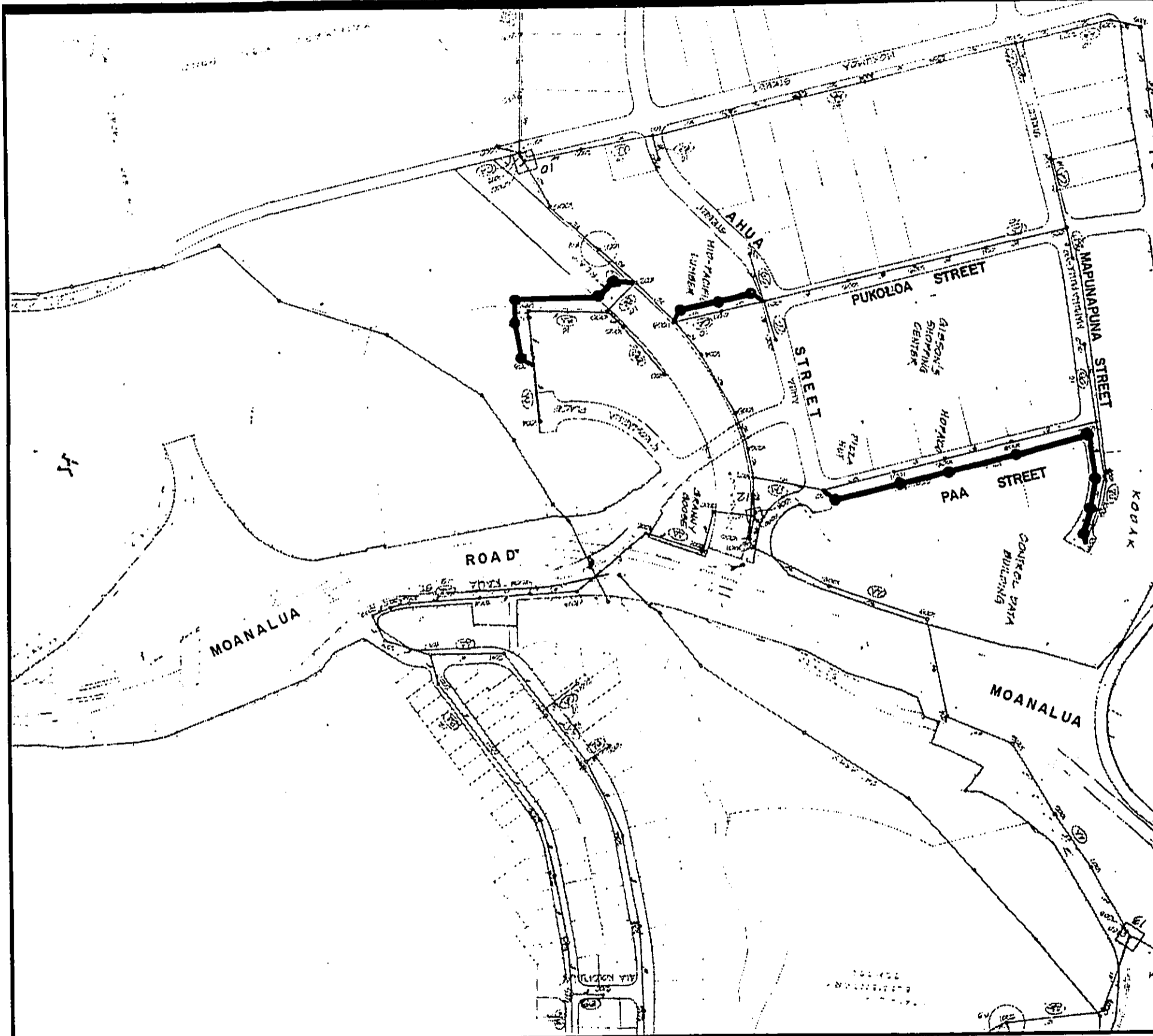
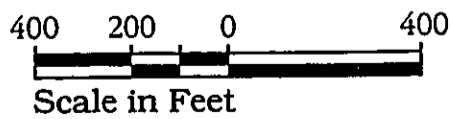


Figure A-7
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



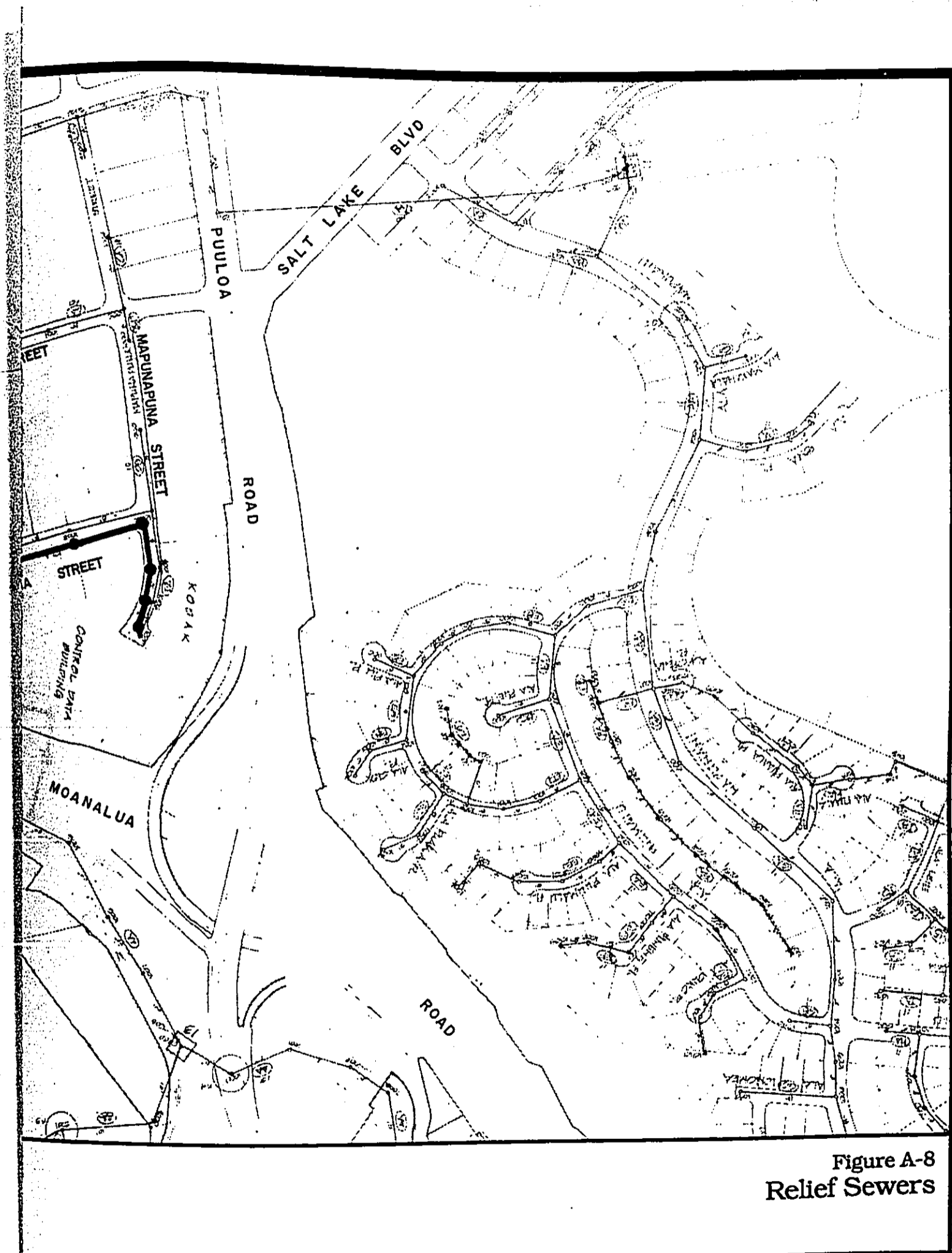
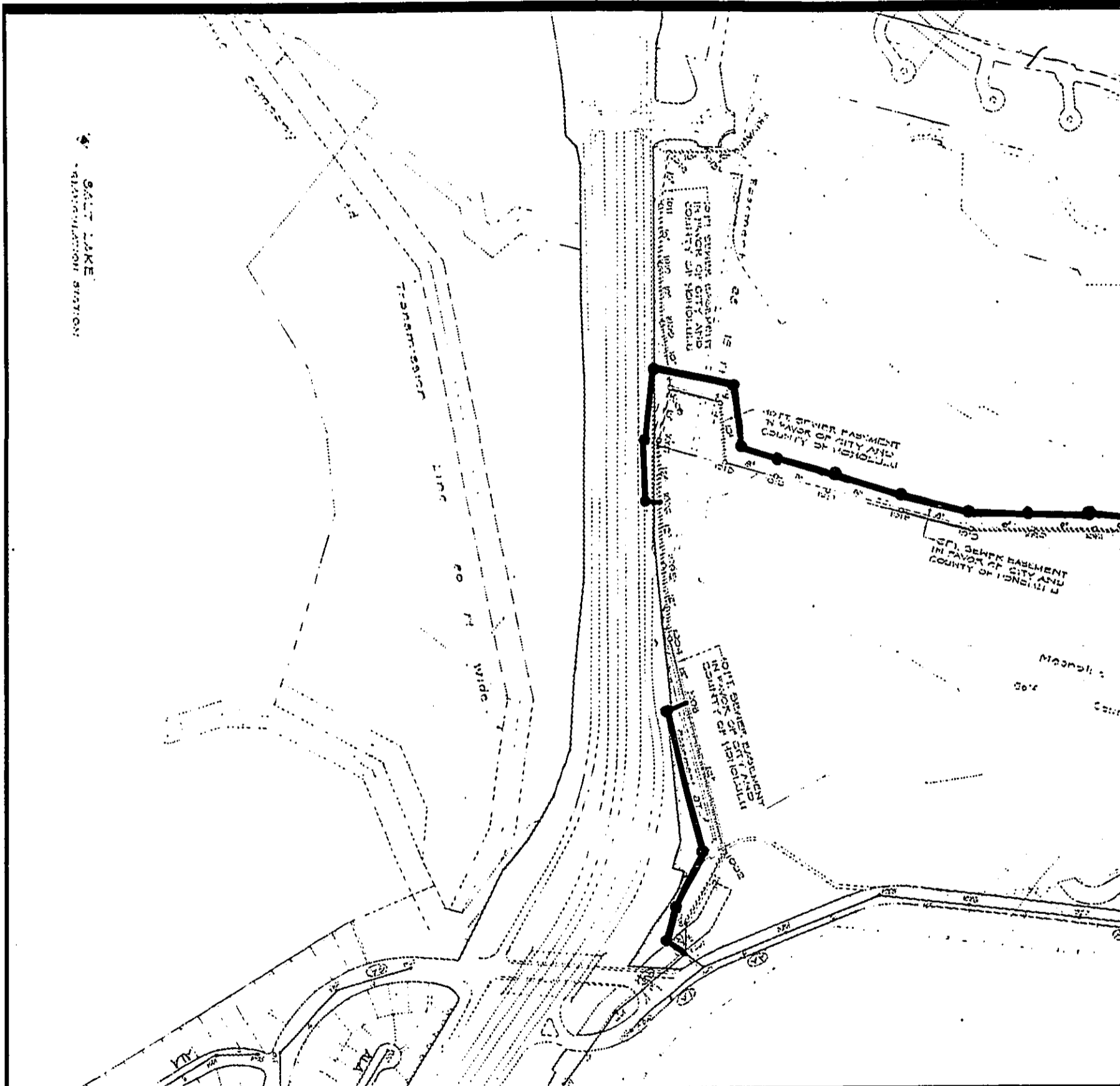
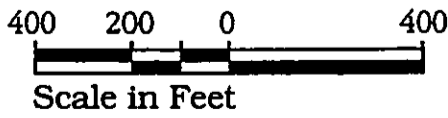


Figure A-8
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



North

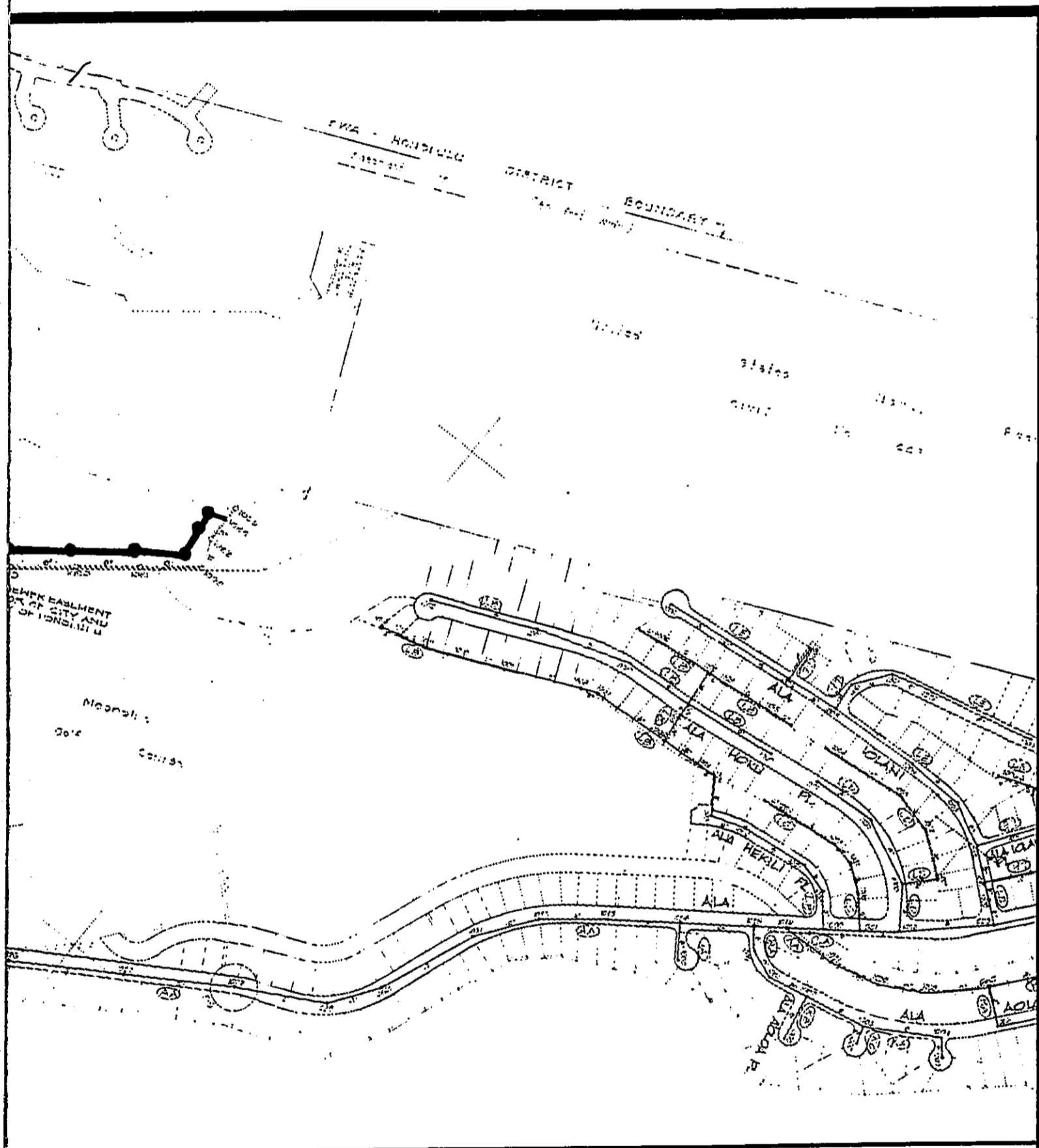
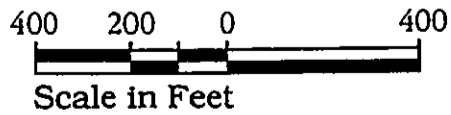


Figure A-9
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



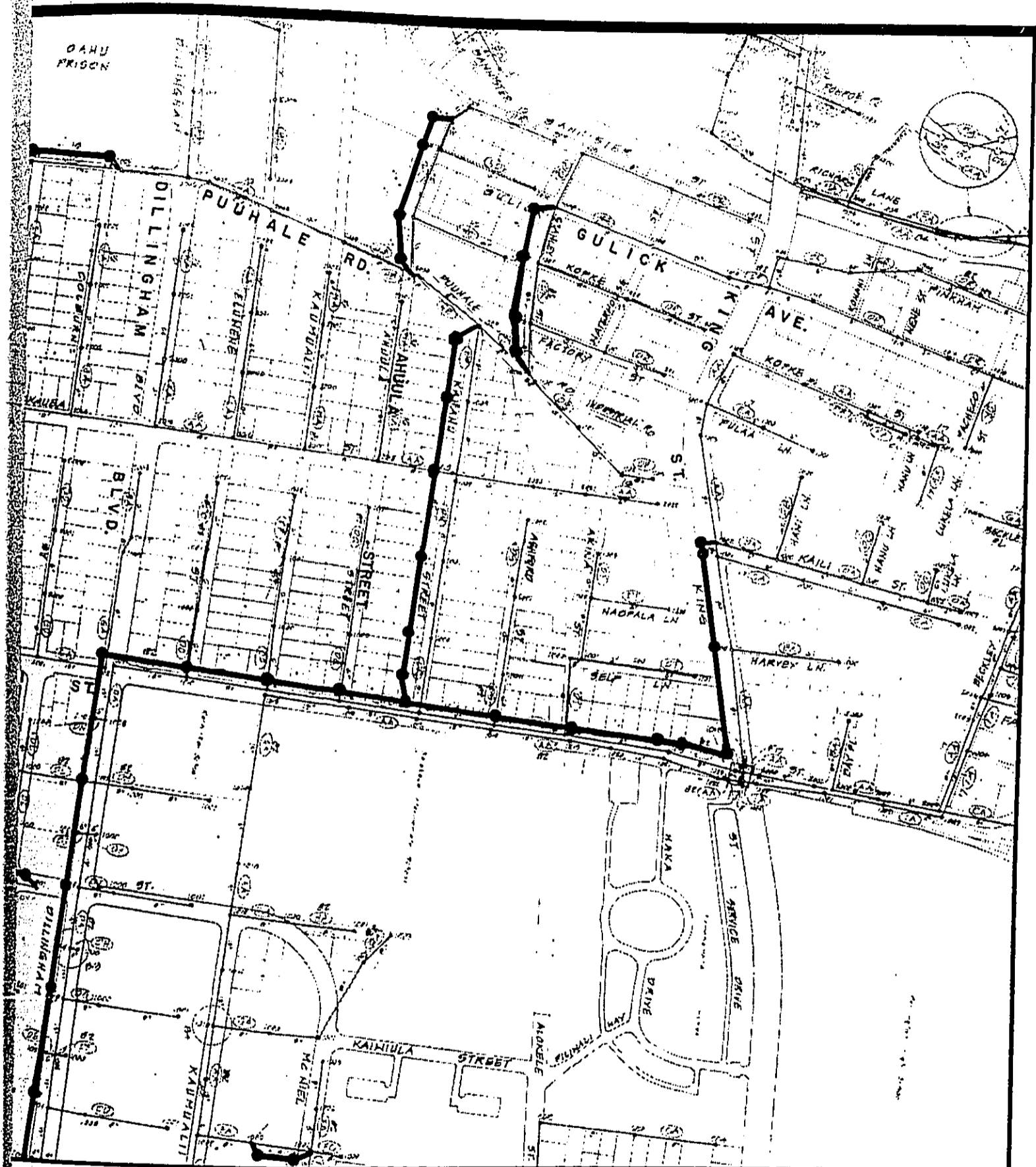
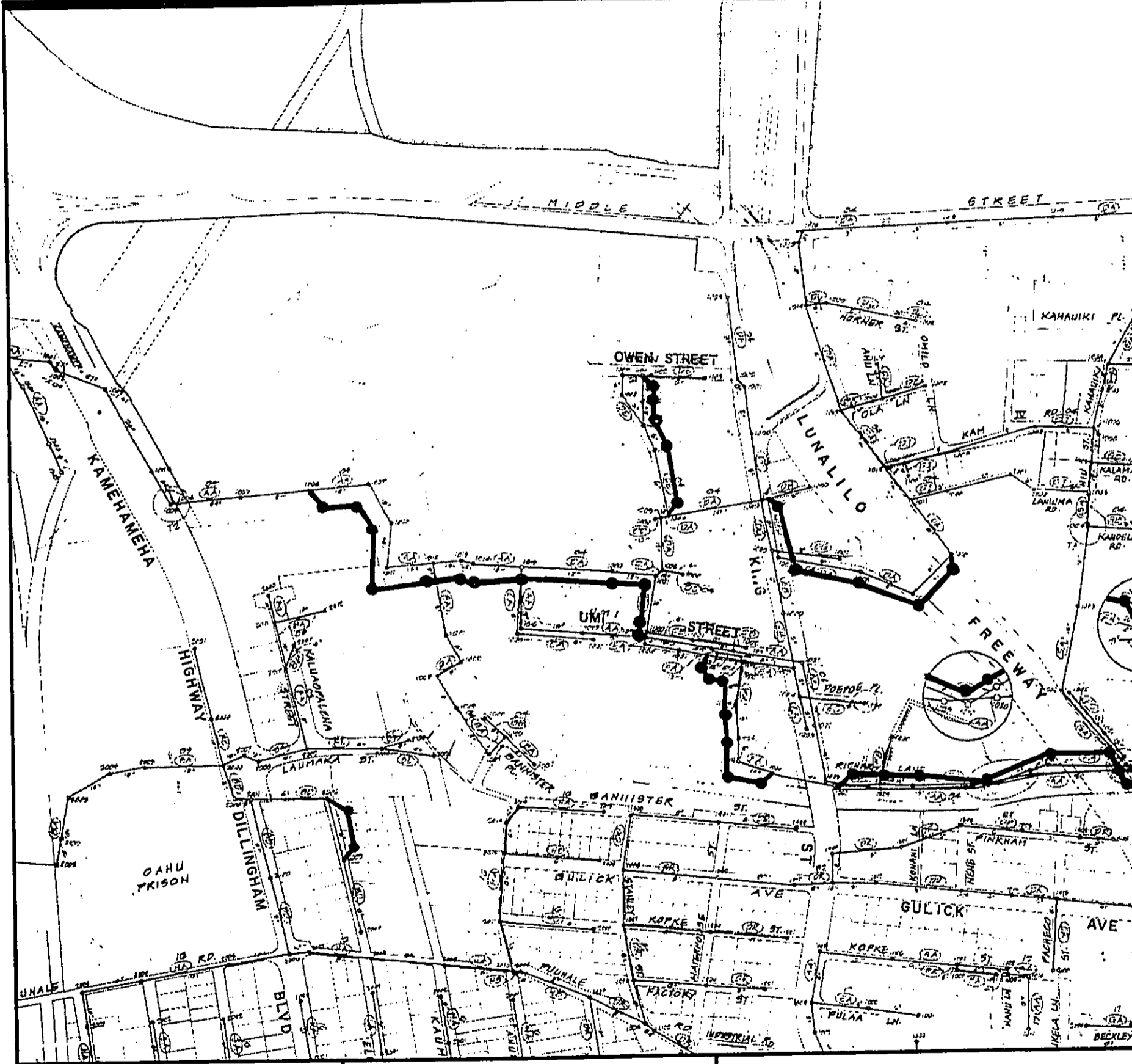
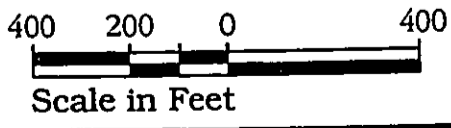


Figure A-12
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



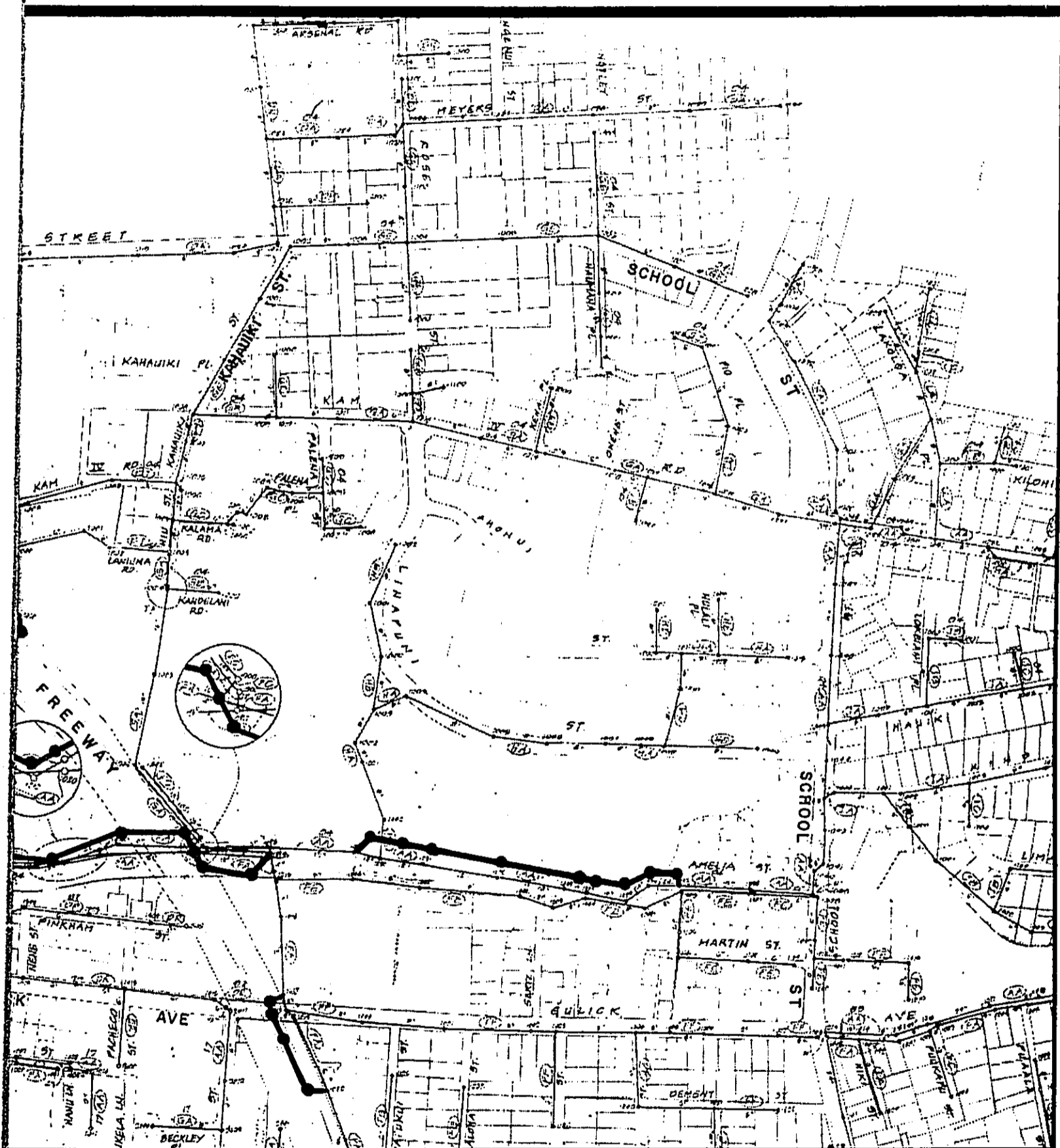
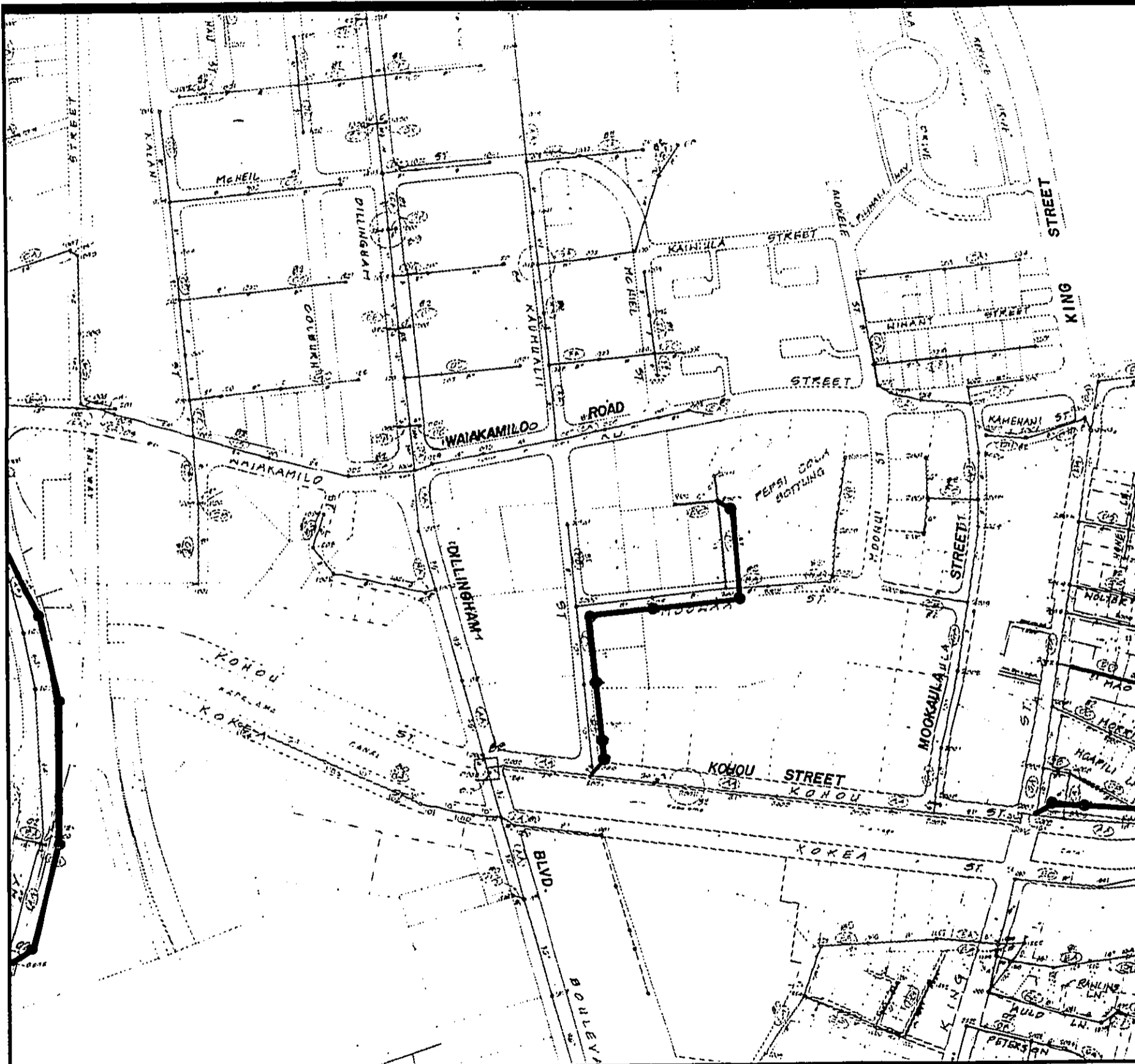
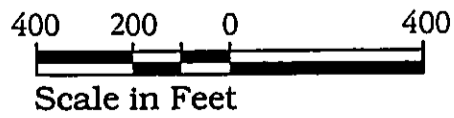


Figure A-13
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



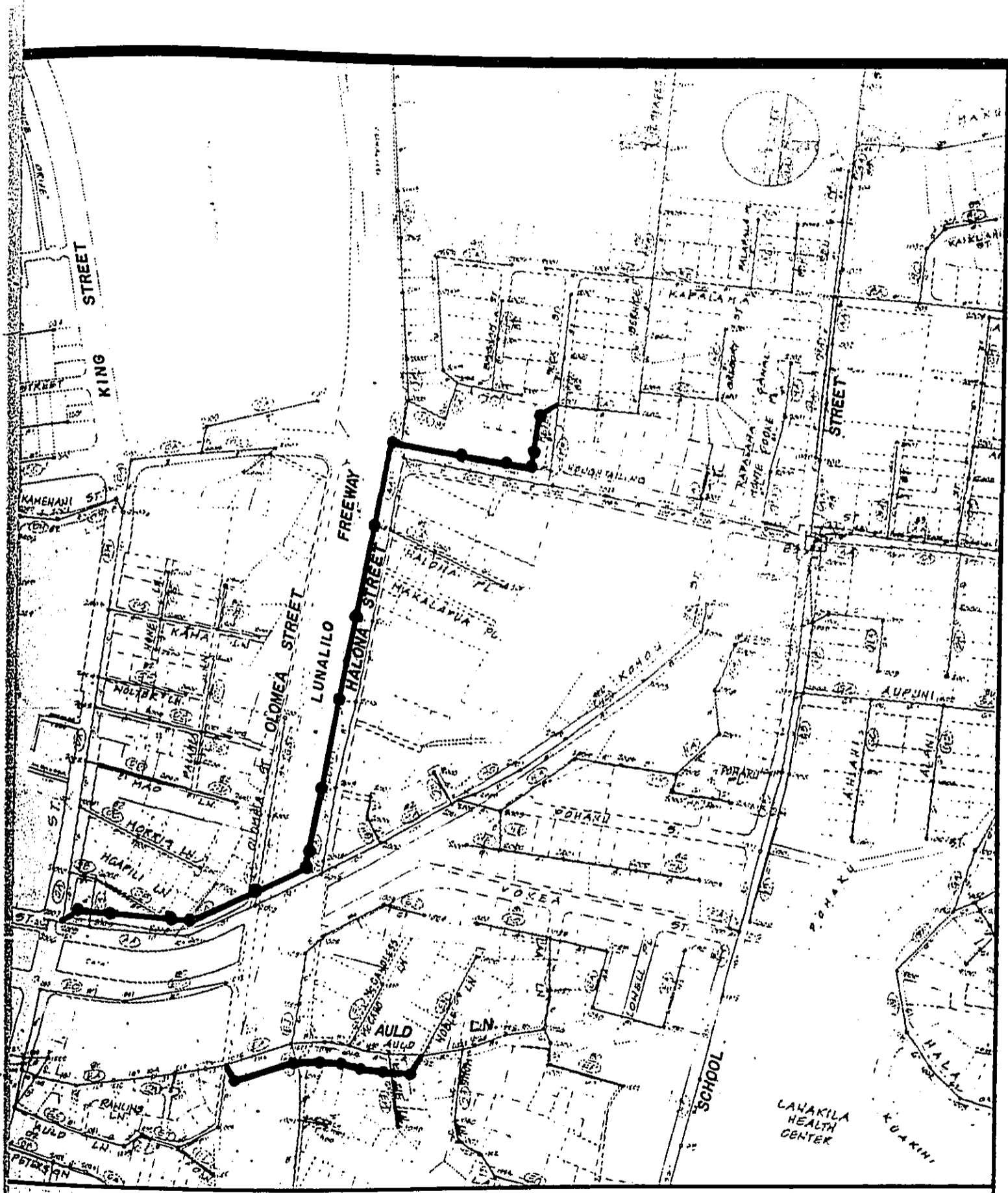
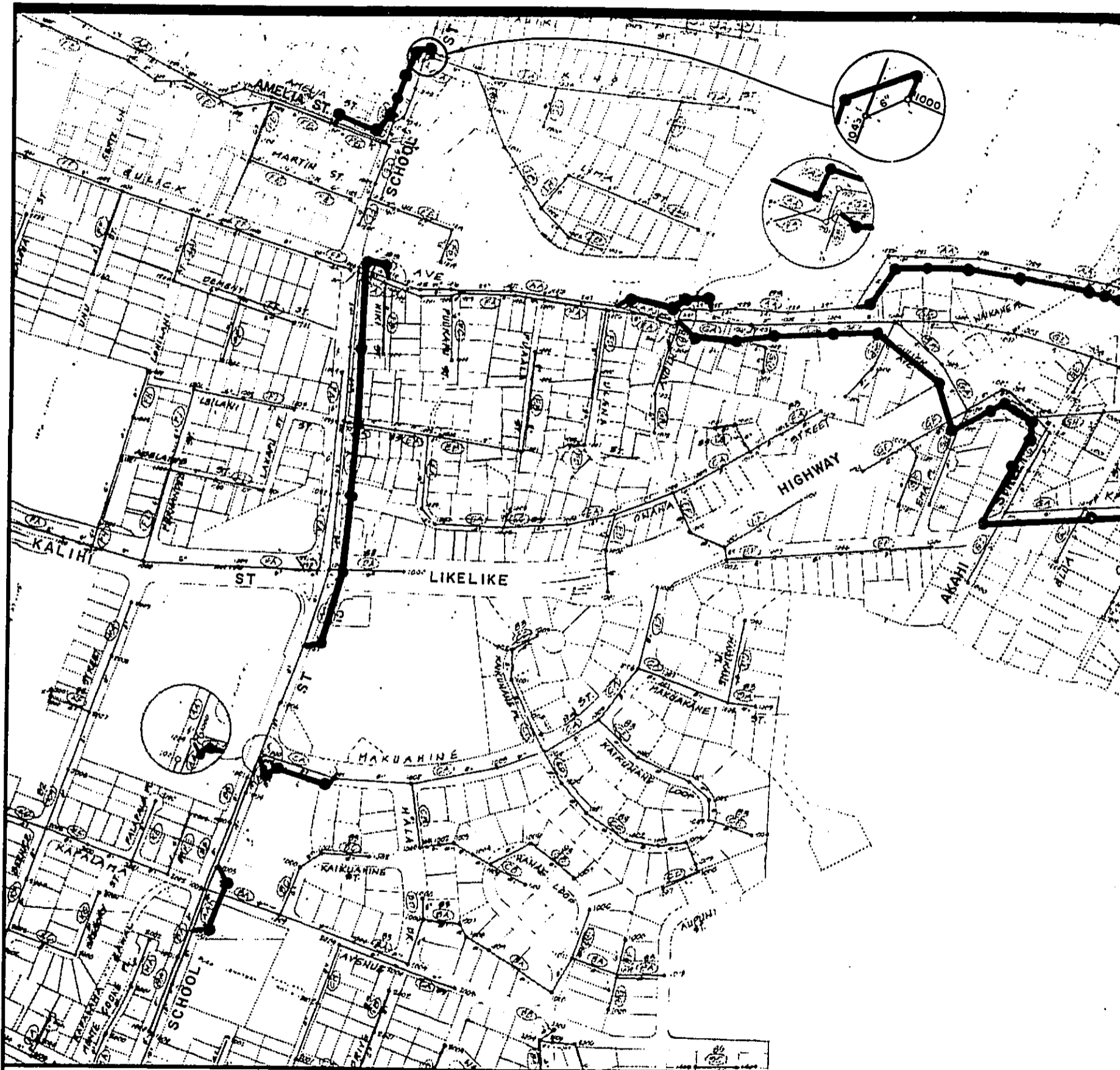
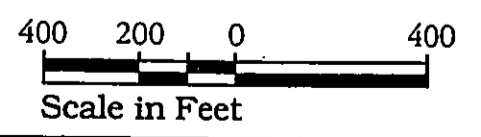


Figure A-14
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



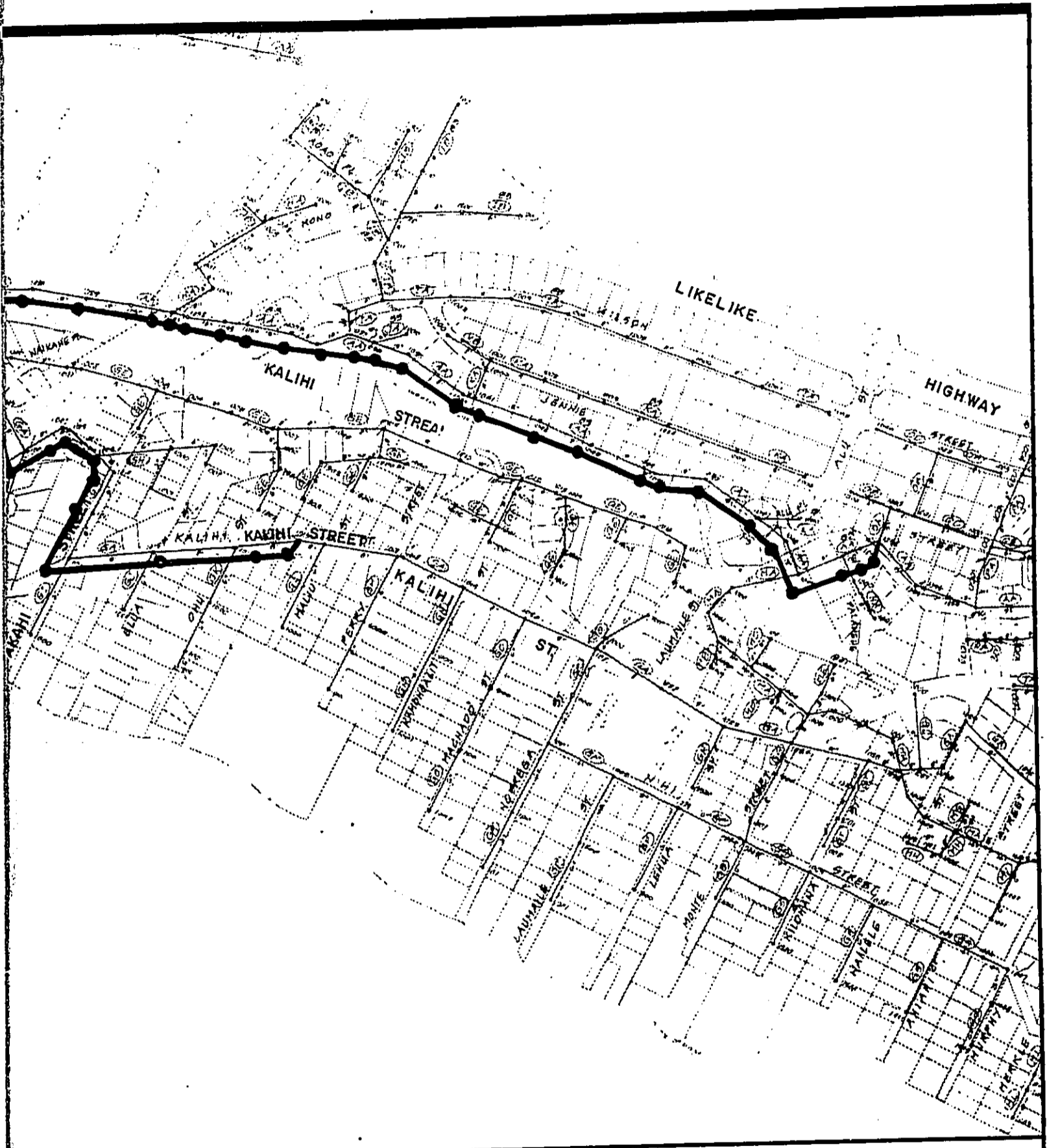
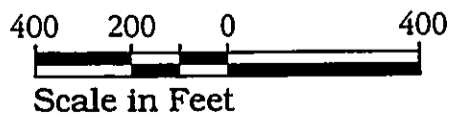


Figure A-15
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



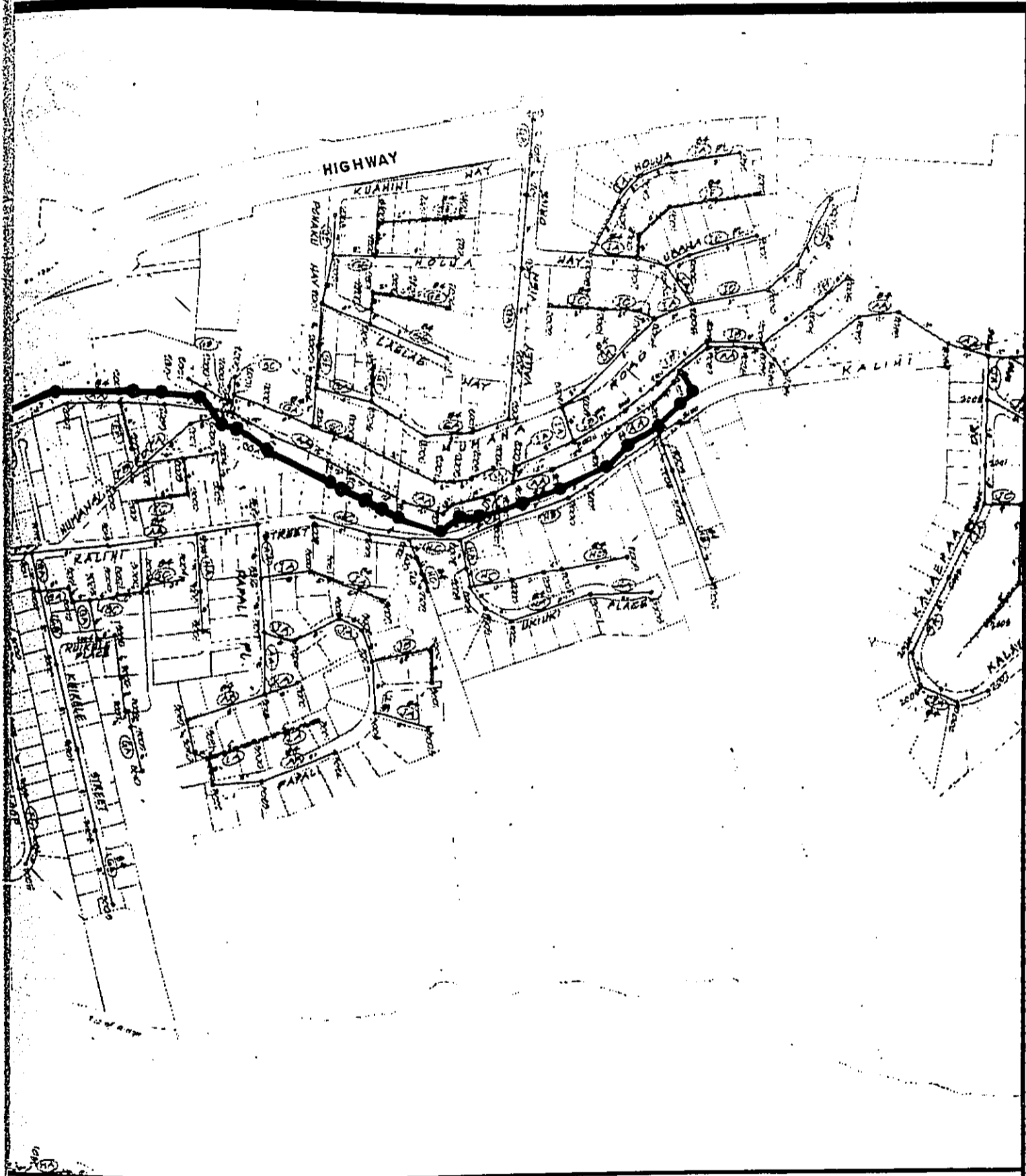
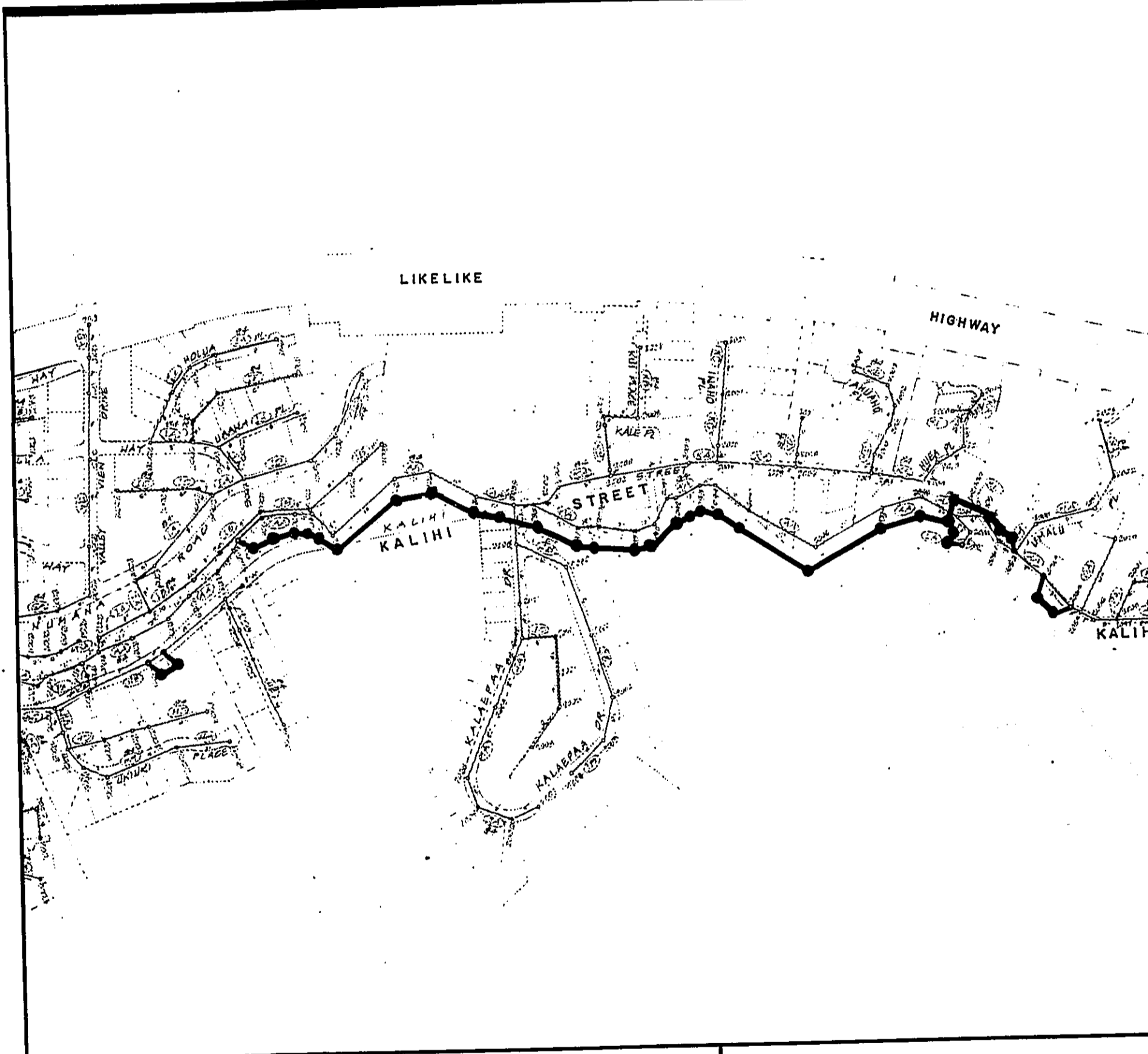
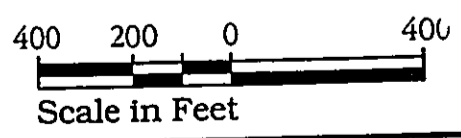


Figure A-16
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
BELT COLLINS HAWAII • DECEMBER 1993



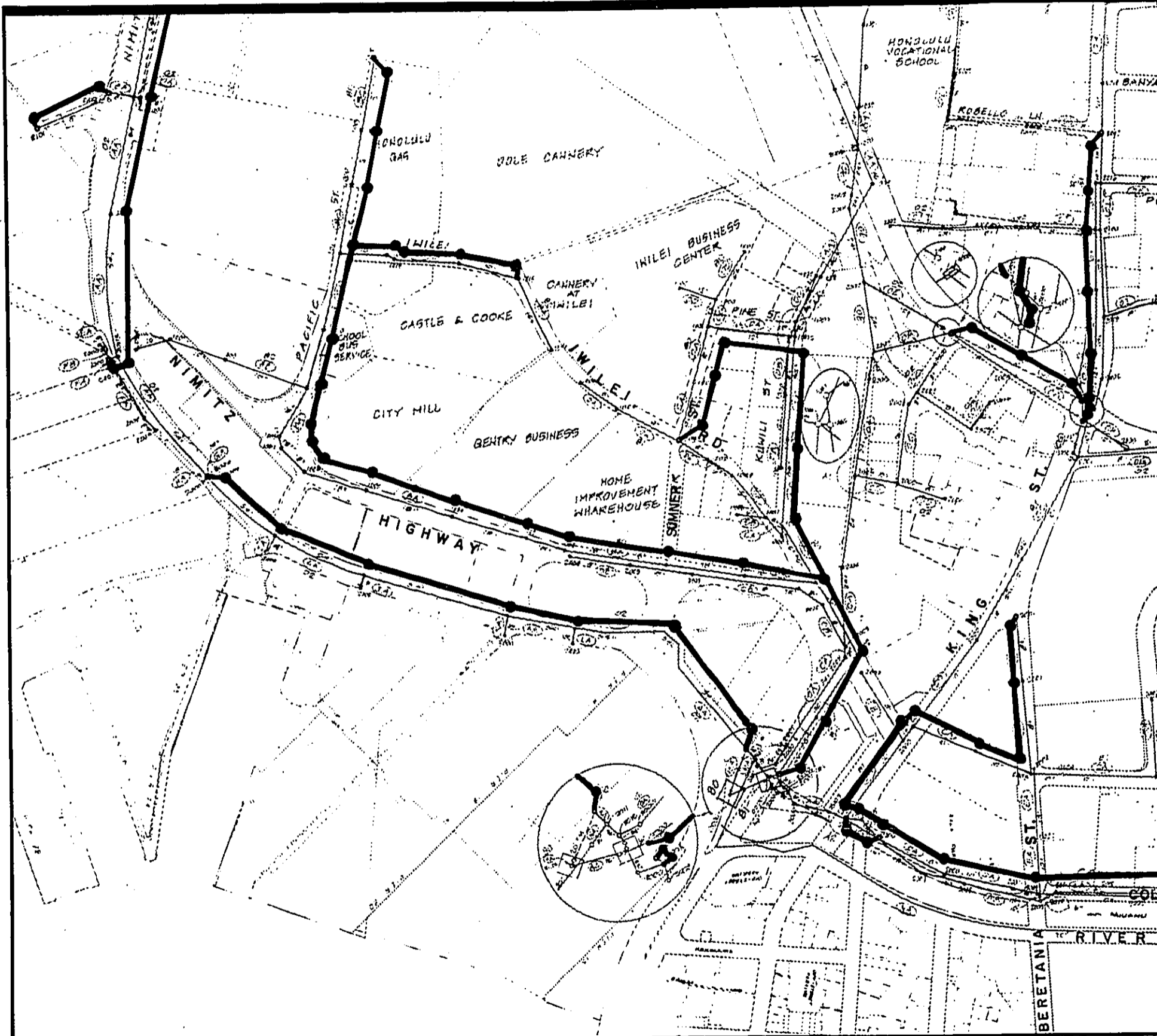
Scale in Feet



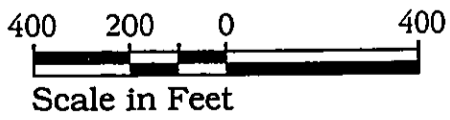
North



Figure A-17
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



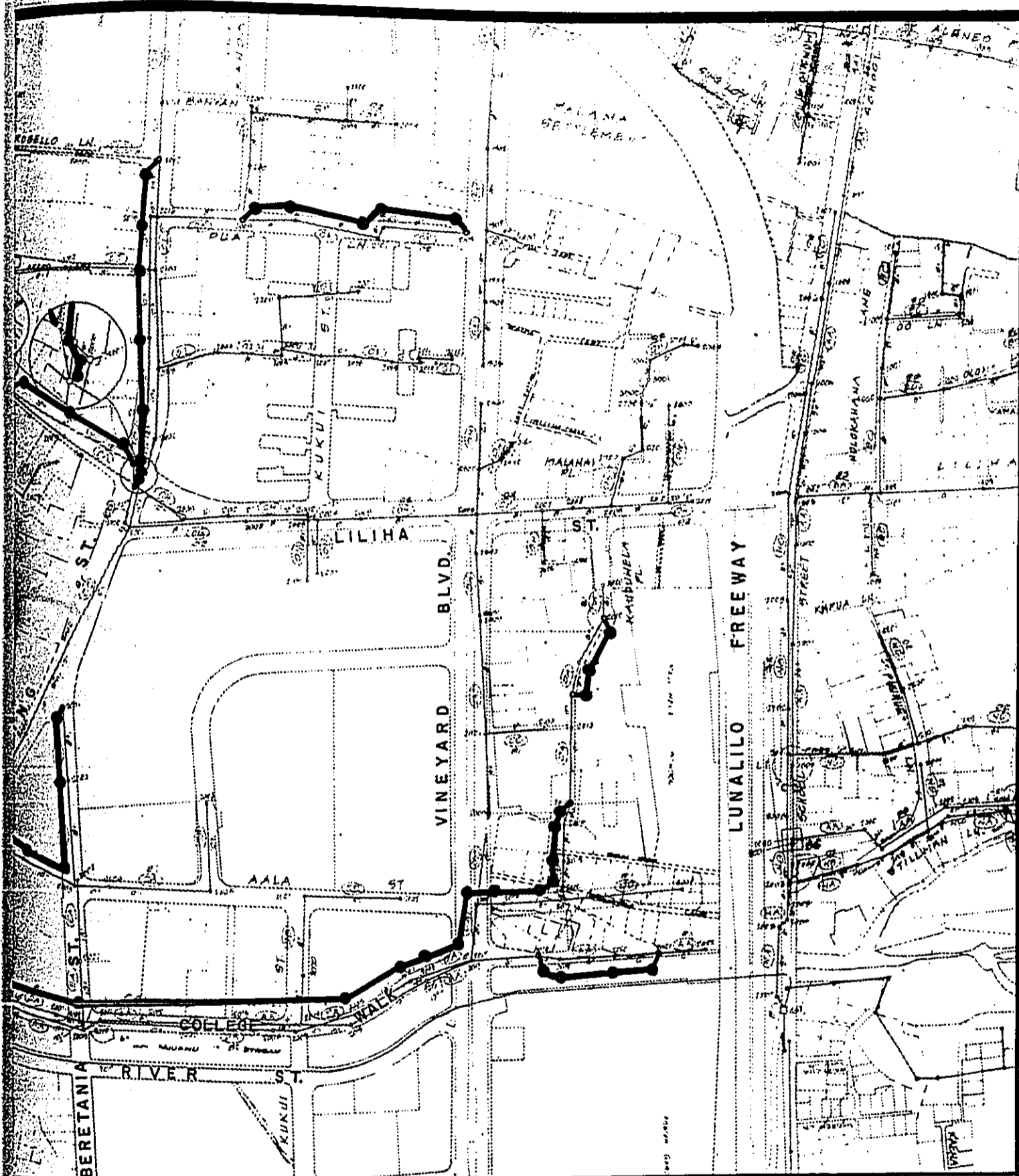
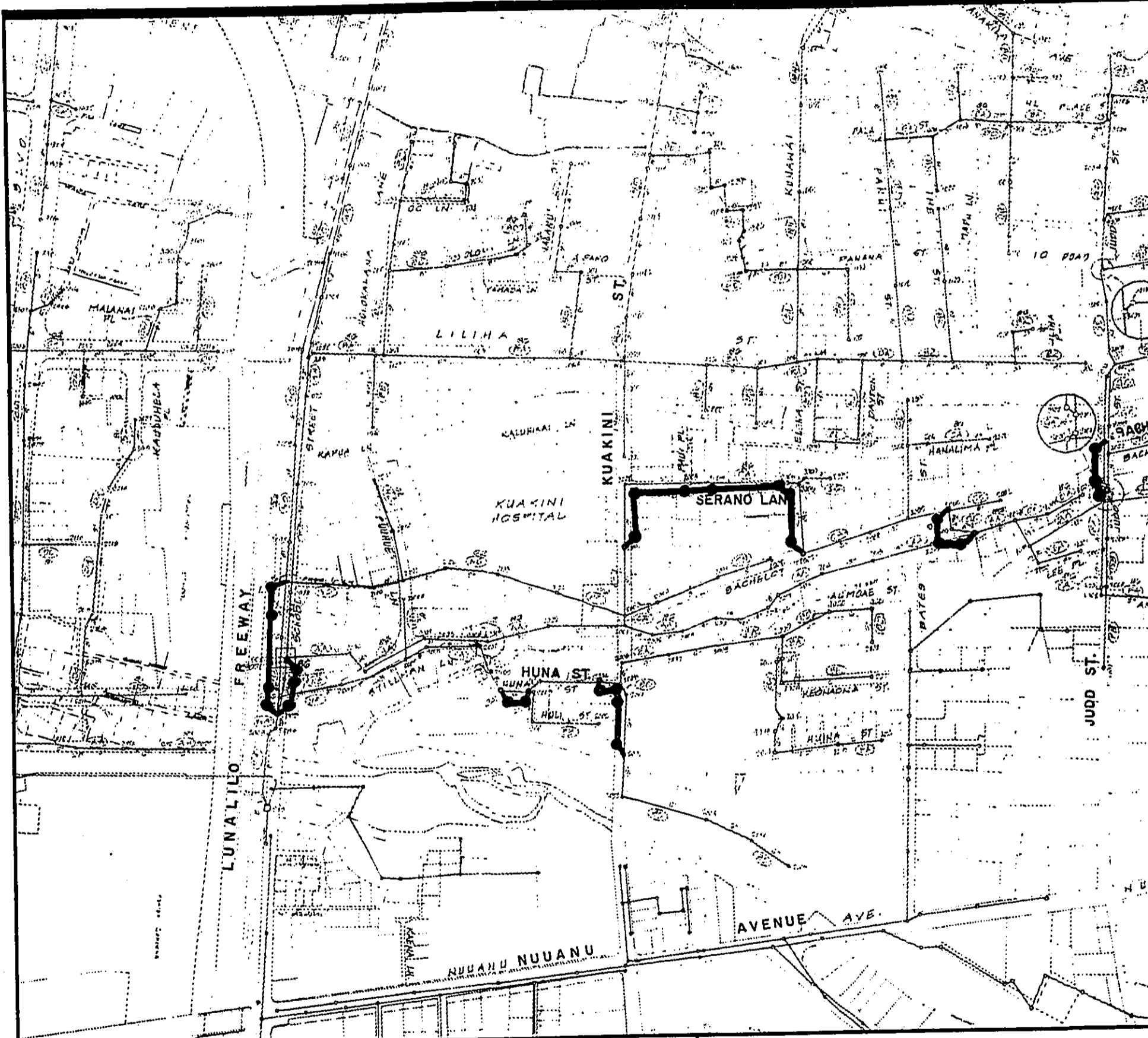
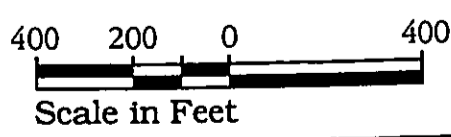


Figure A-18
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



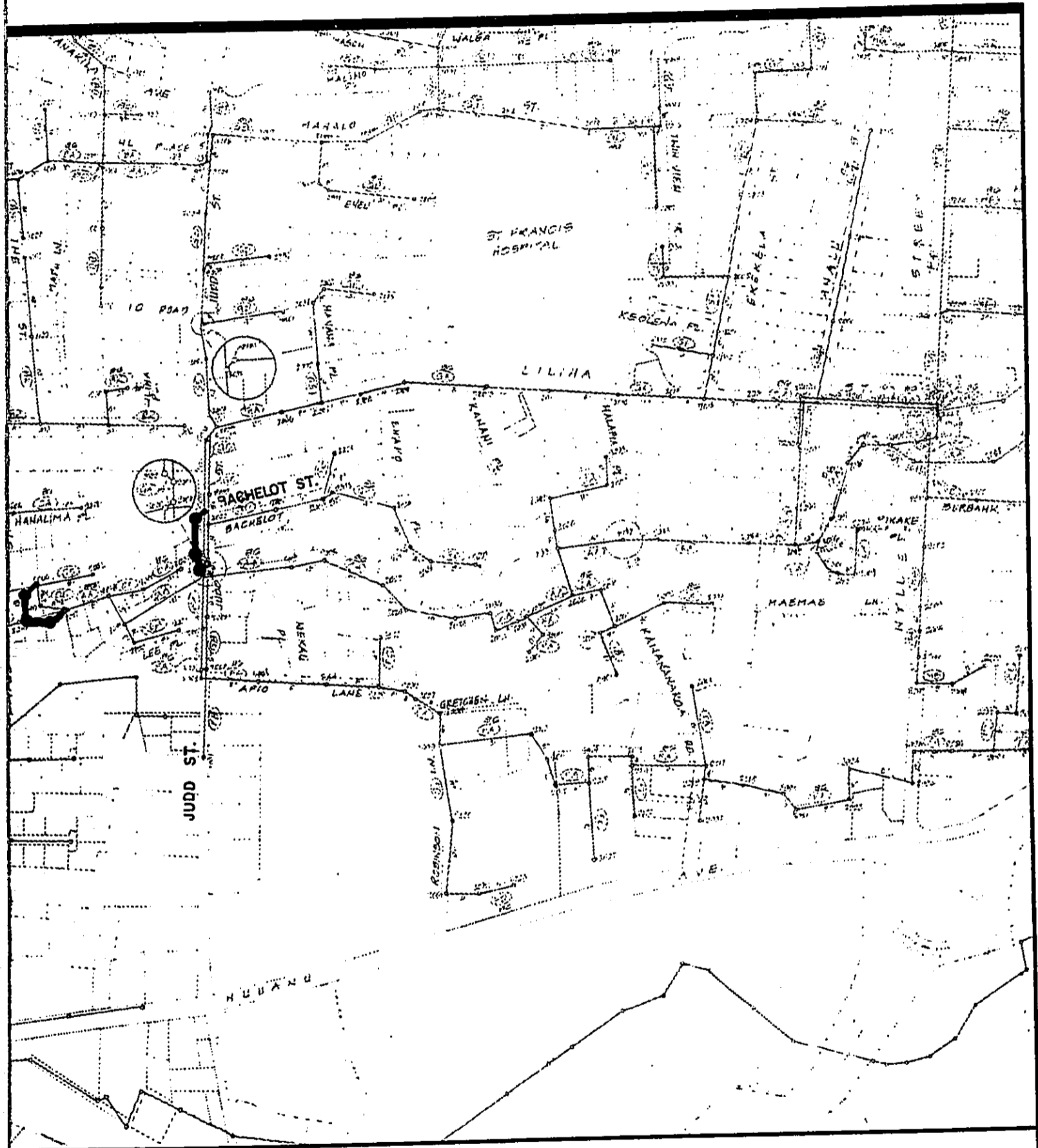
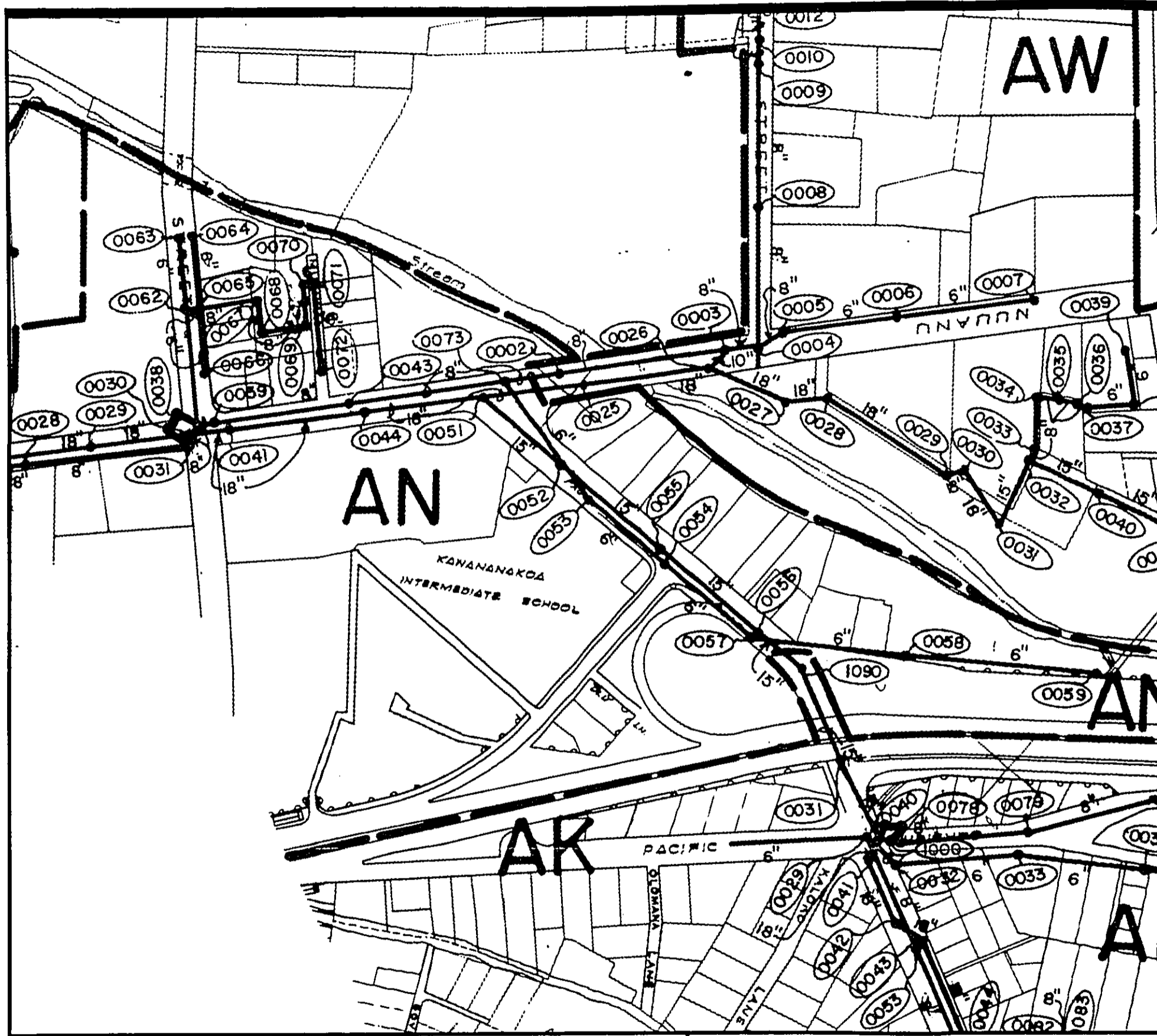
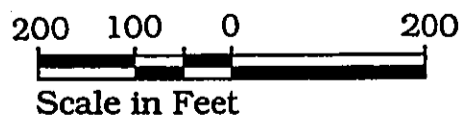


Figure A-19
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



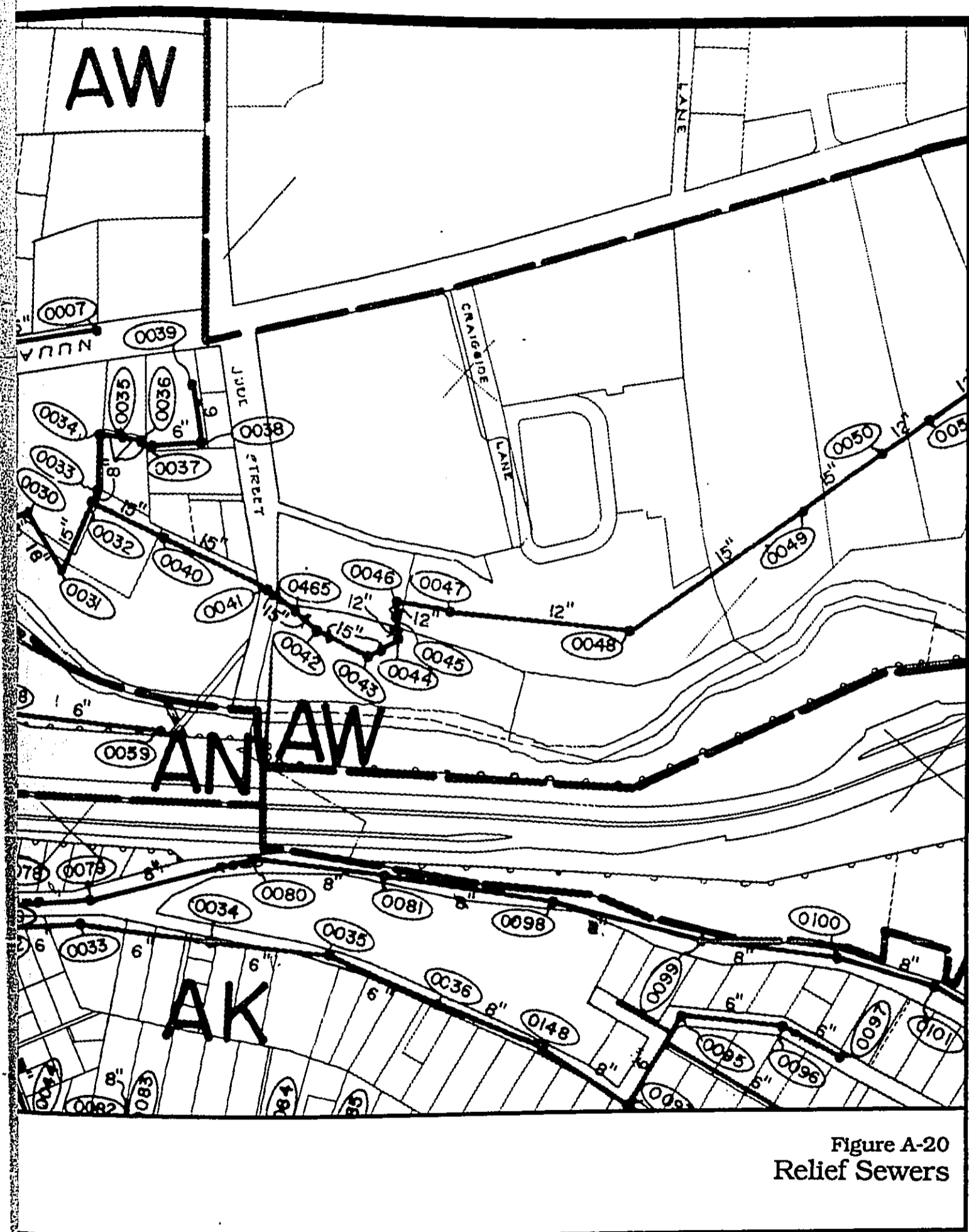
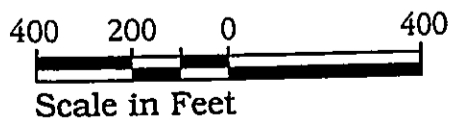
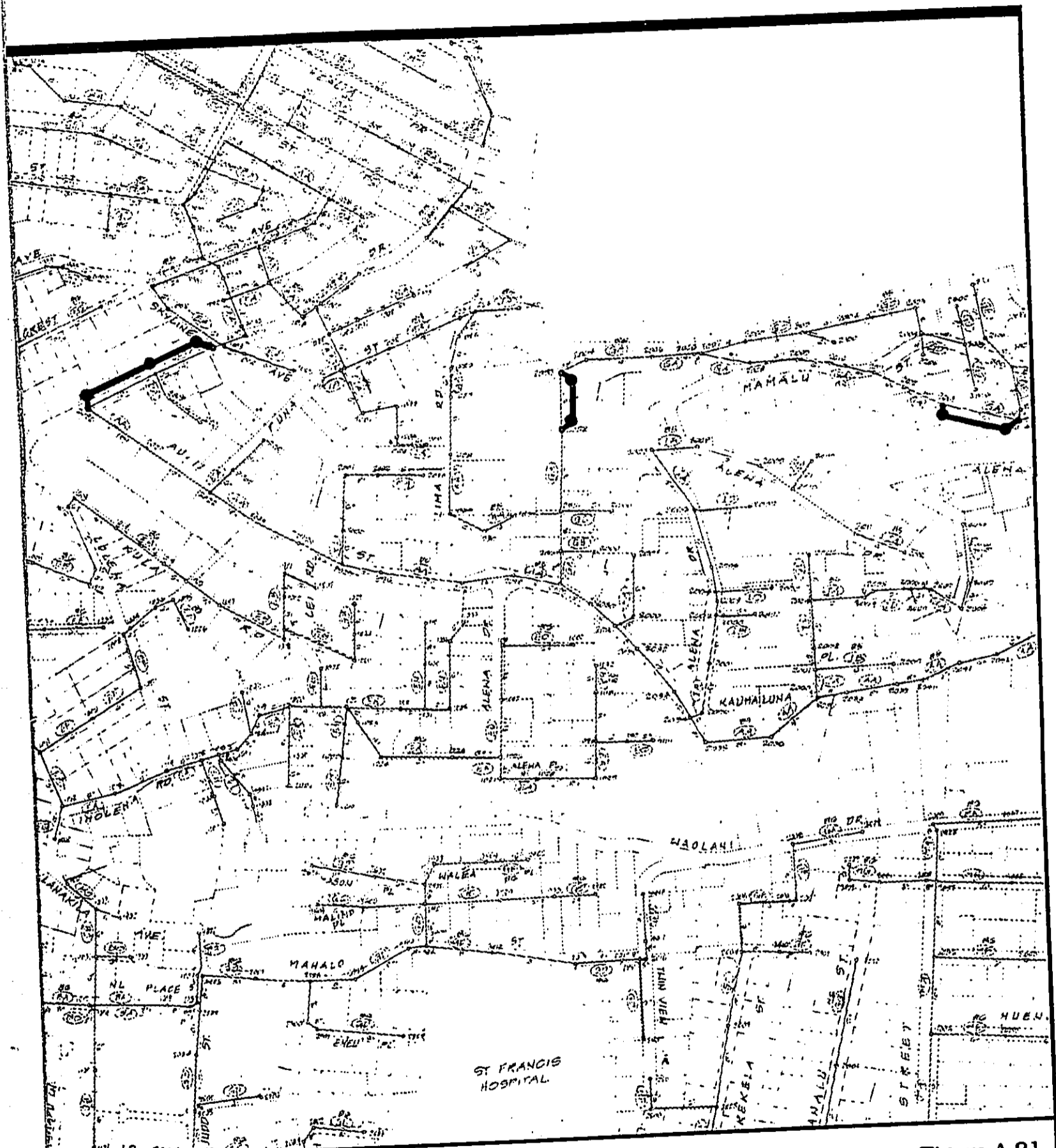


Figure A-20
Relief Sewers



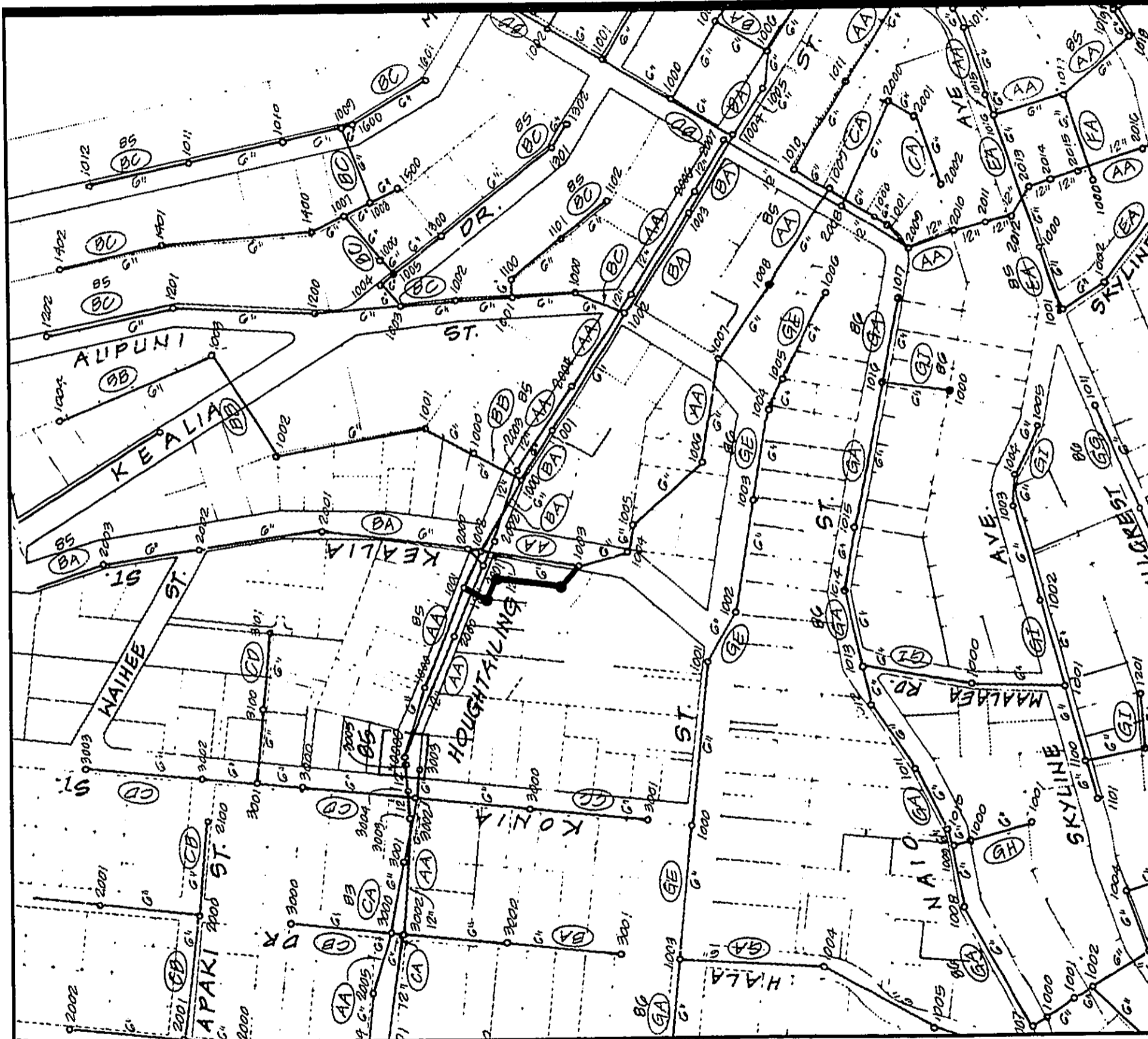
EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993





ST FRANCIS
HOSPITAL

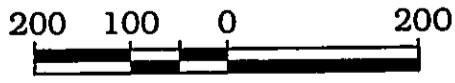
Figure A-21
Relief Sewers



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT

BELT COLLINS HAWAII • DECEMBER 1993



Scale in Feet



North

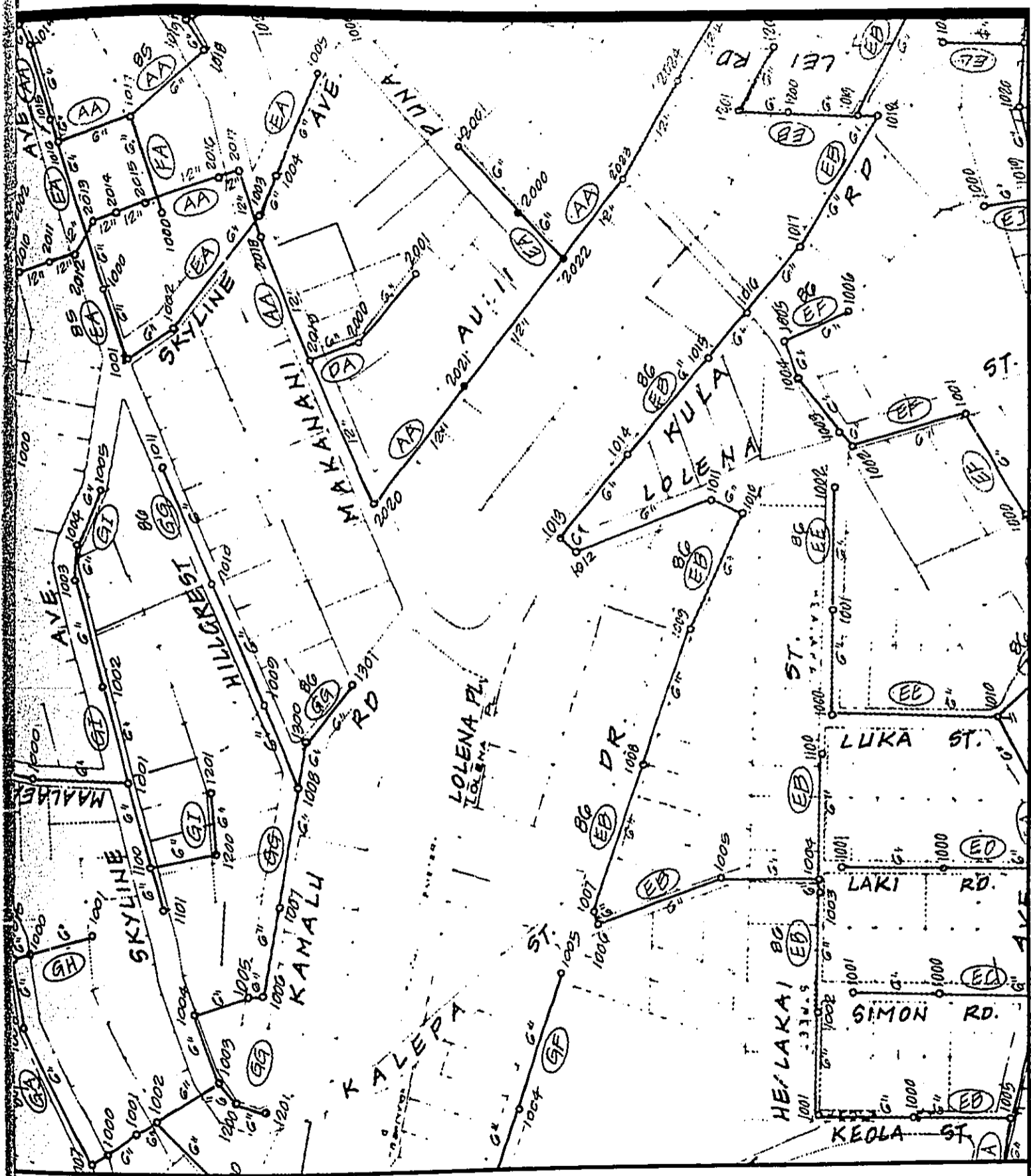
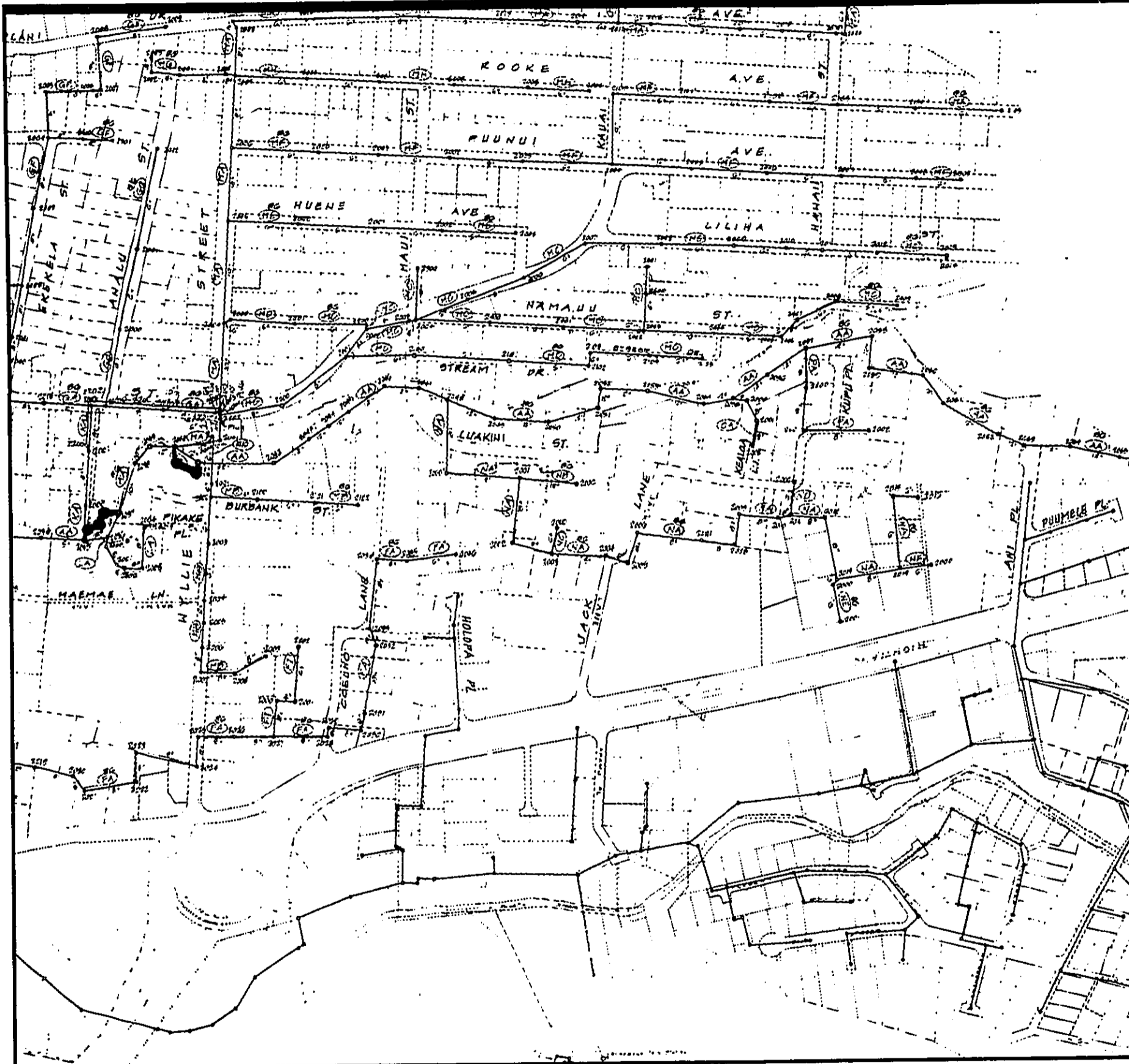


Figure A-22
Relief Sewers



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT

BELT COLLINS HAWAII • DECEMBER 1993

200 100 0 200



Scale in Feet



North

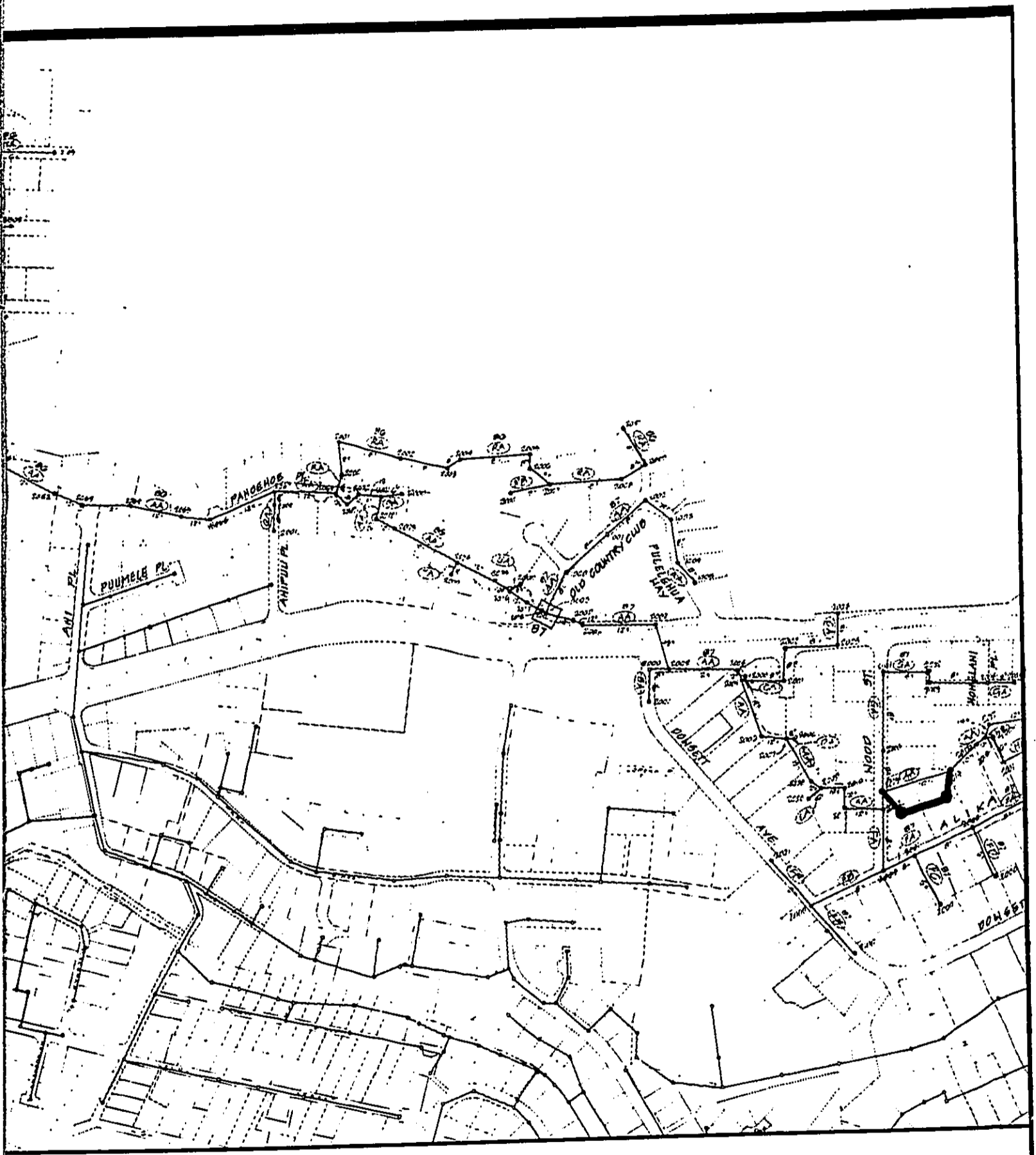
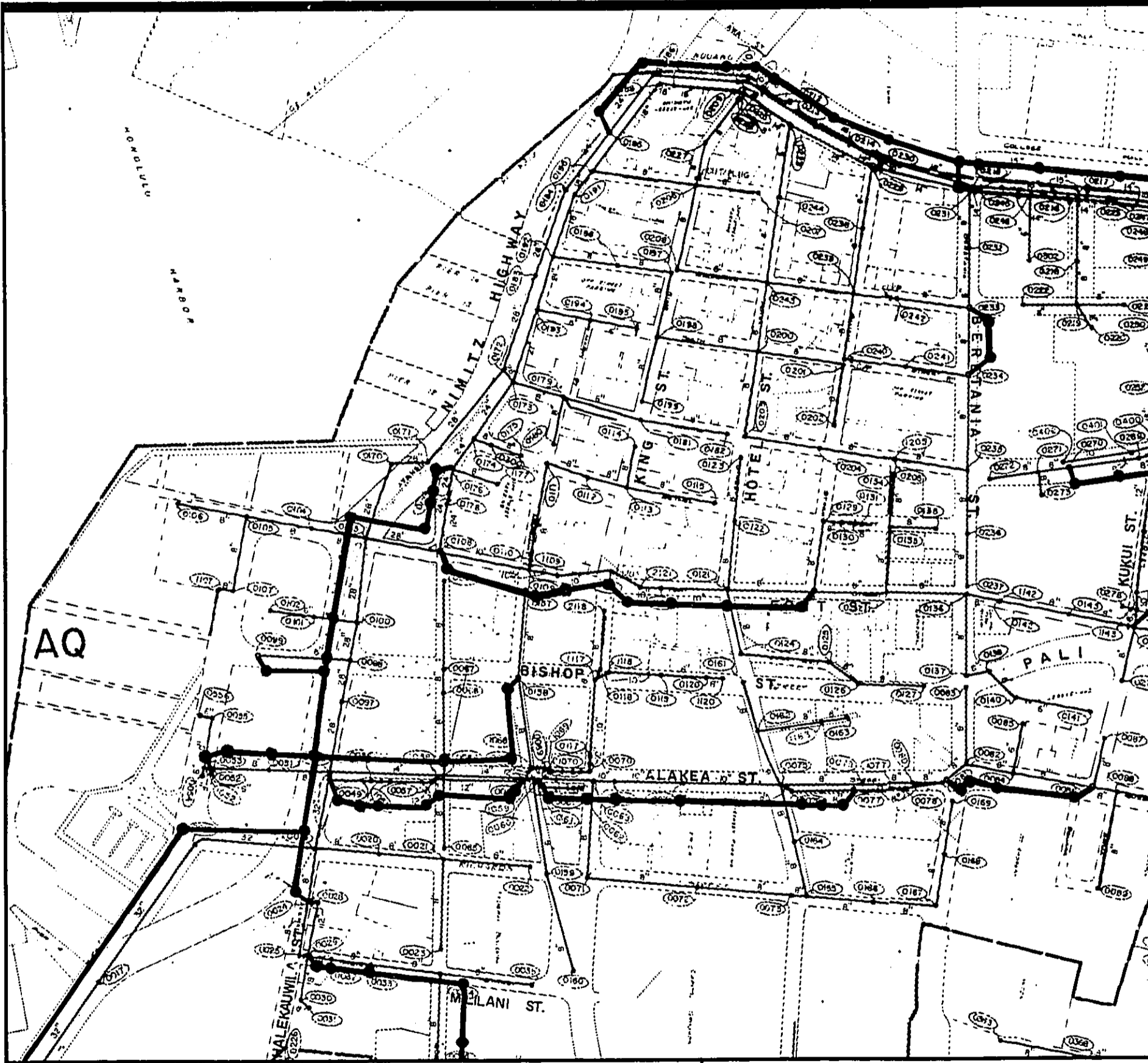
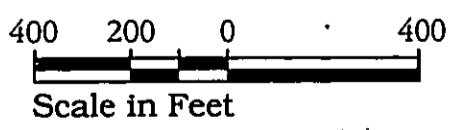


Figure A-23
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



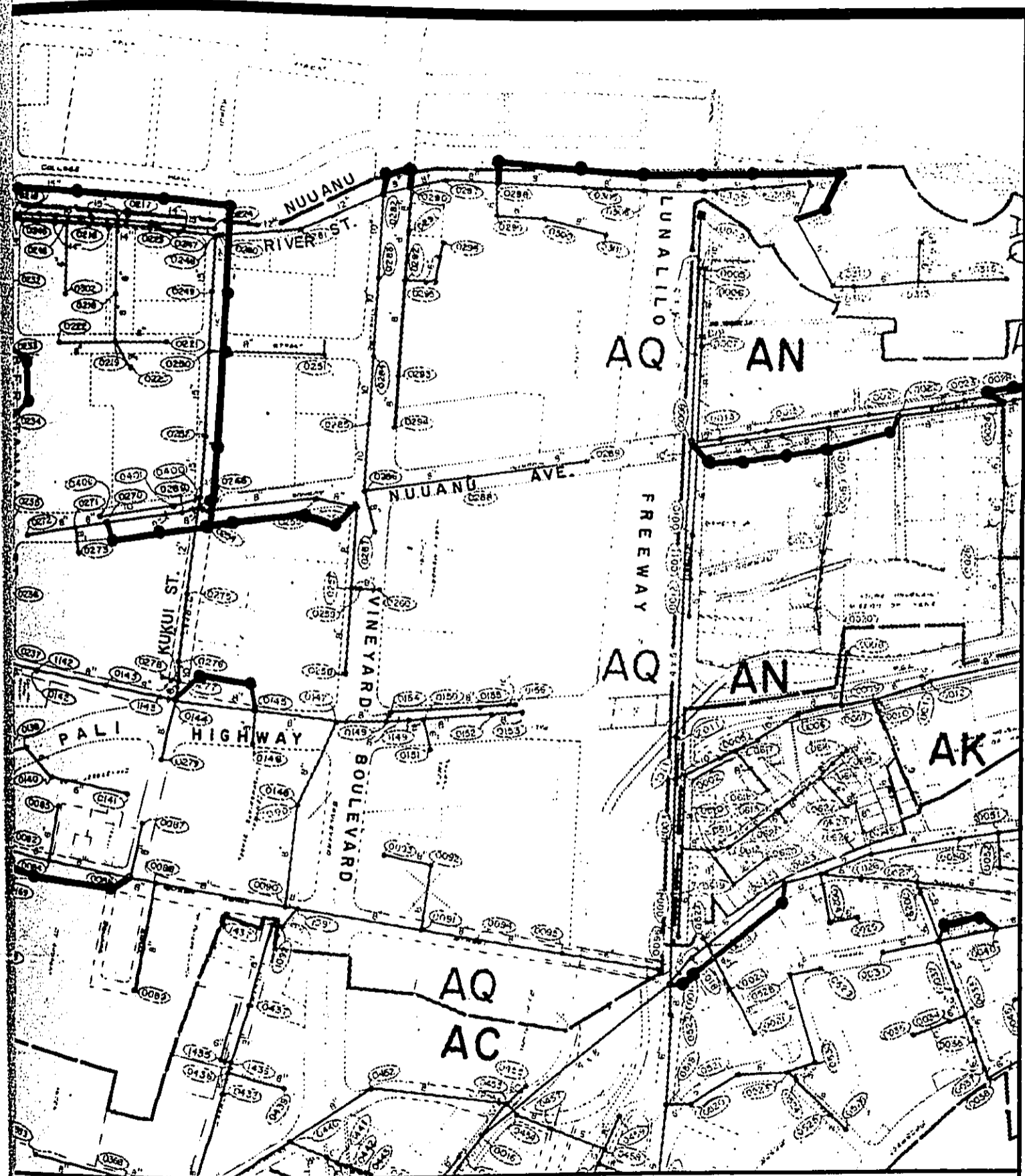
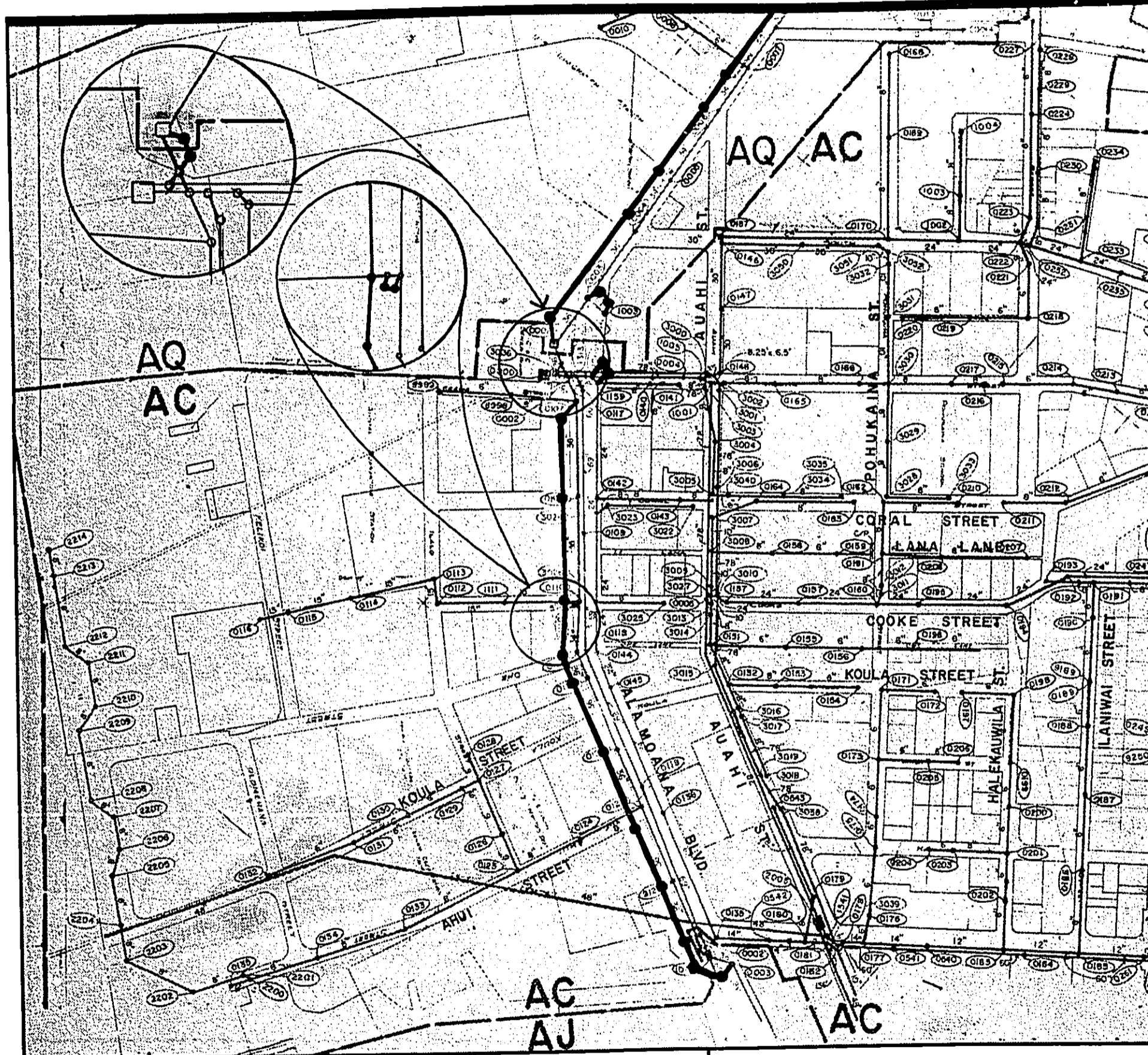
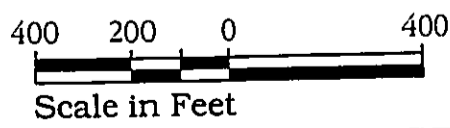


Figure A-24
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



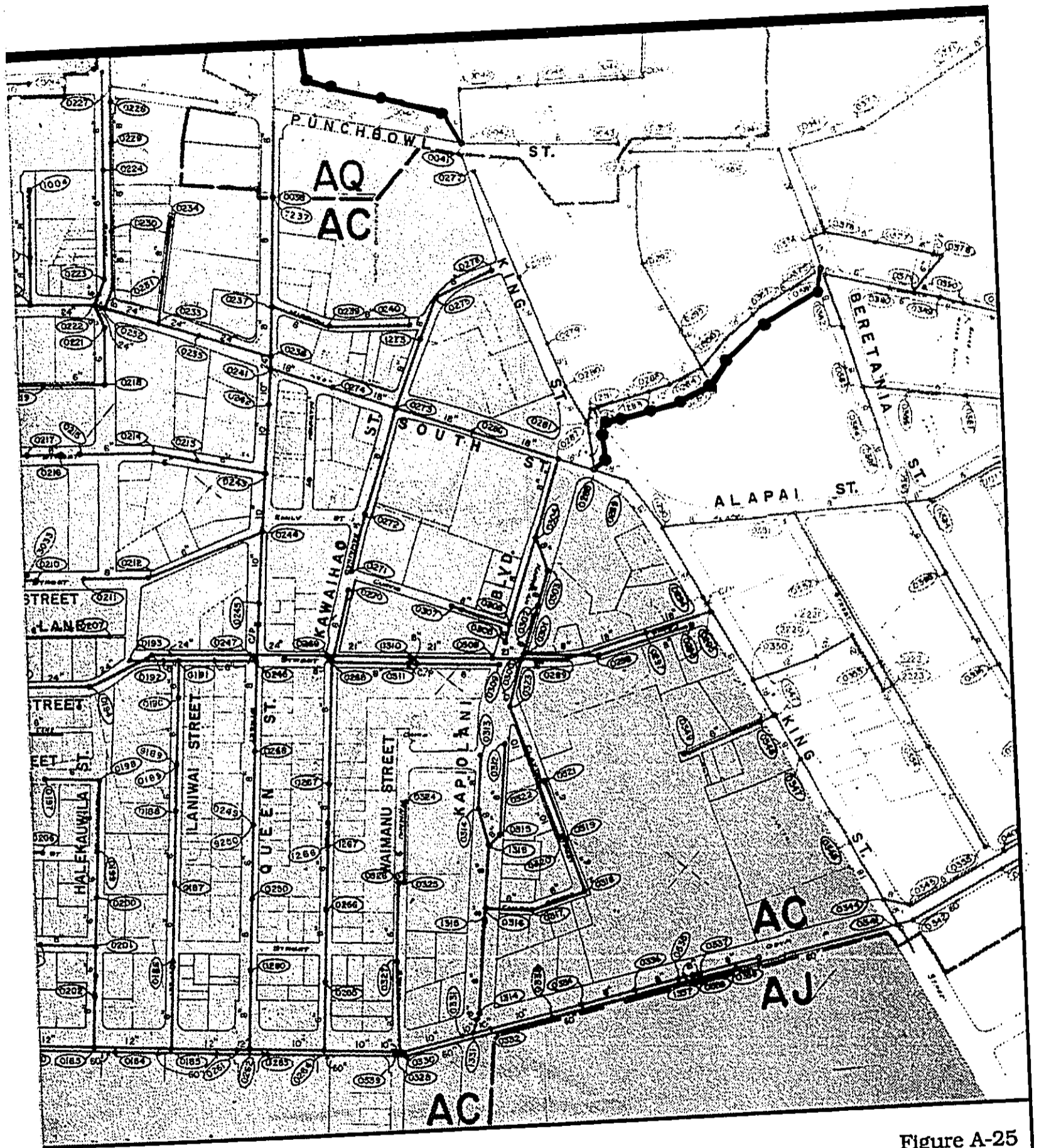
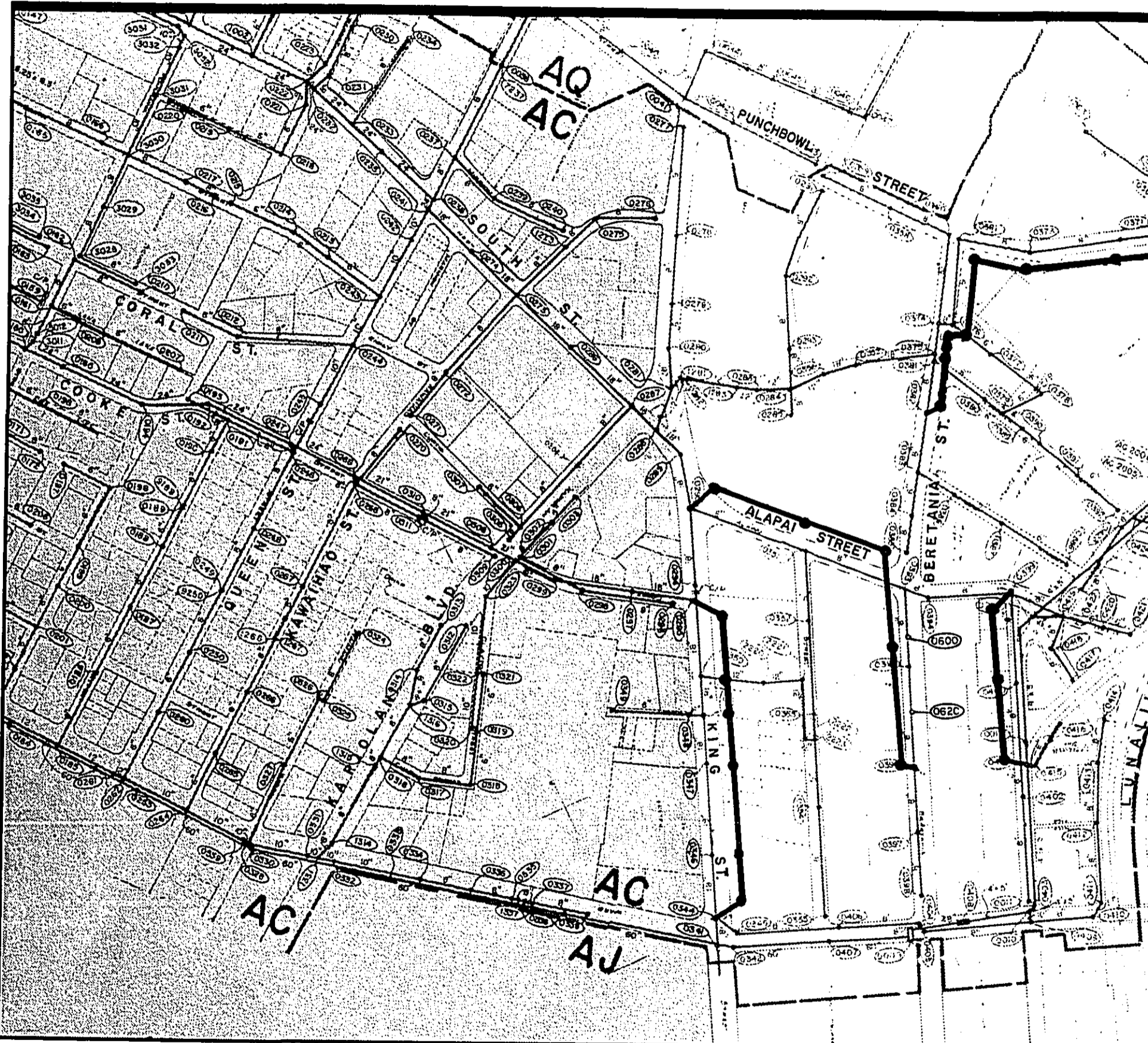


Figure A-25
Relief Sewers



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT

BELT COLLINS HAWAII • DECEMBER 1993

400 200 0 400



Scale in Feet



North

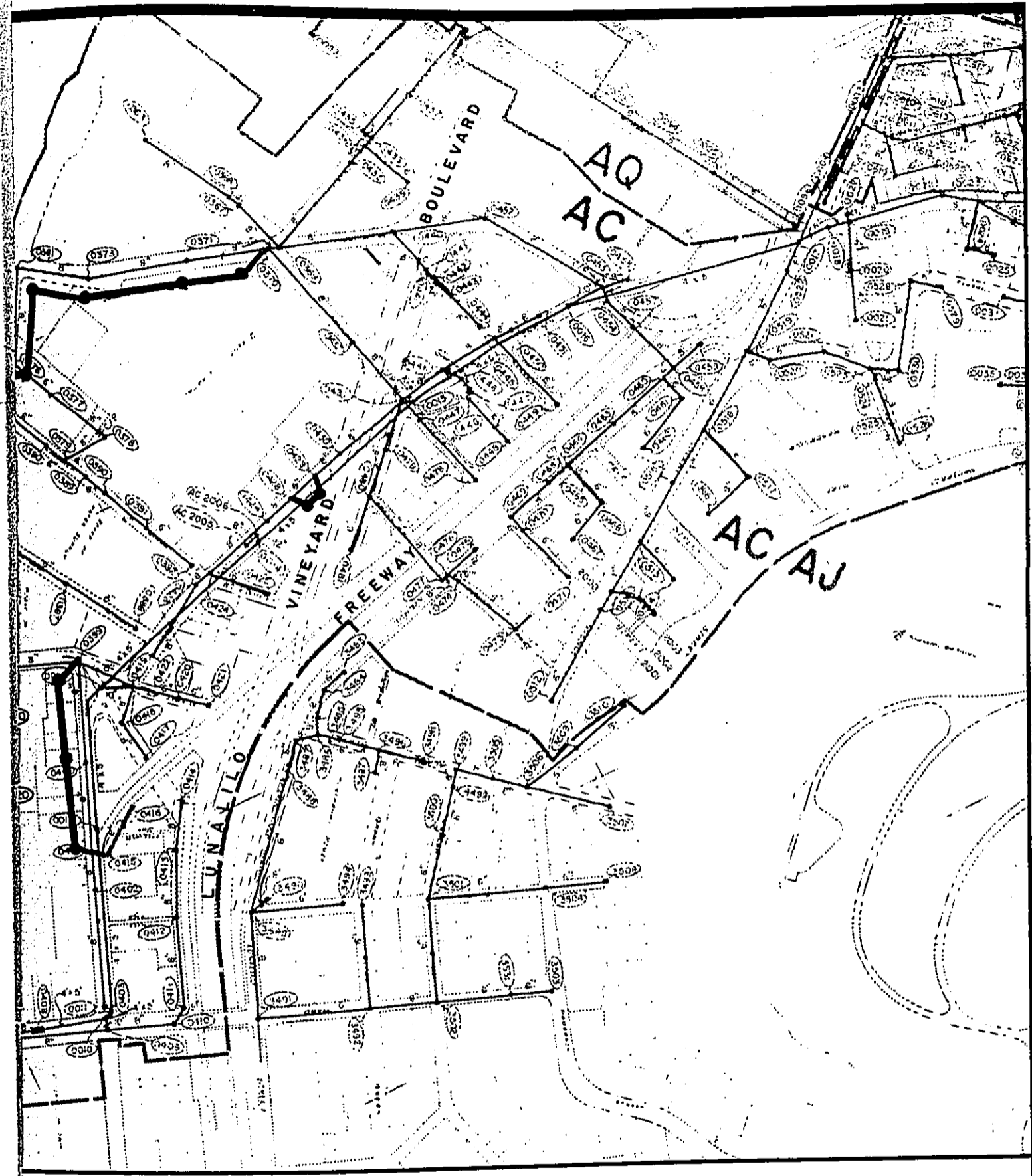
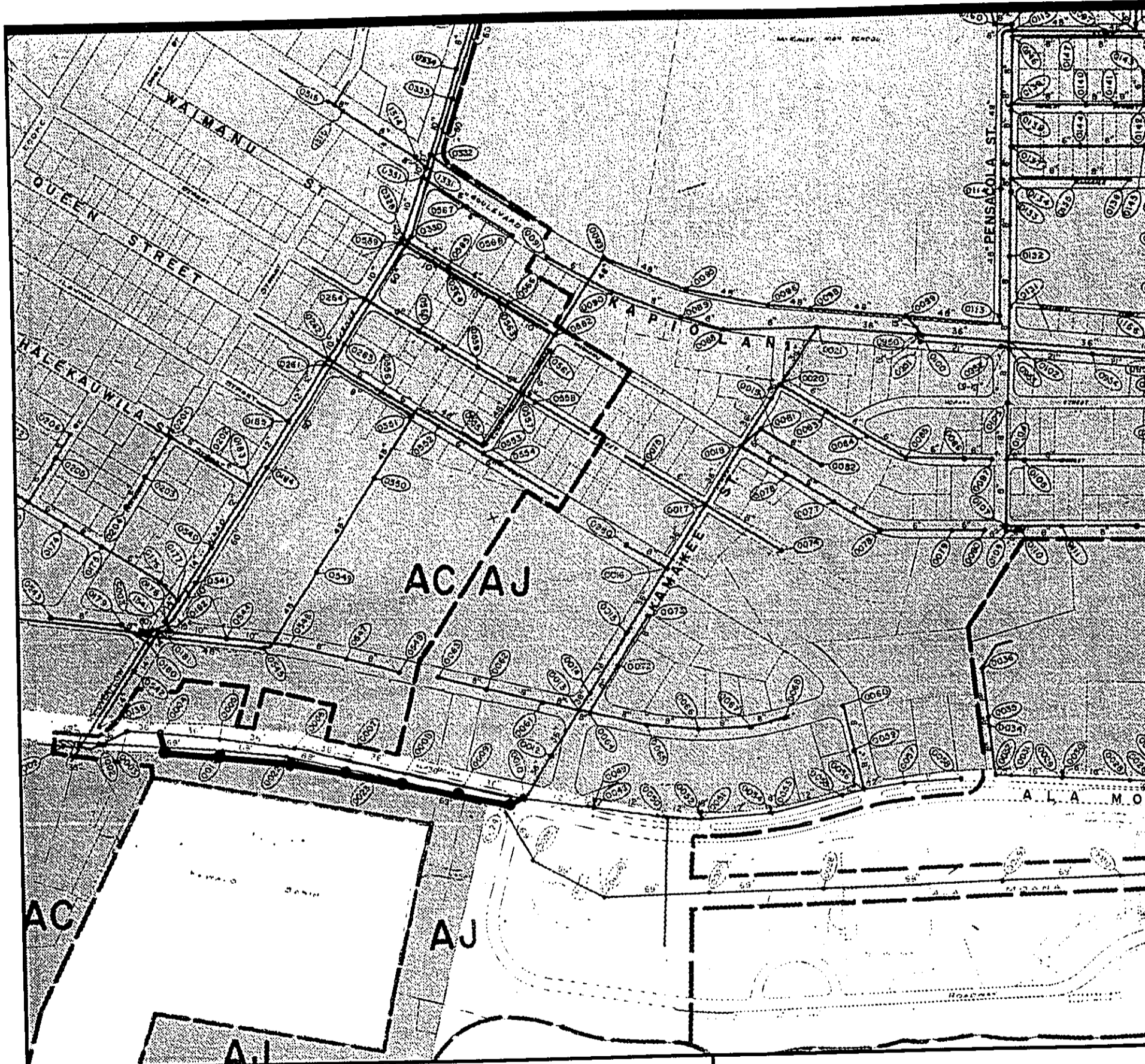
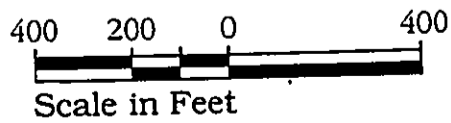


Figure A-26
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



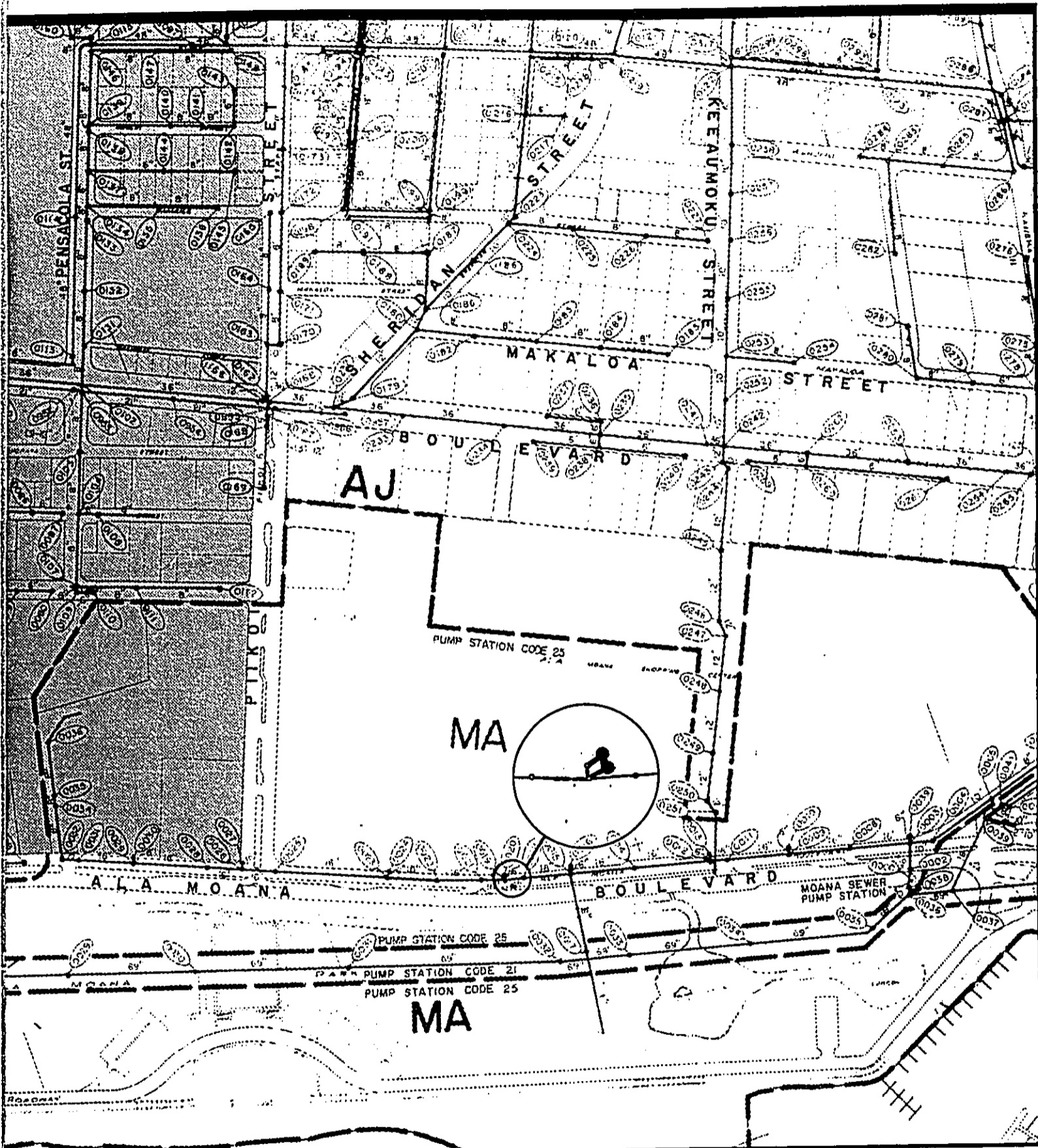
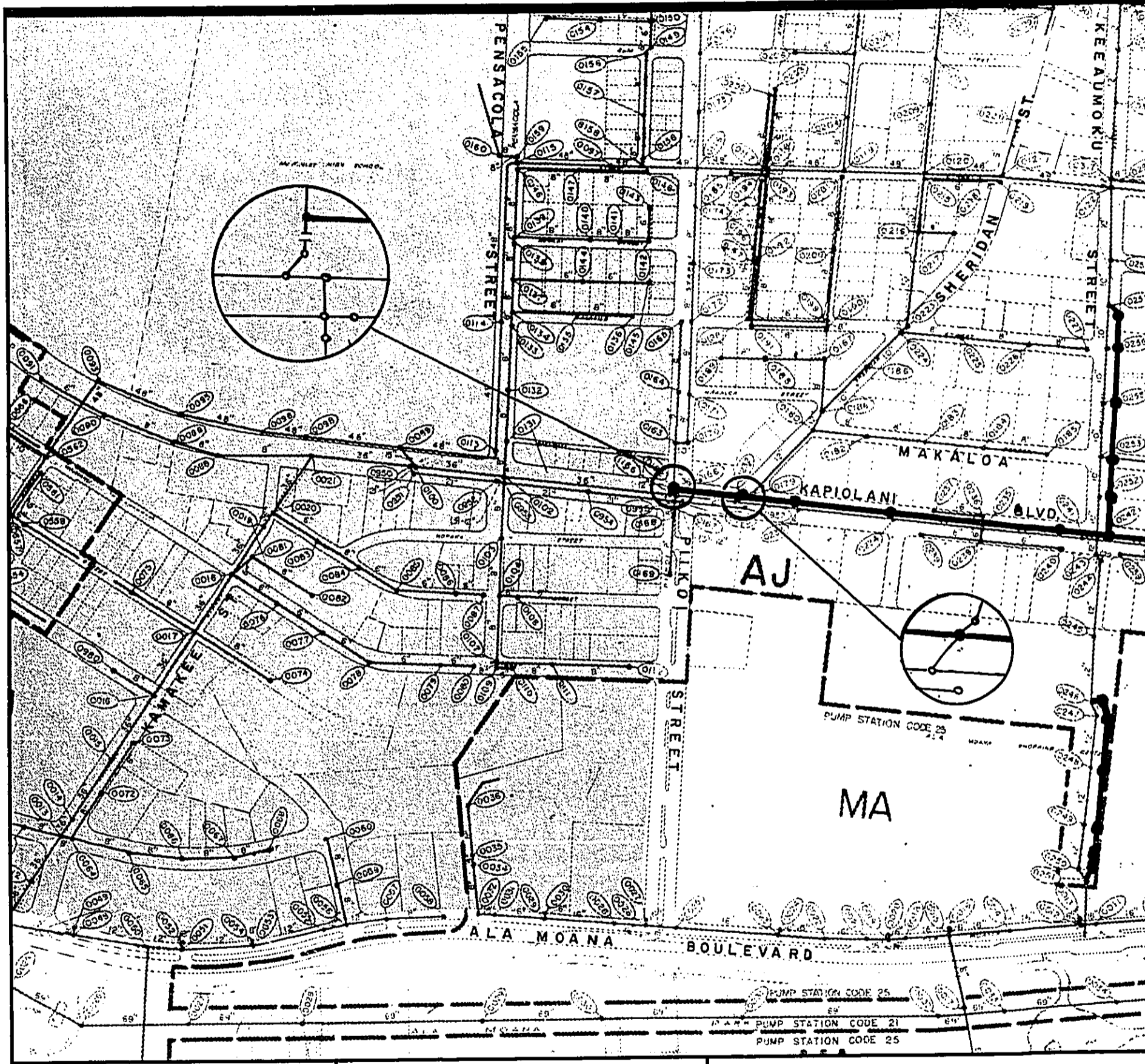
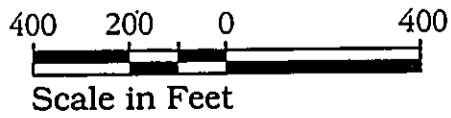


Figure A-27
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



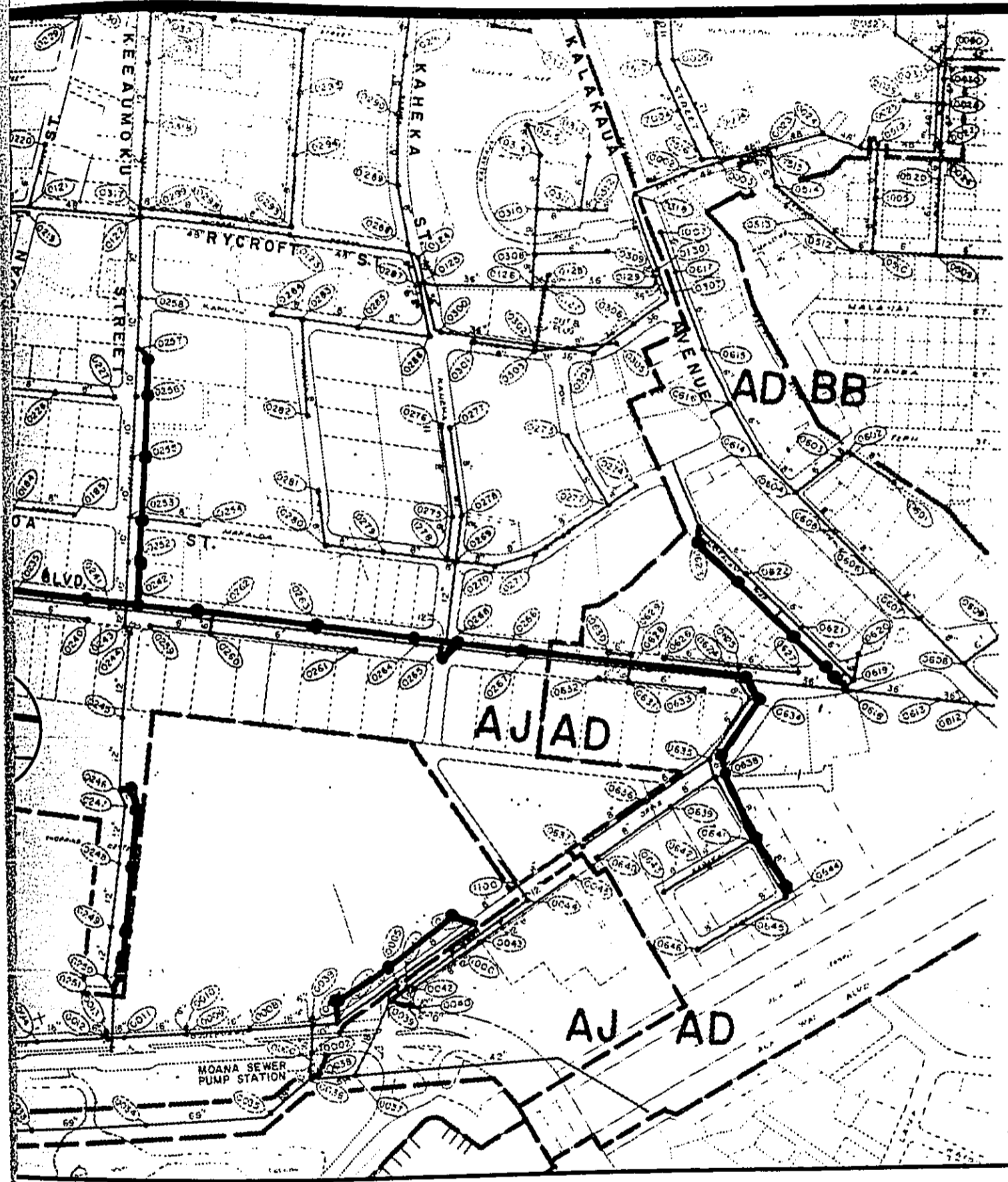
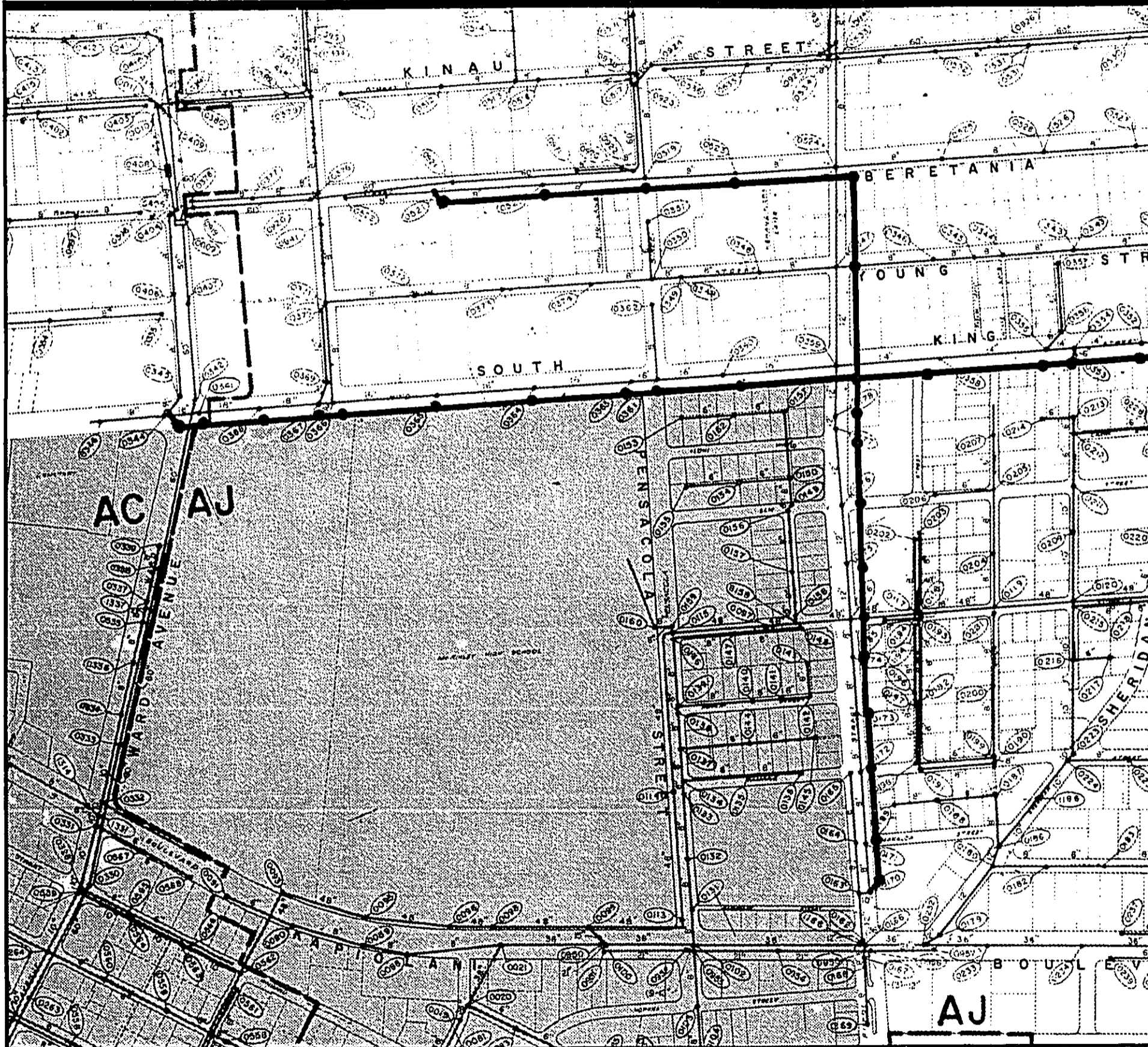
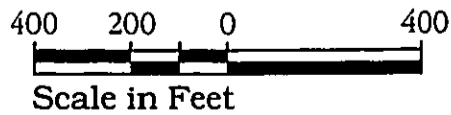


Figure A-28
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



North

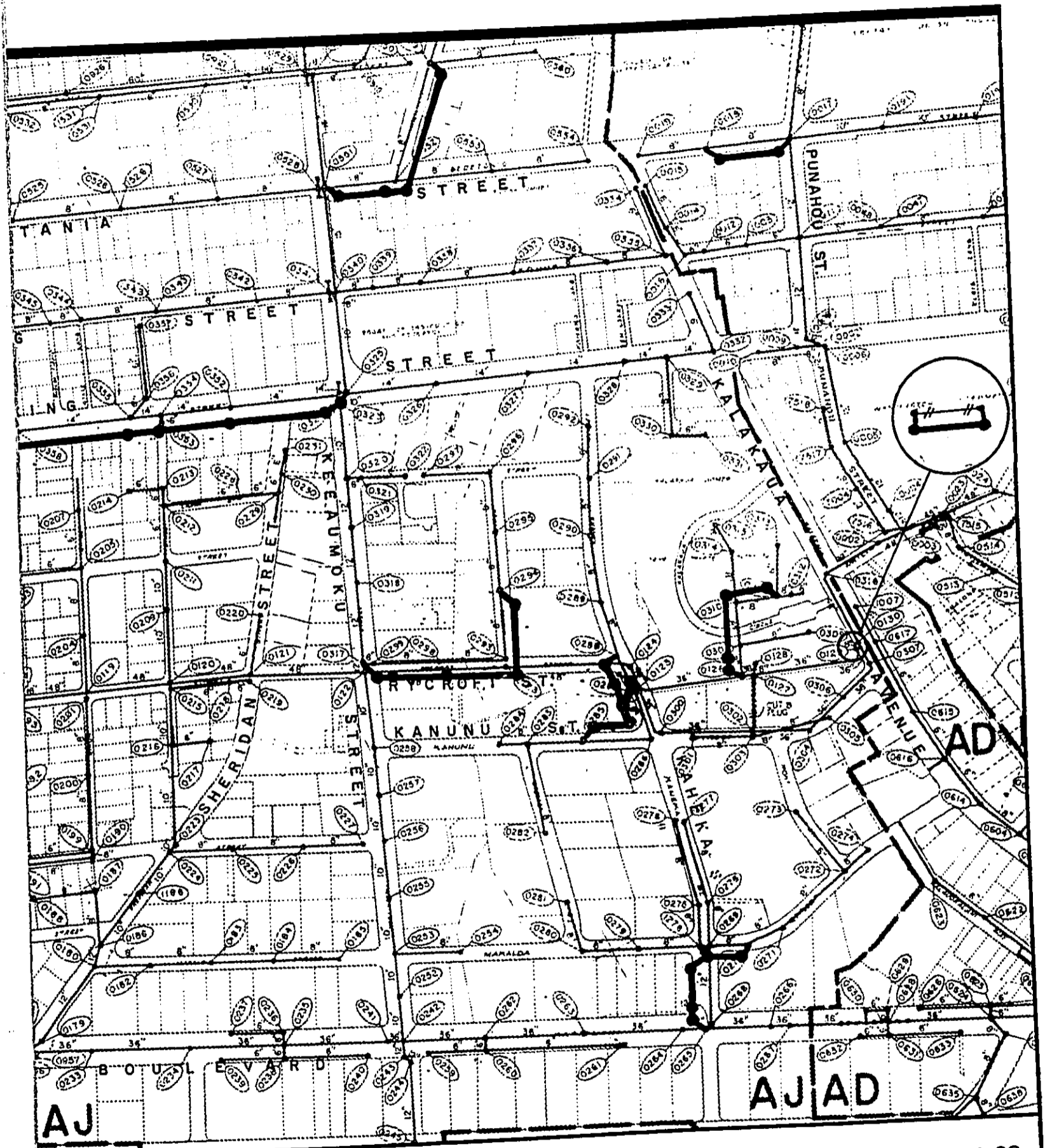
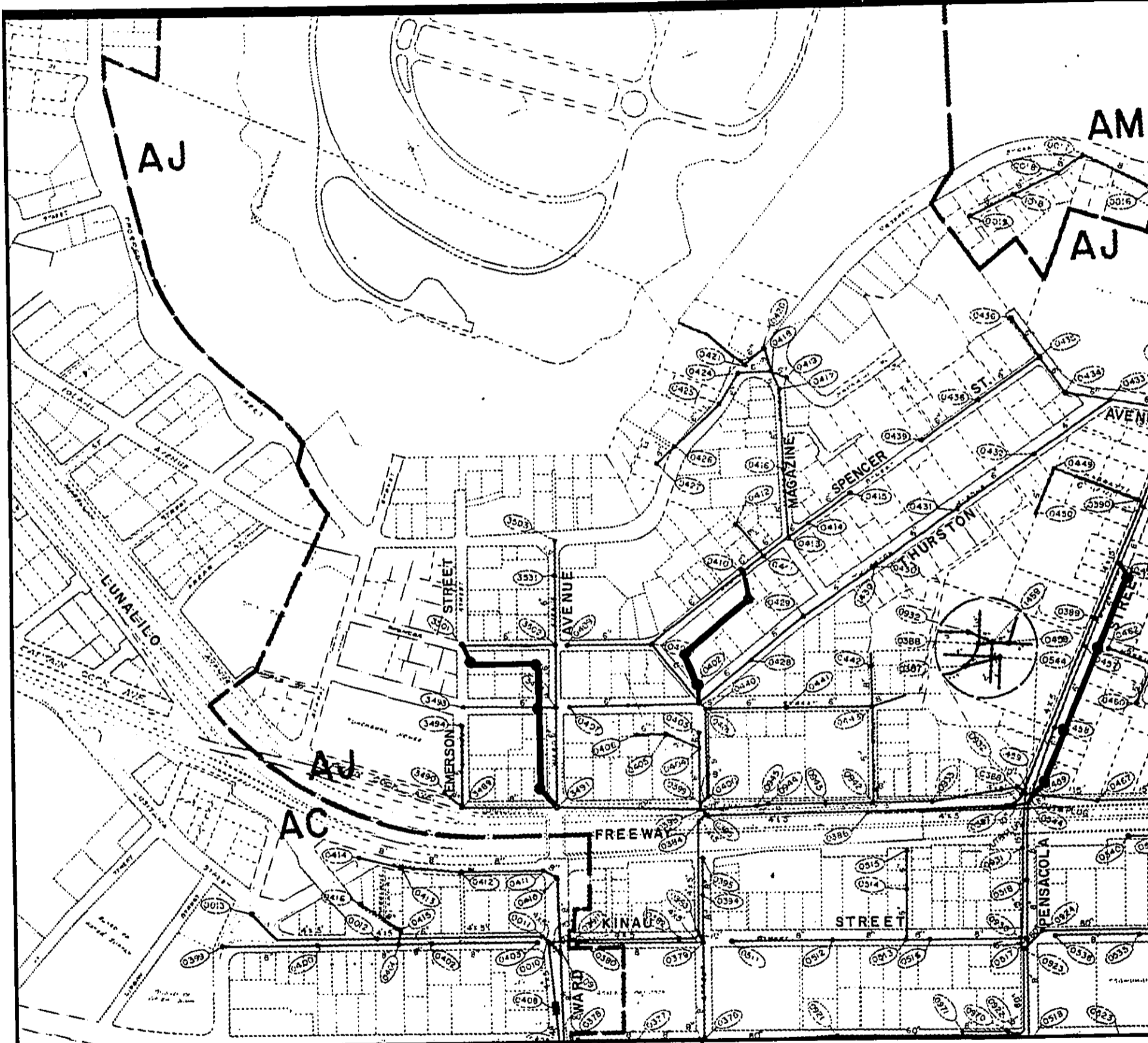
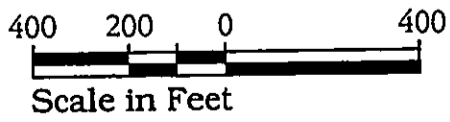


Figure A-29.
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



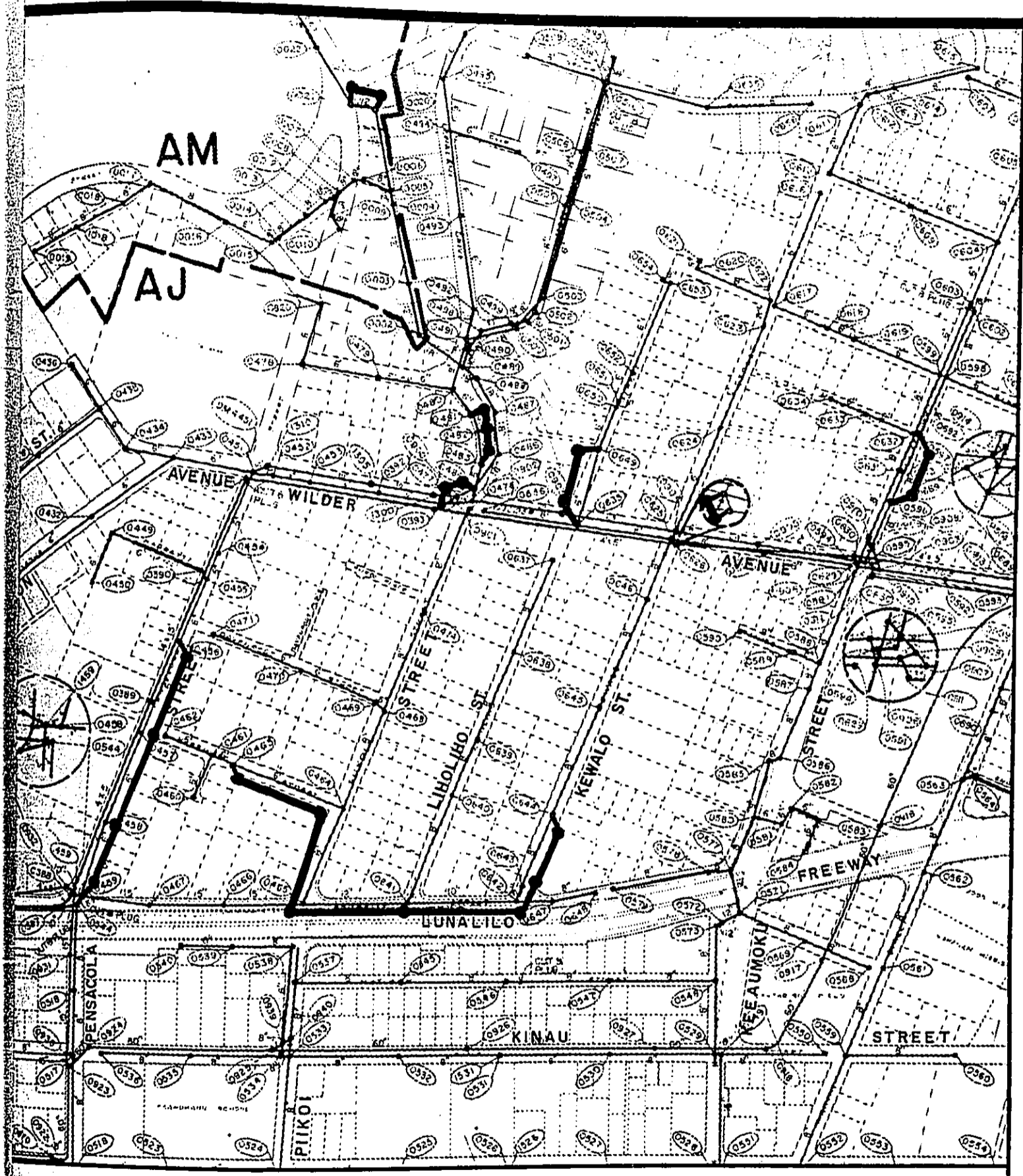
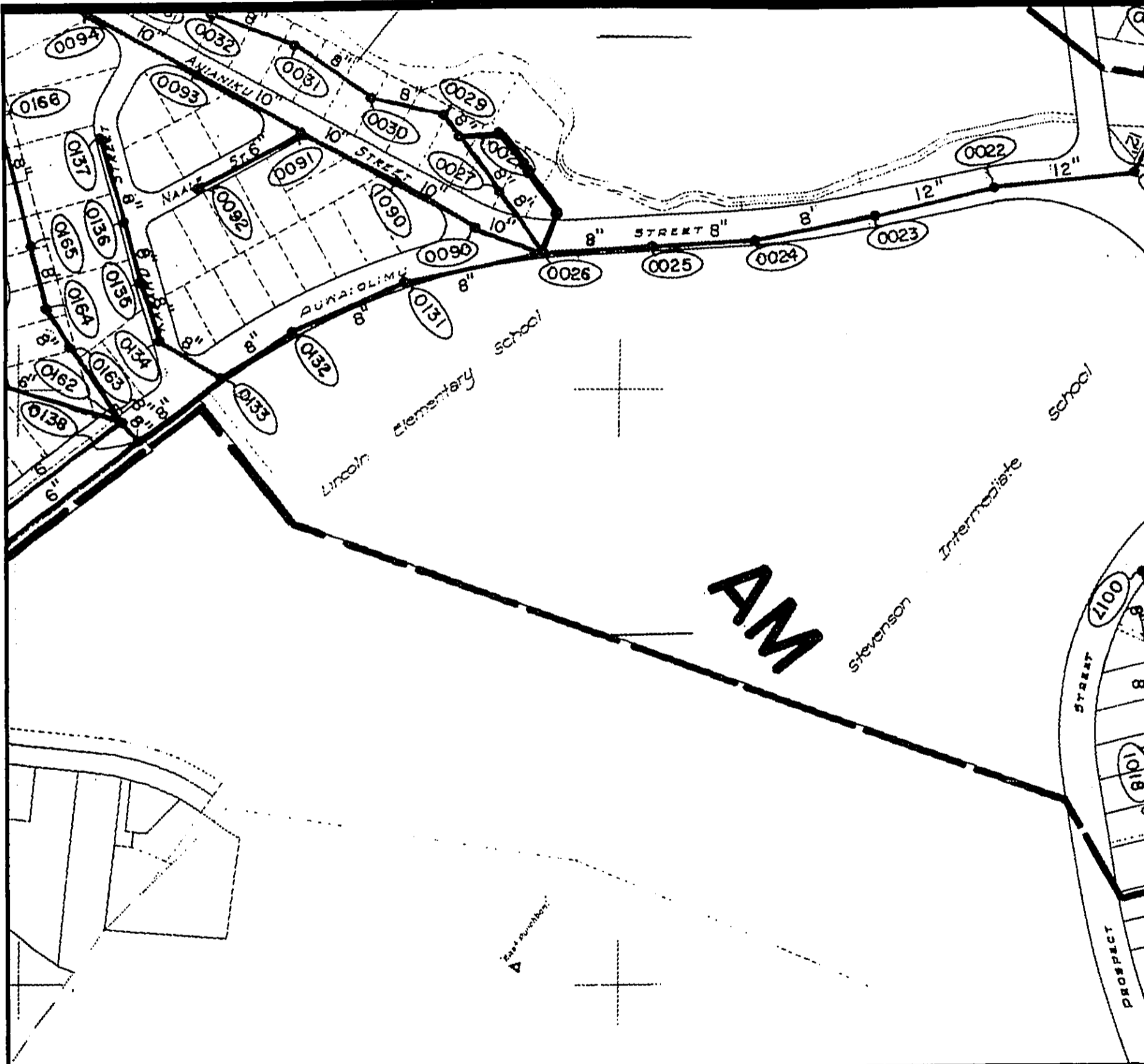
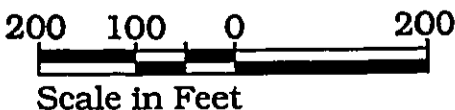


Figure A-30
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



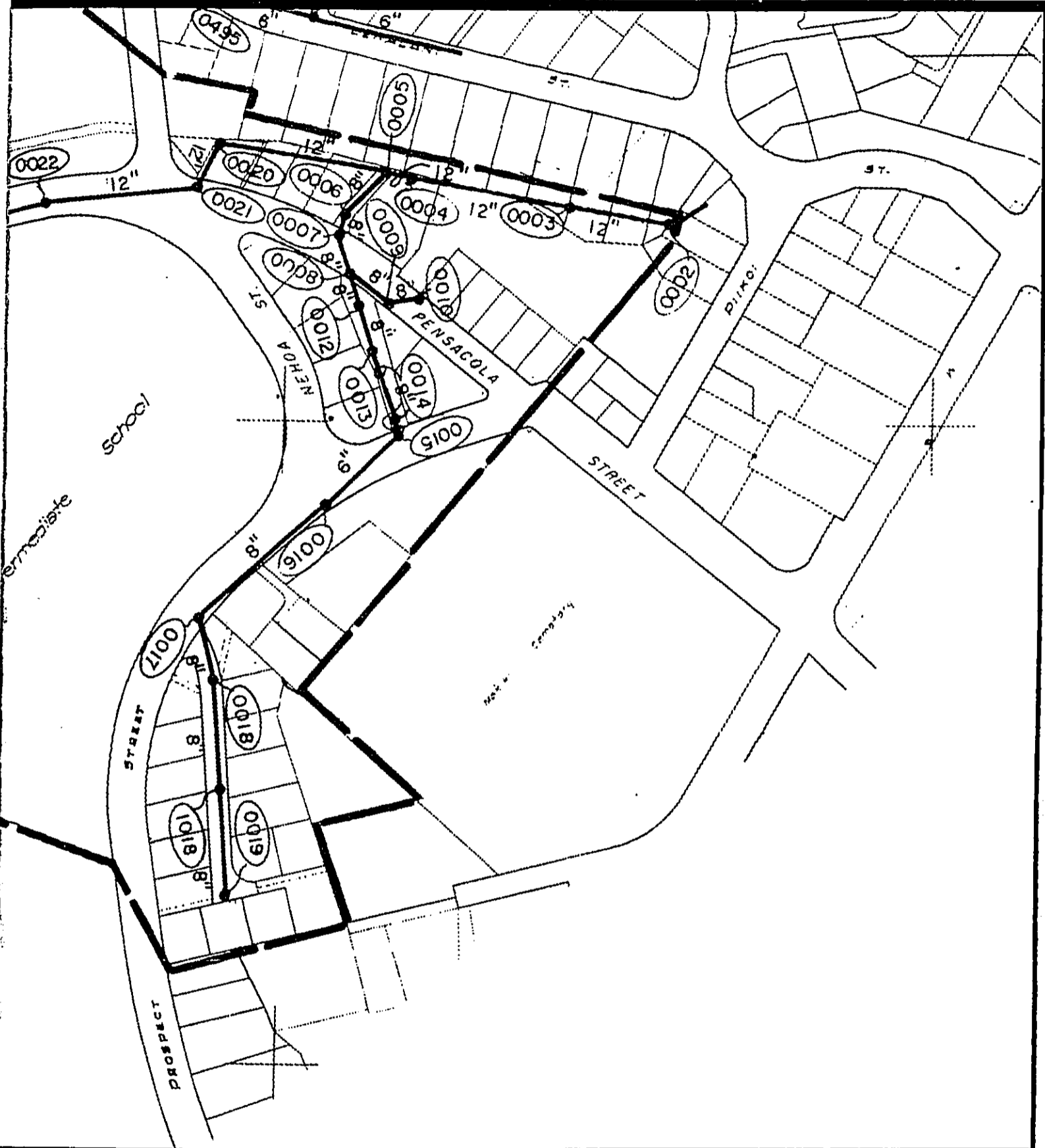
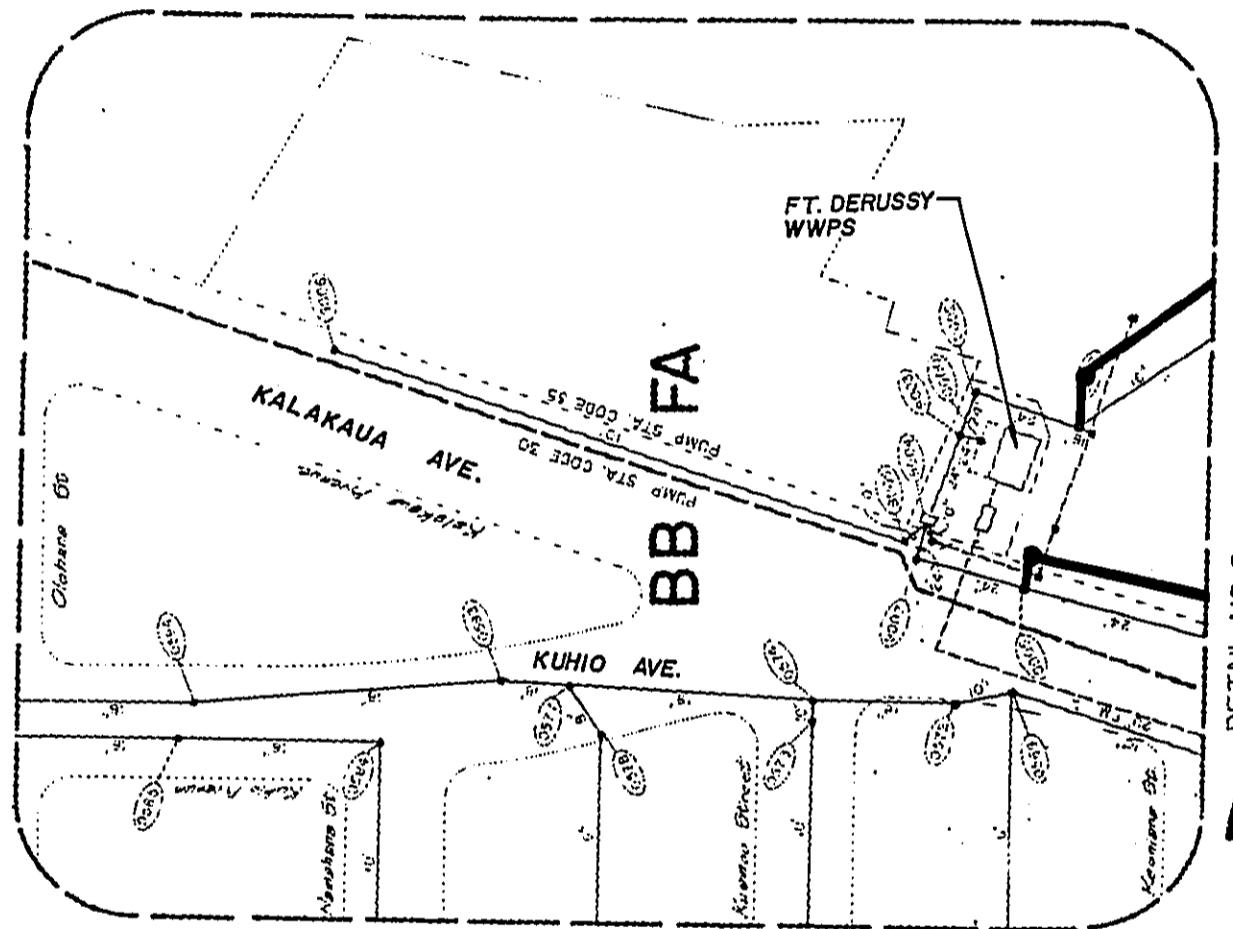
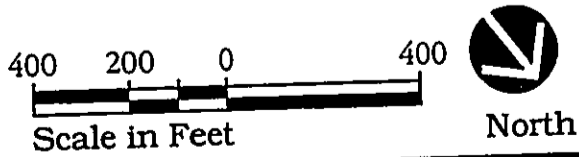


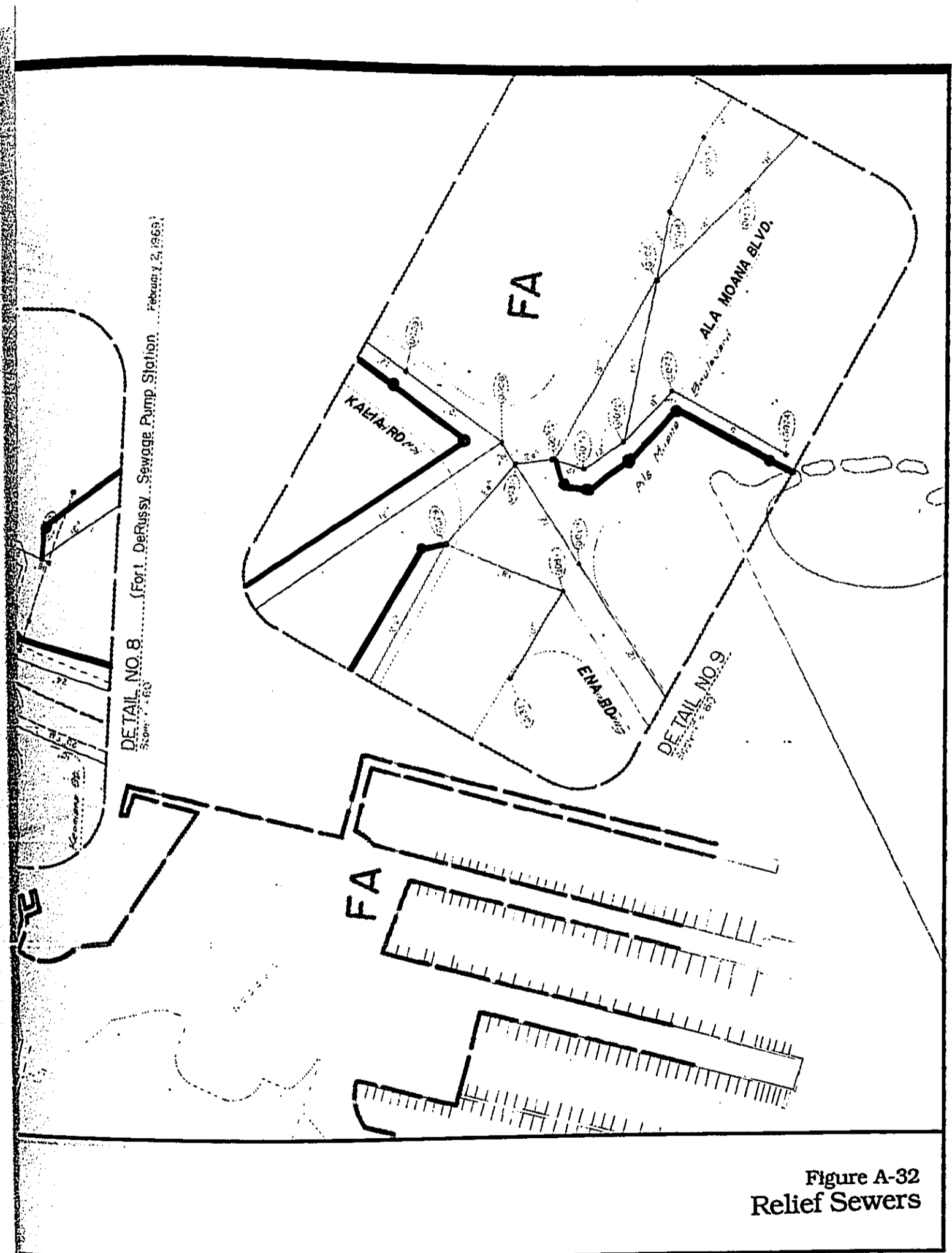
Figure A-31
Relief Sewers



DETAIL NO. 8 (Fort. DeRussy Sewage Pump Station, February 2, 1969)
 Scale: 1" = 60'

EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993

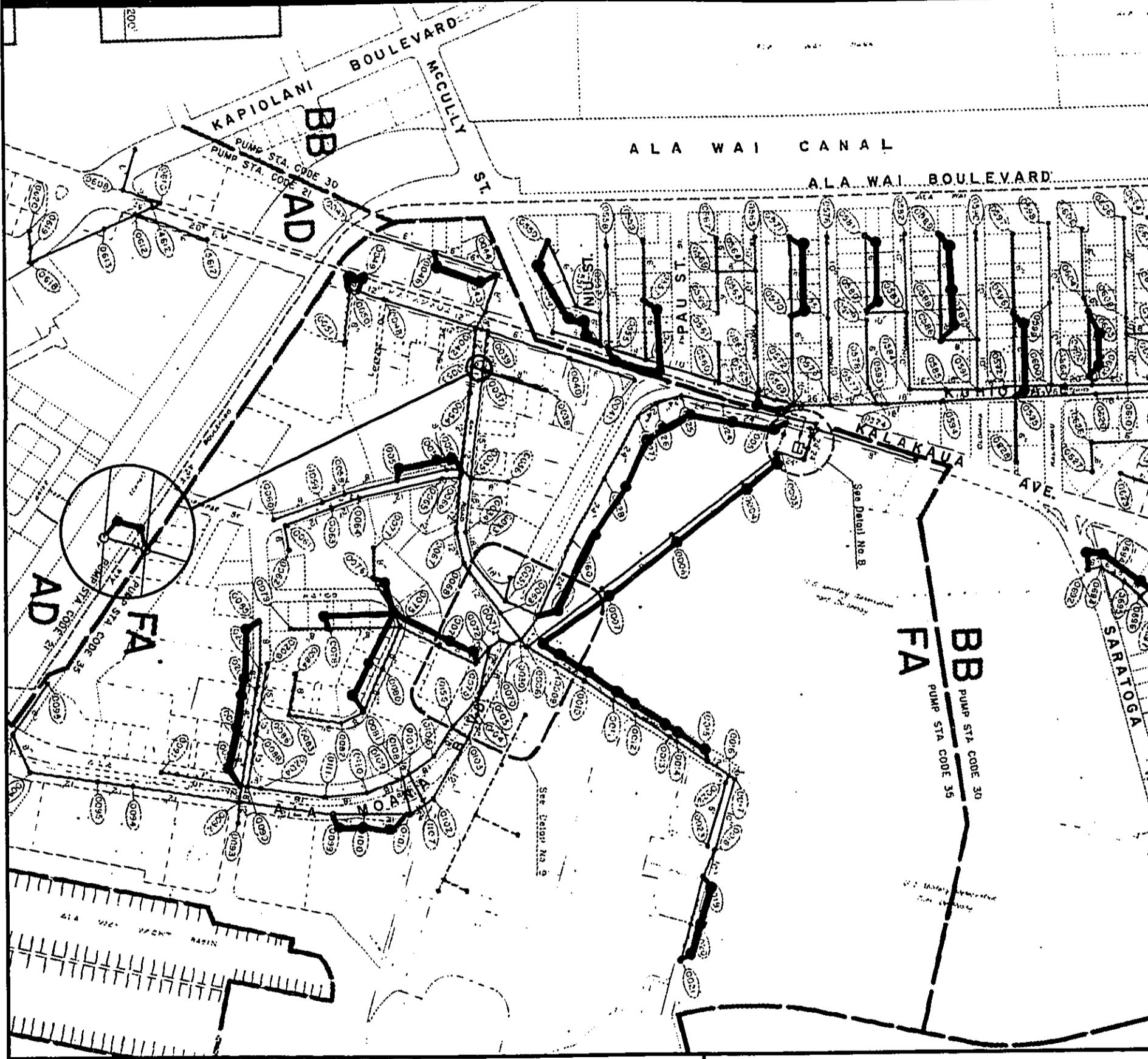




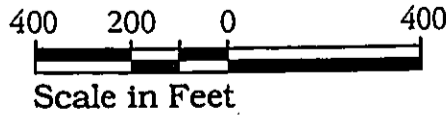
DETAIL NO. 8 (For Fort DeRussy Sewage Pump Station February 2, 1969)
 SLOPE 1:80

DETAIL NO. 9
 SLOPE 1:60

Figure A-32
 Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



North

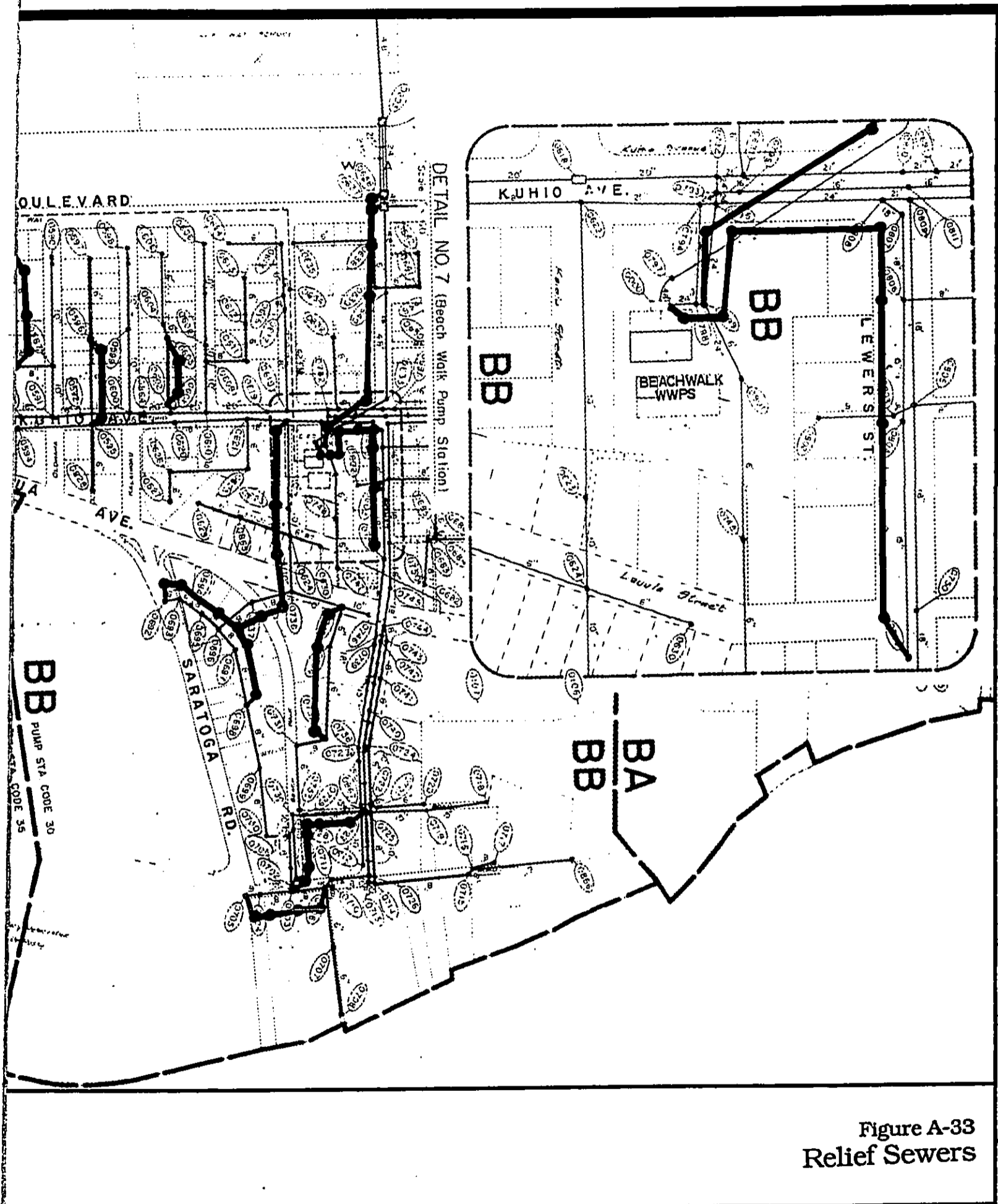
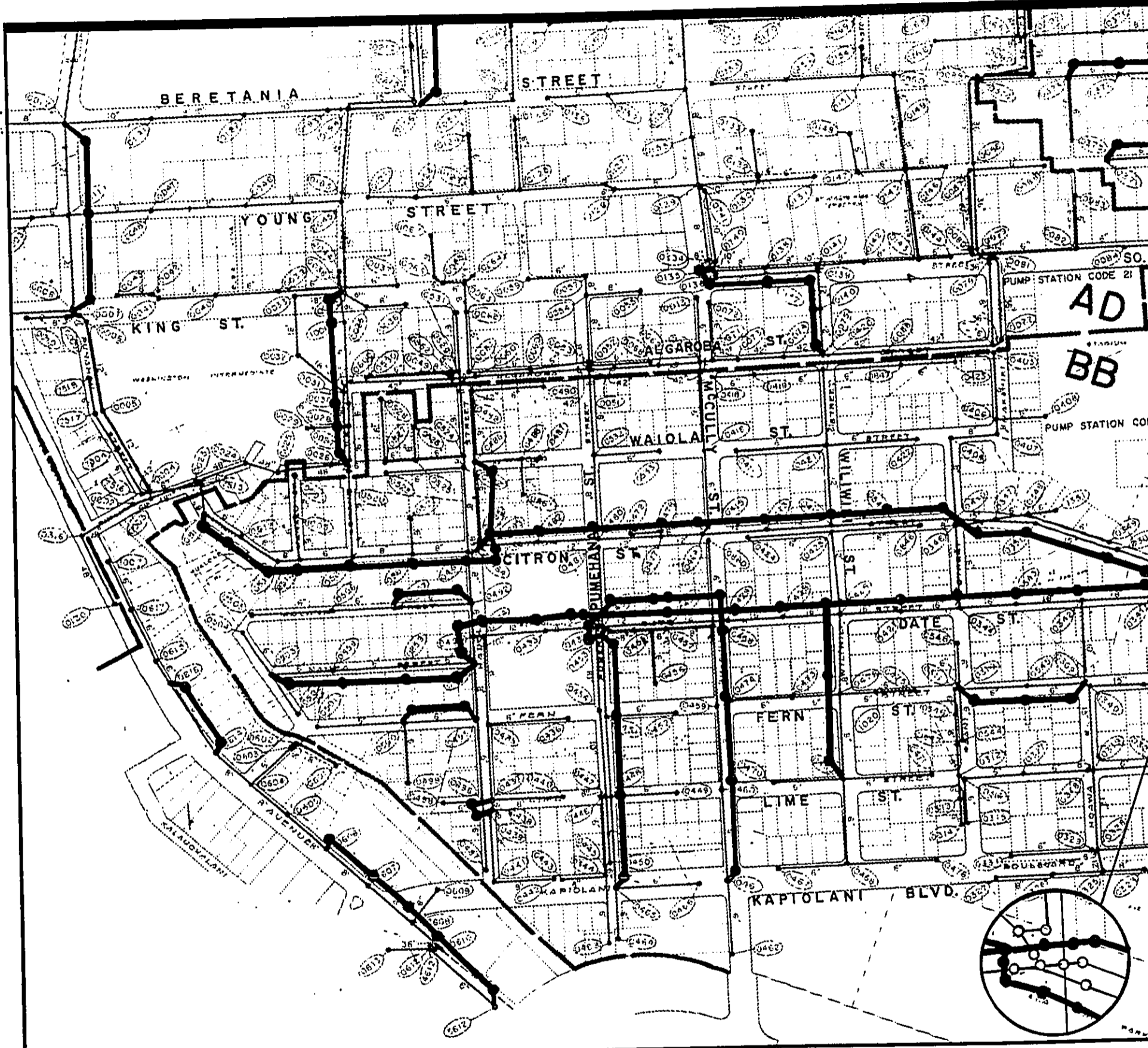
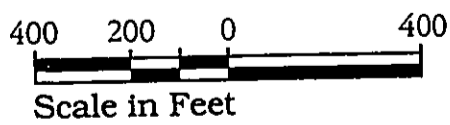


Figure A-33
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



PUMP STATION CODE 21
AD
BB
 PUMP STATION CODE

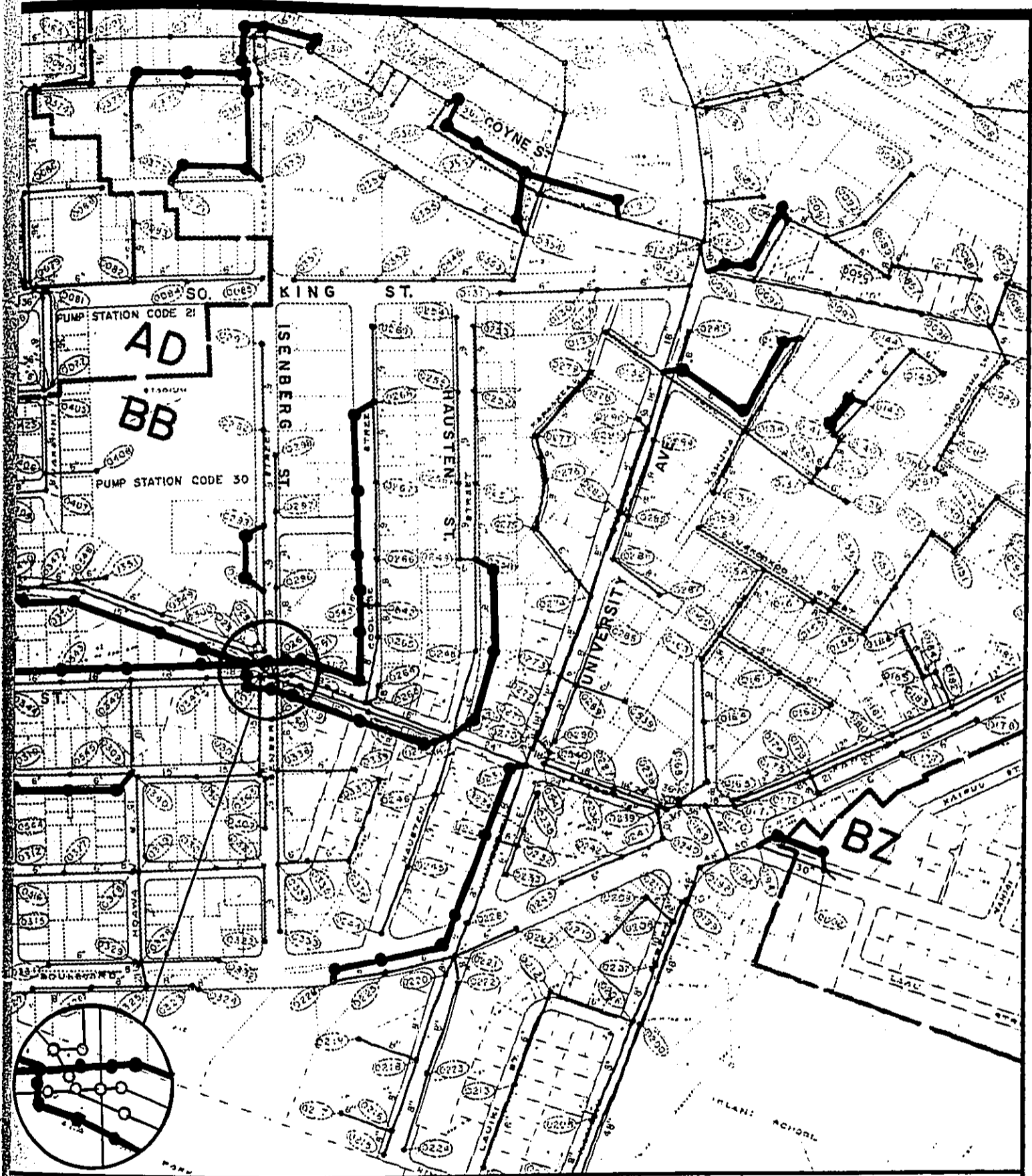
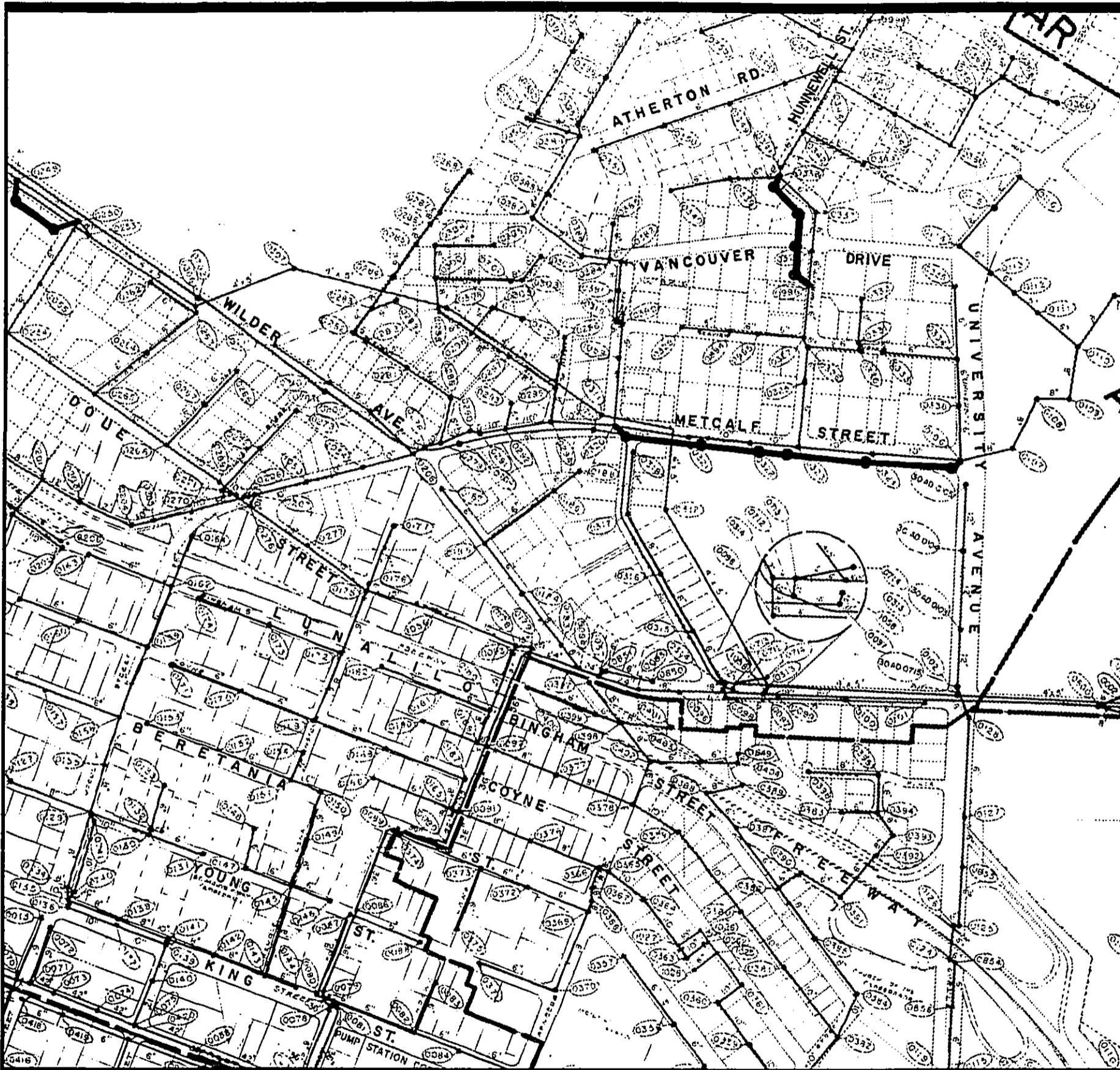
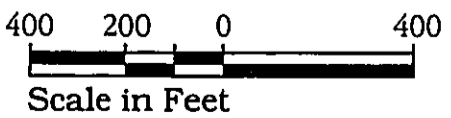


Figure A-34
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



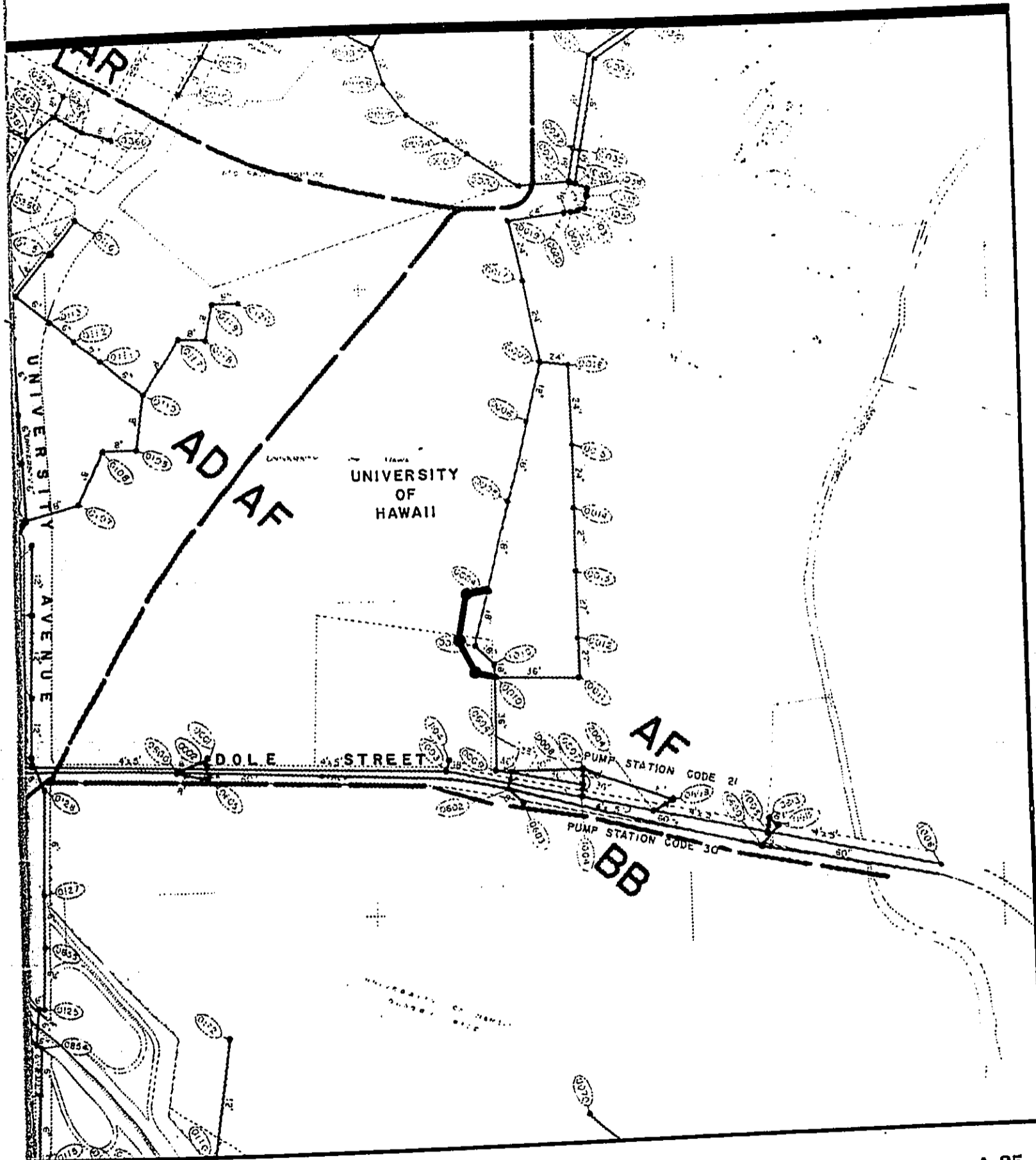
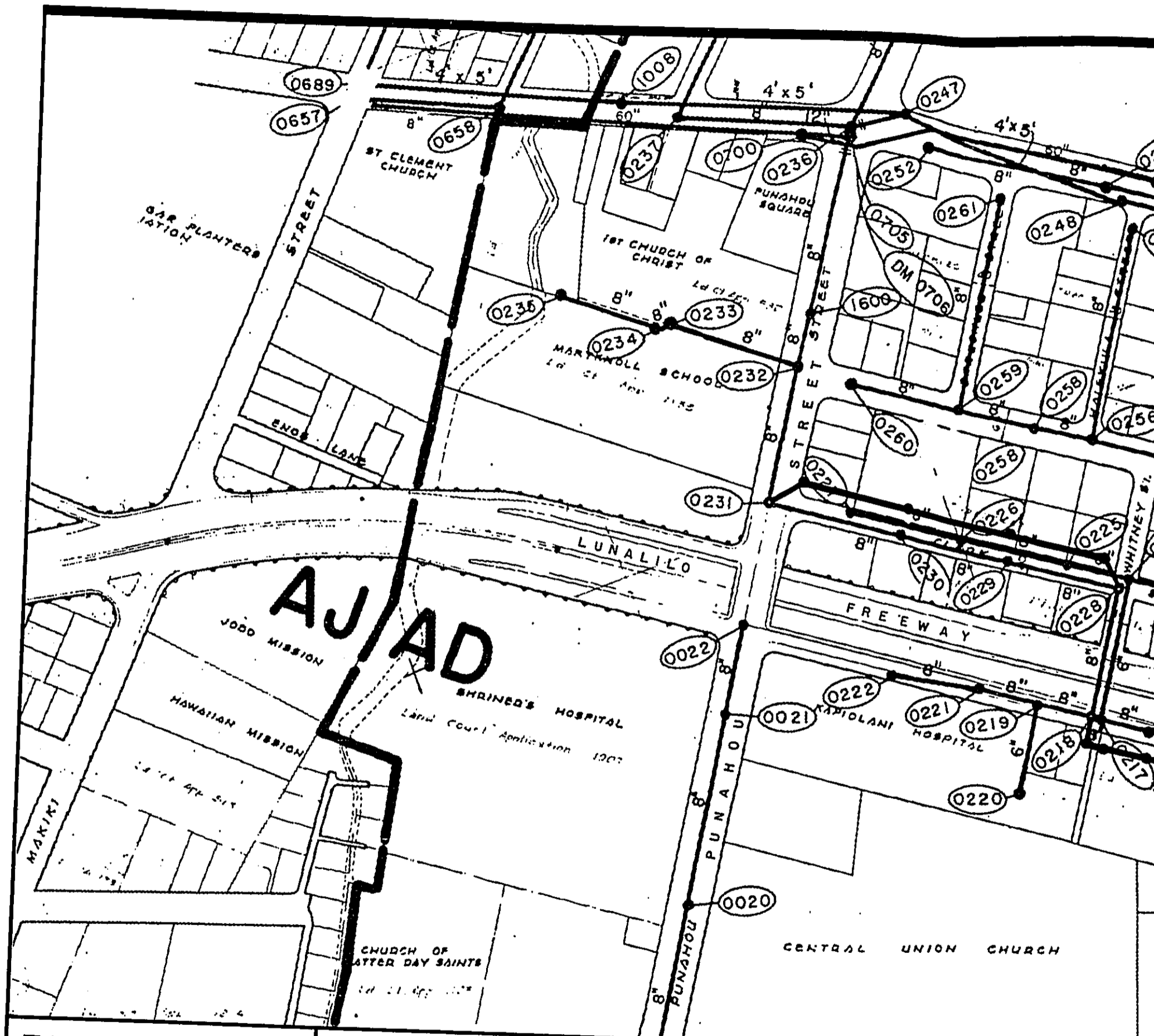
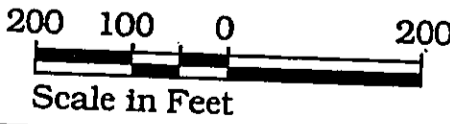


Figure A-35
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



North

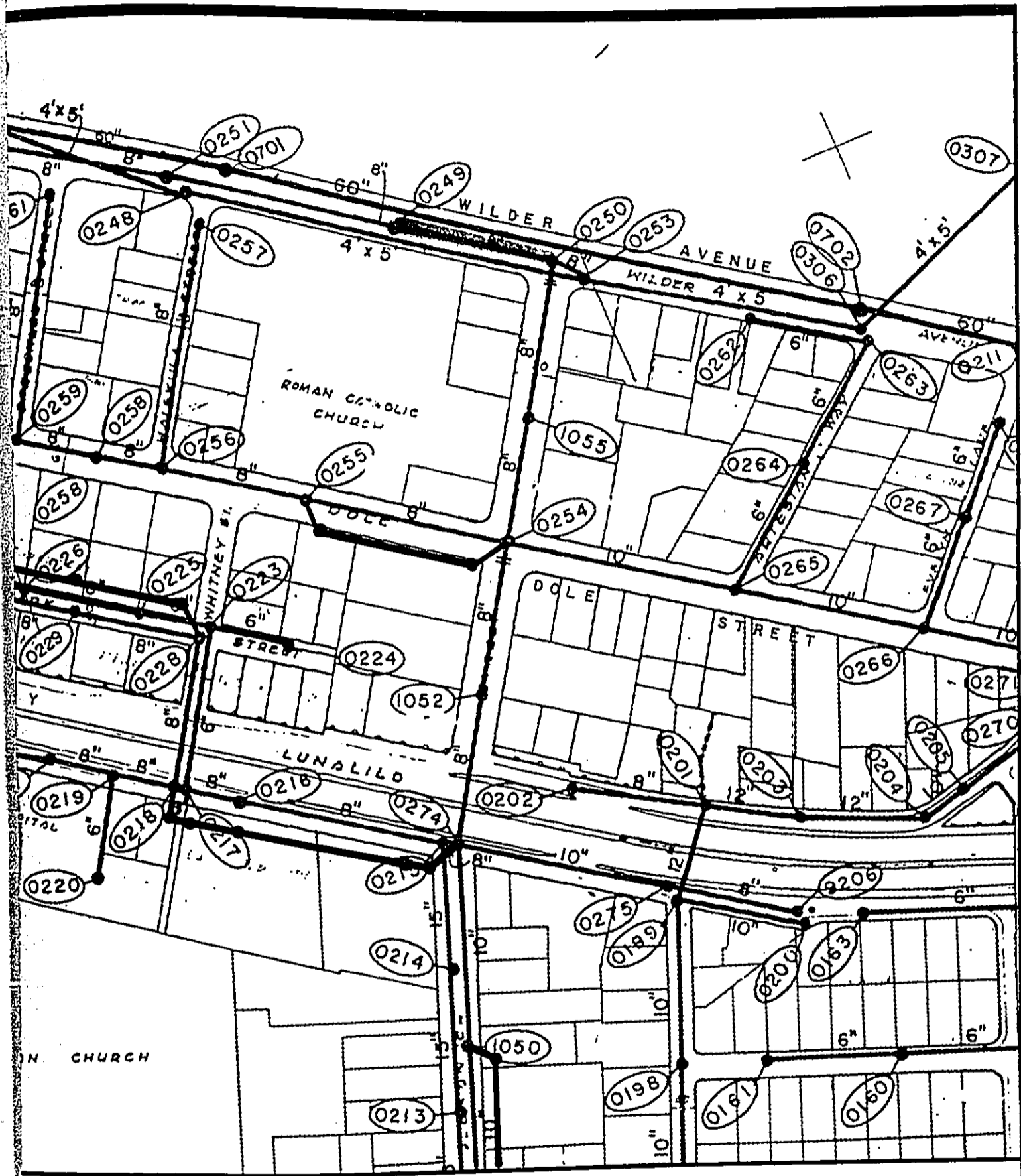
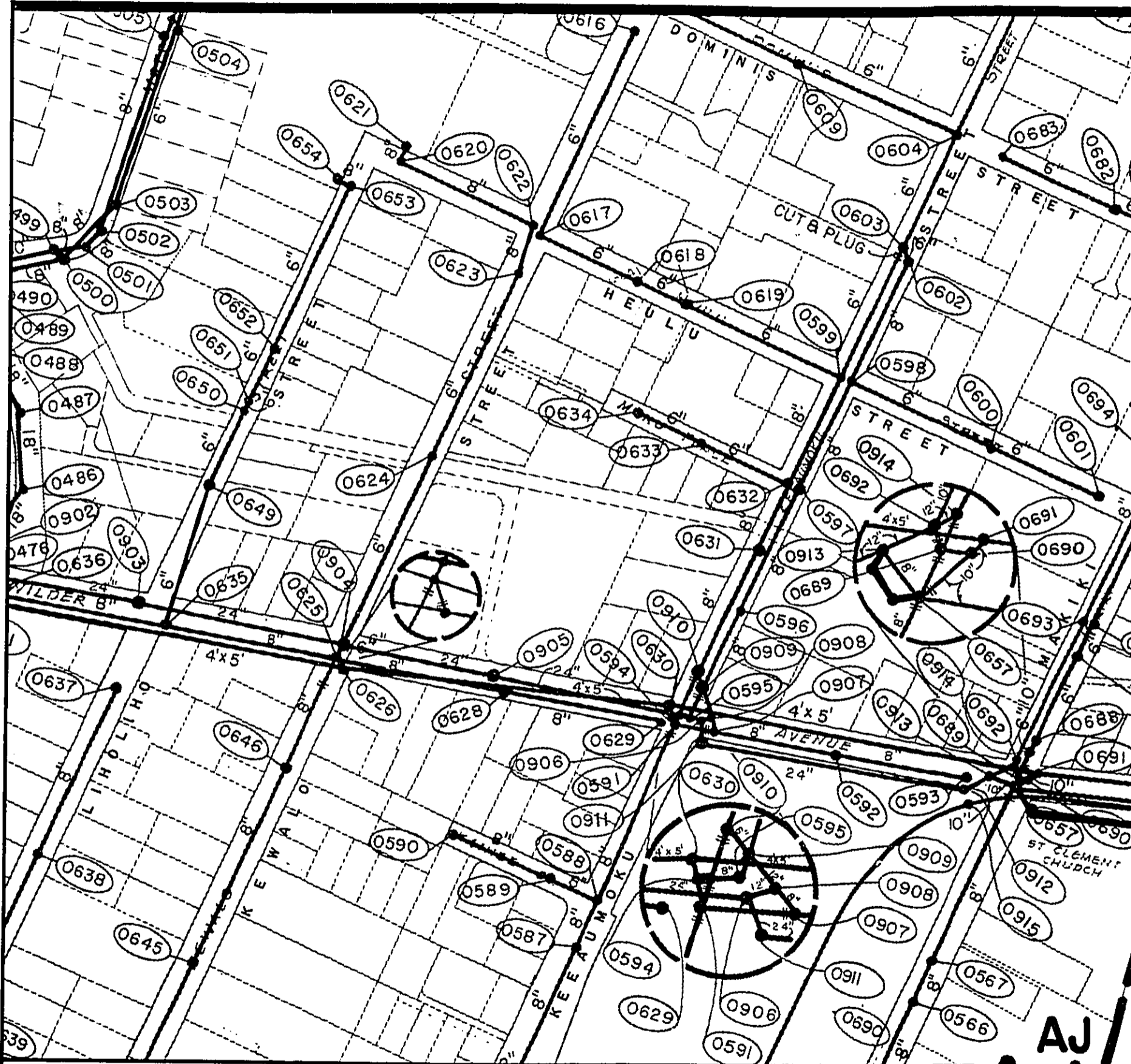
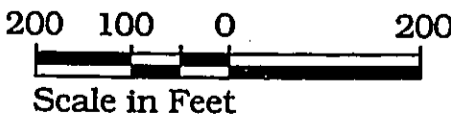


Figure A-36
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



AJ

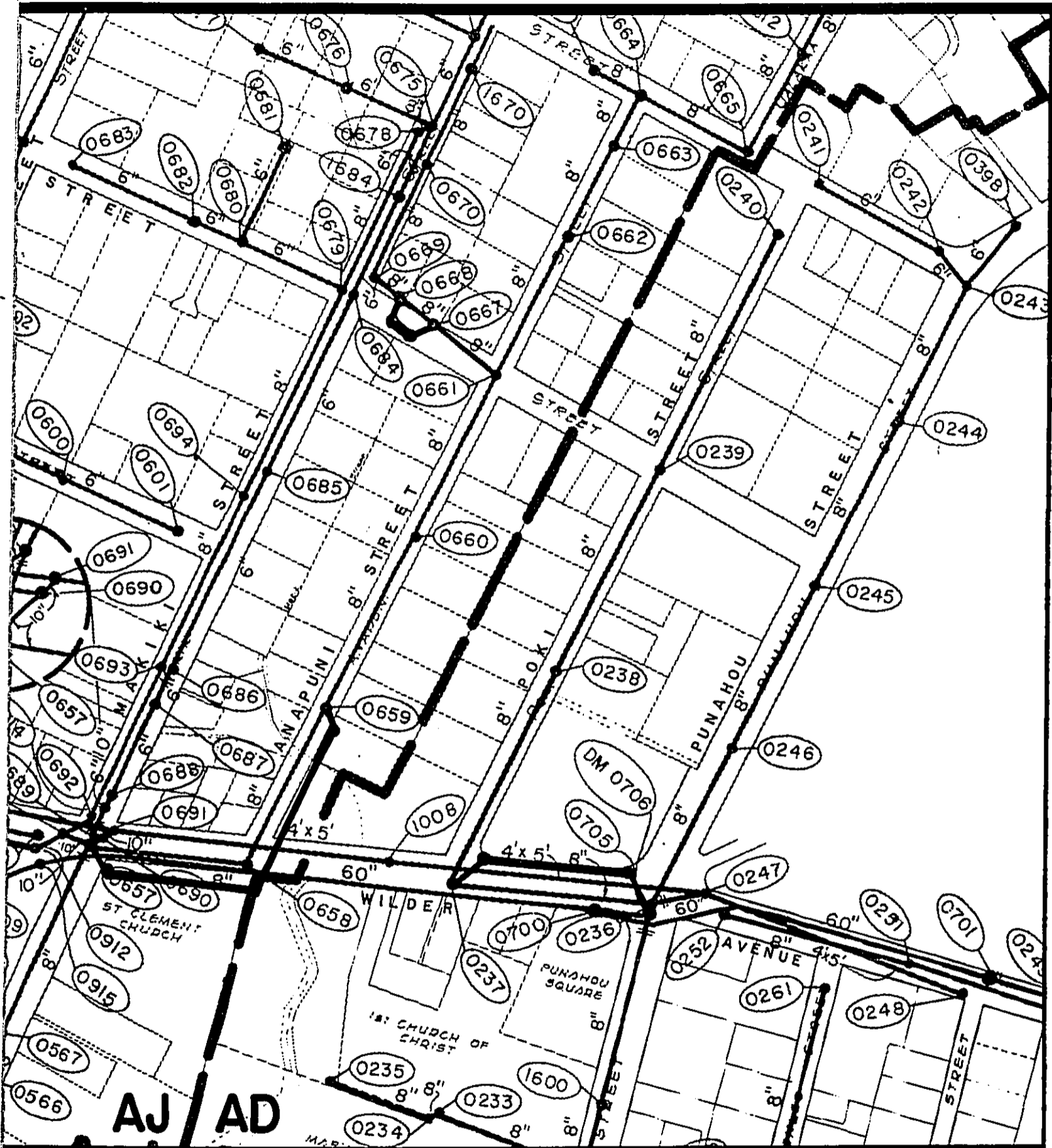
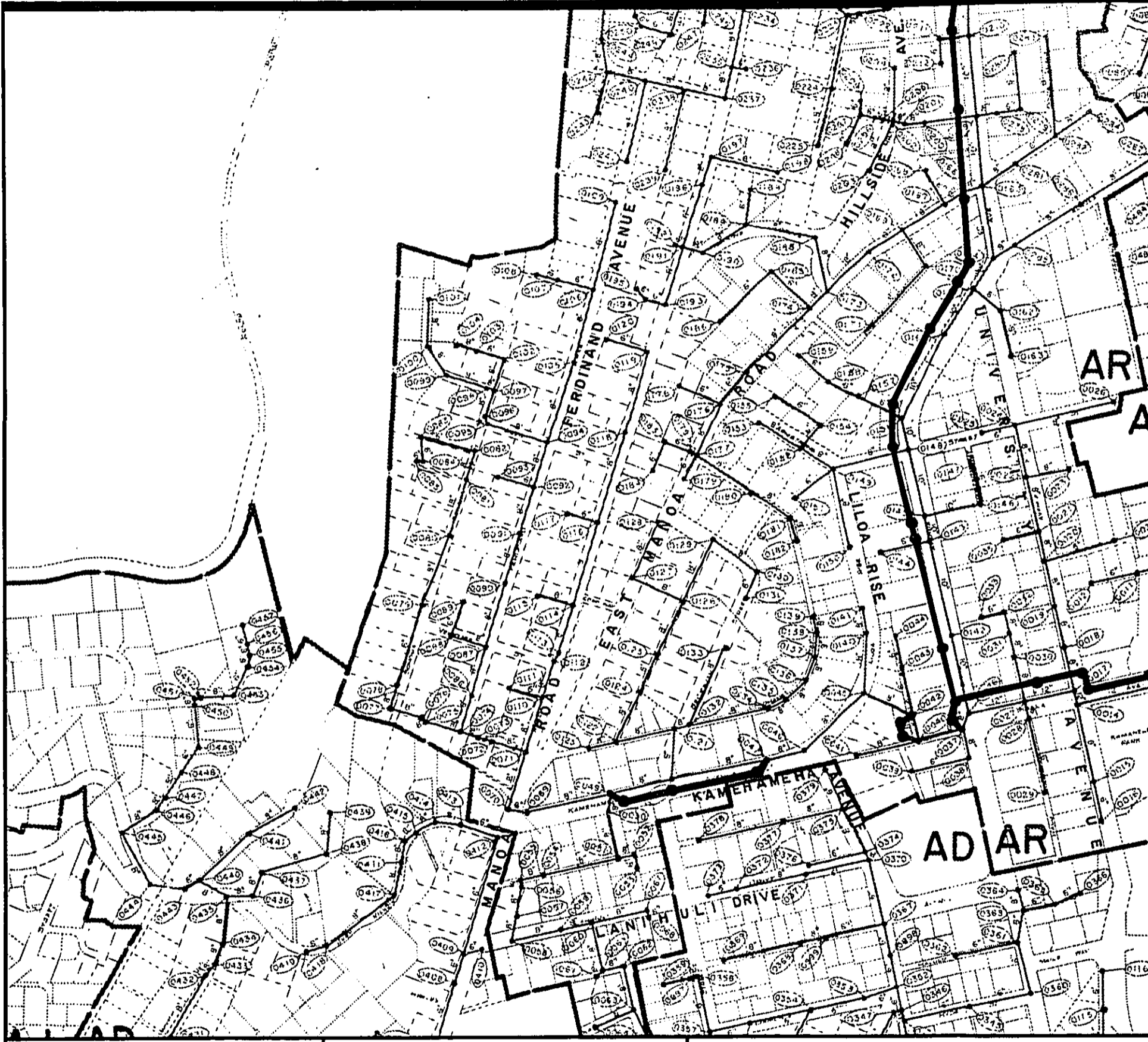
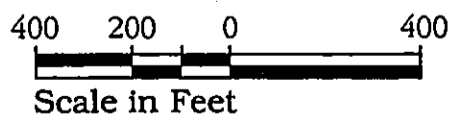


Figure A-37
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



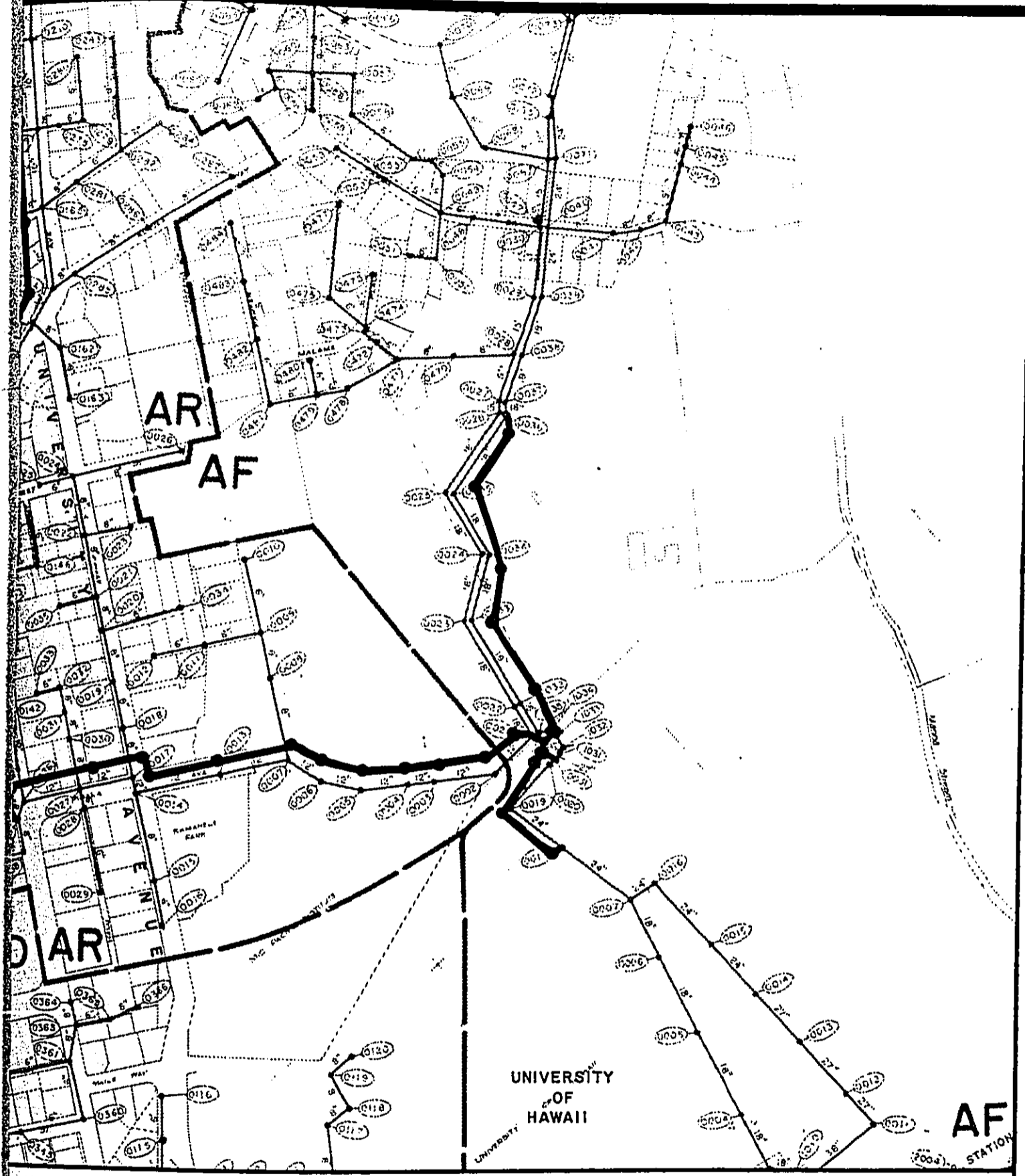
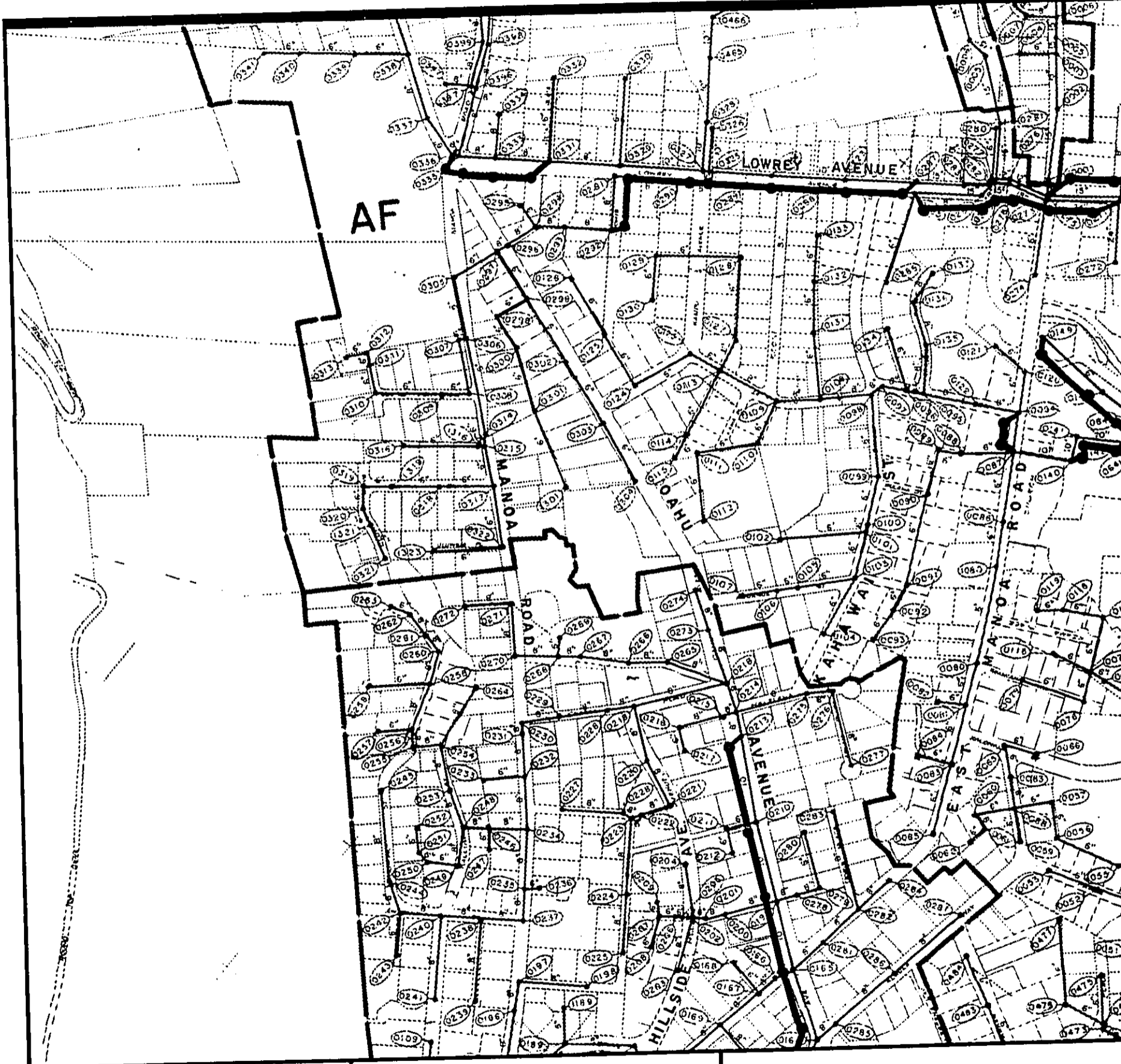
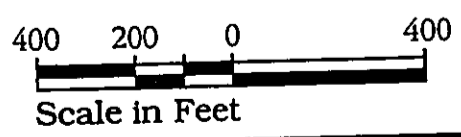


Figure A-38
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



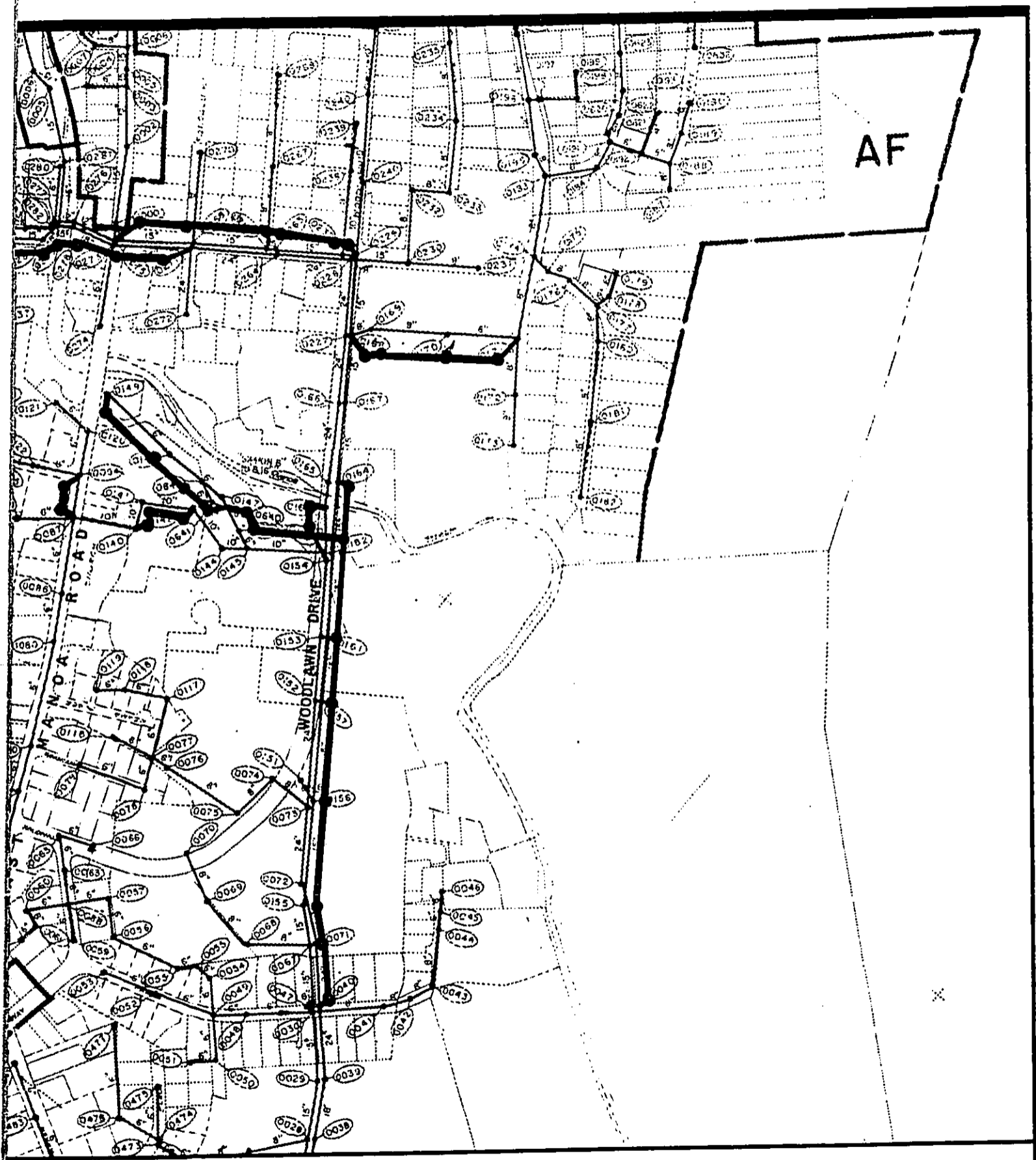
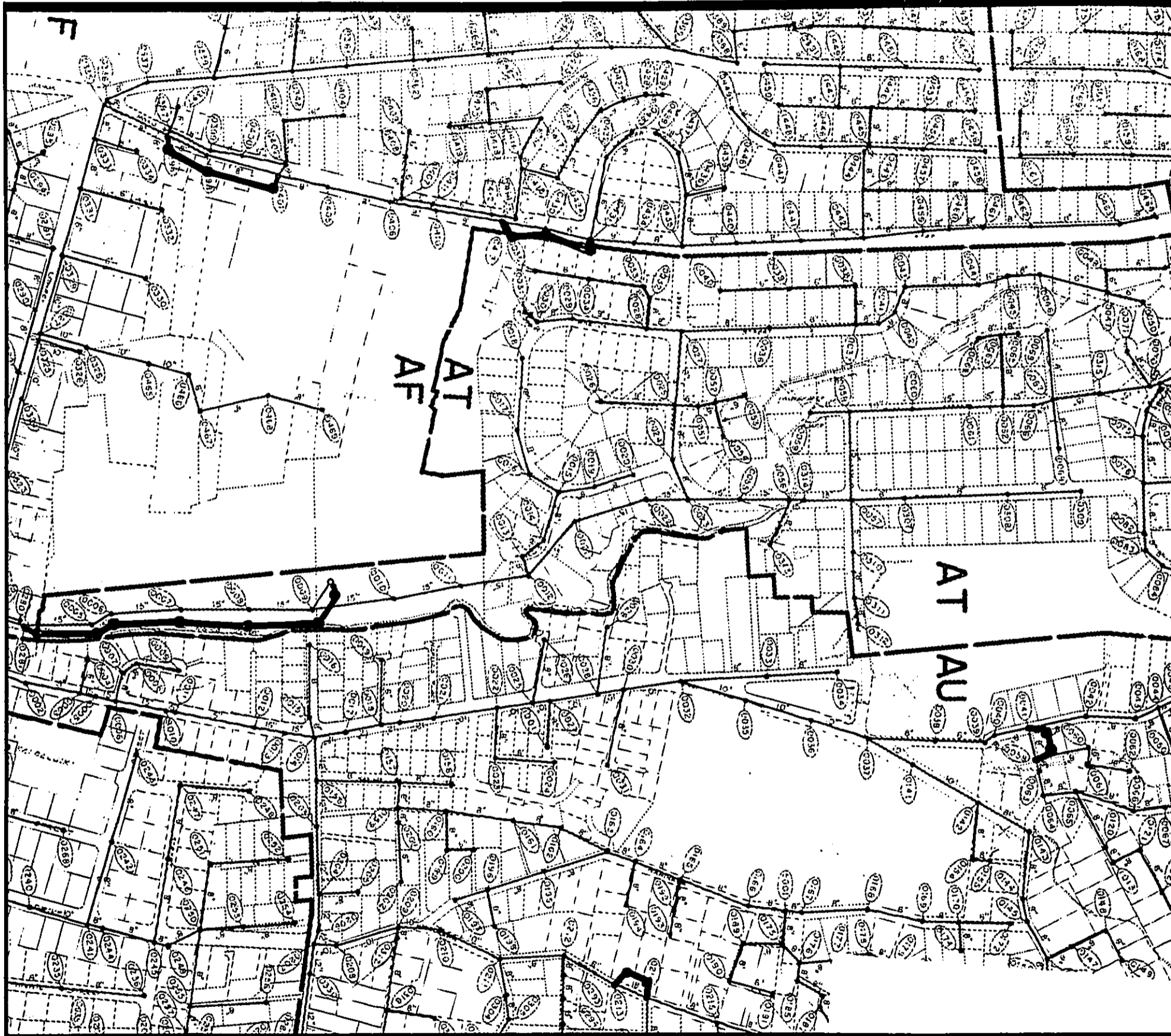
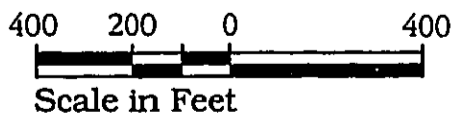


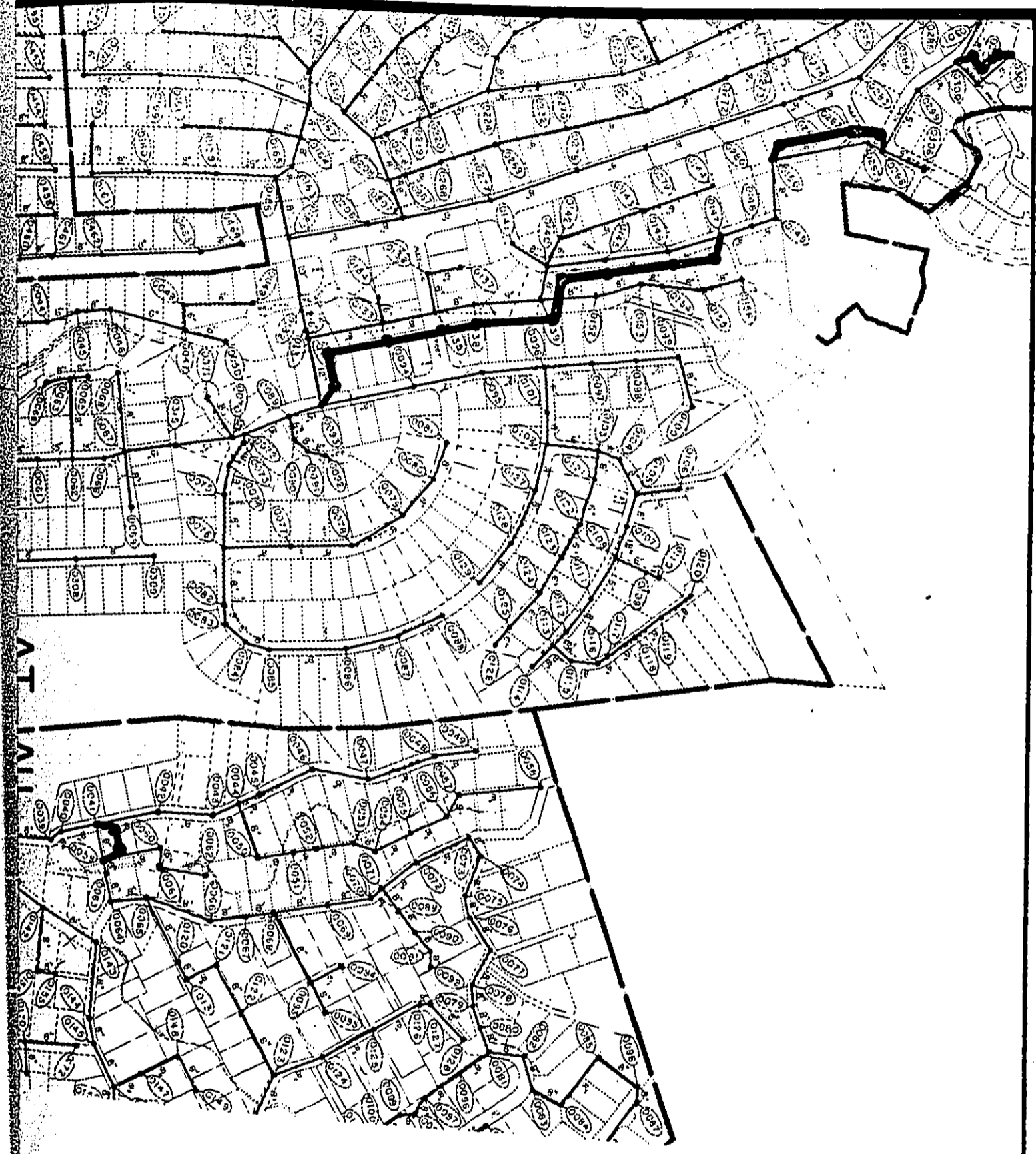
Figure A-39
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993

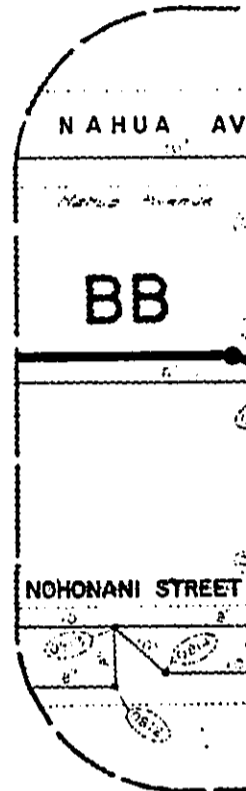
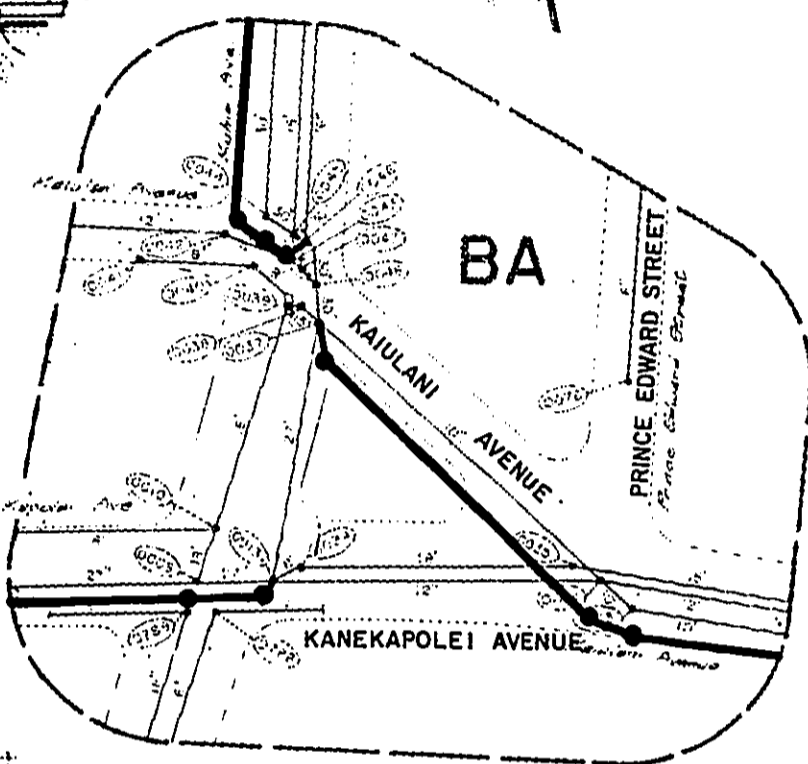
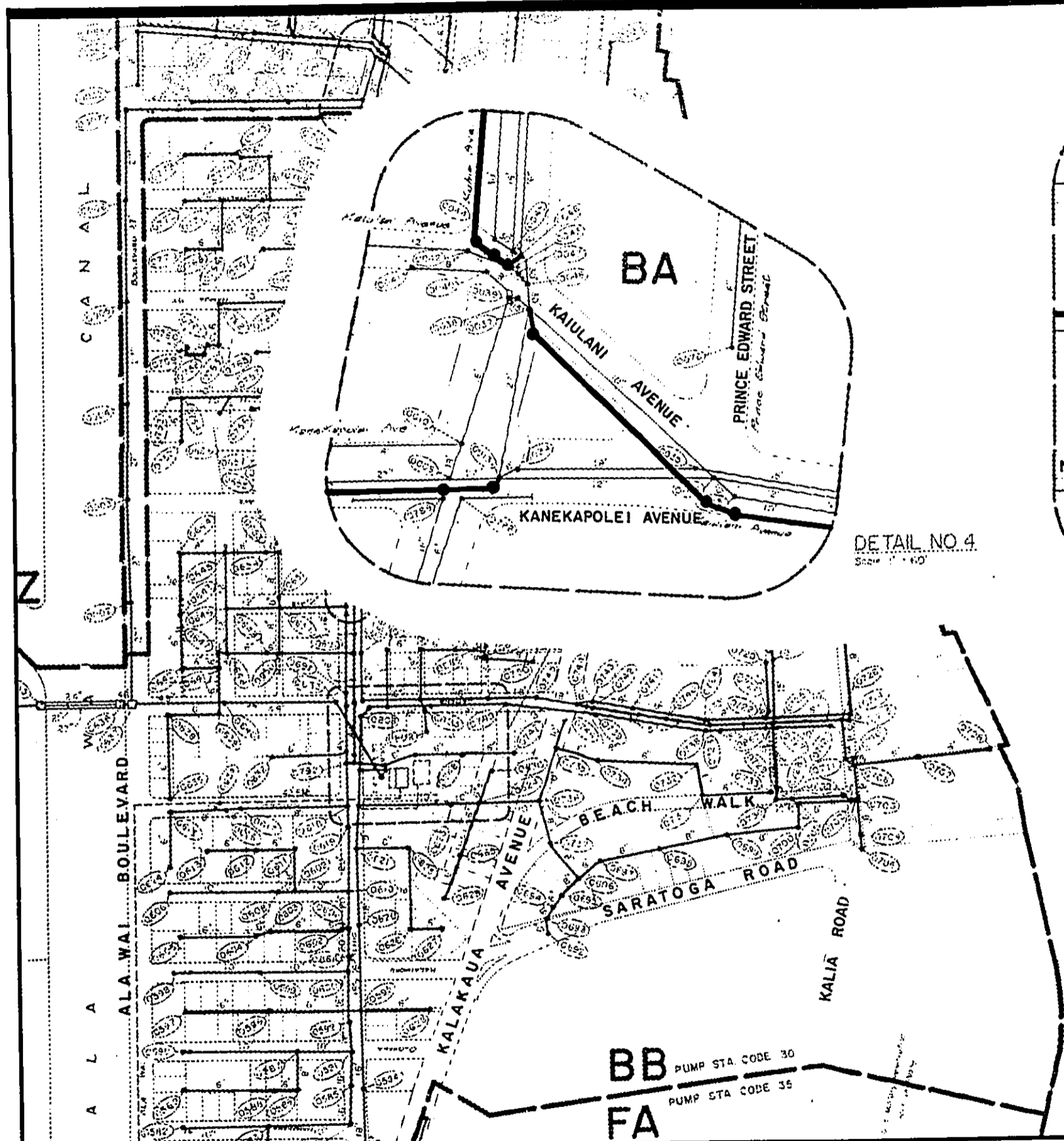


North

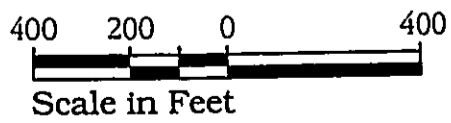


PLANS

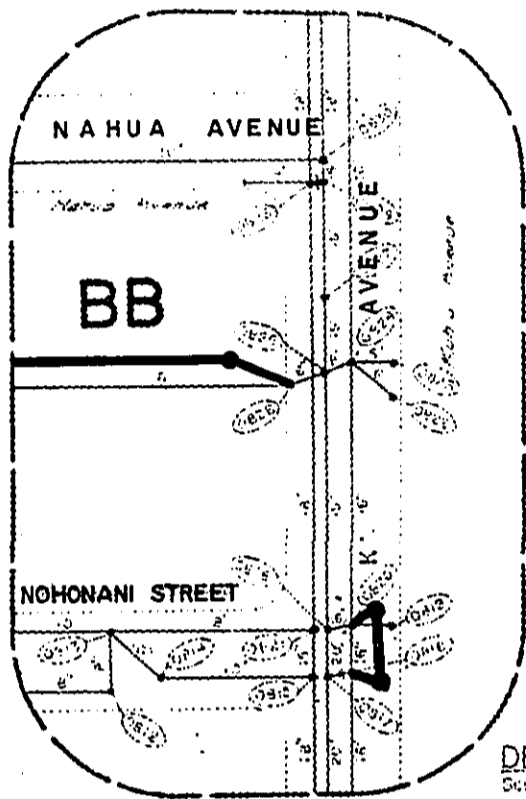
Figure A-40
Relief Sewers



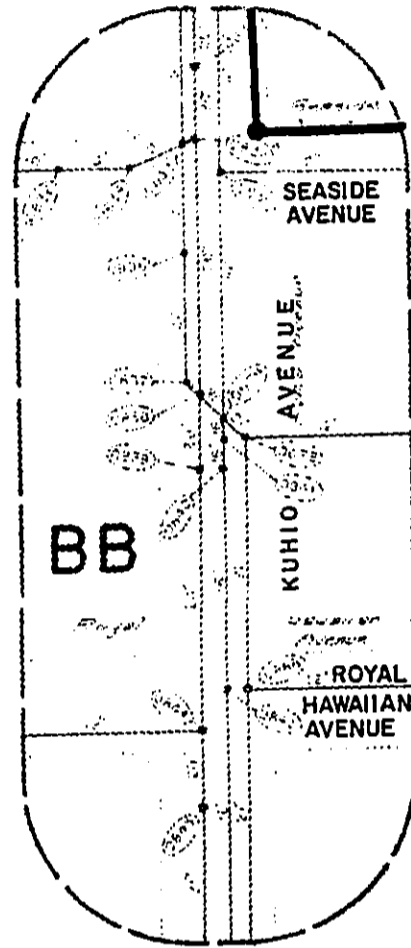
EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



BB PUMP STA. CODE 30
FA PUMP STA. CODE 35

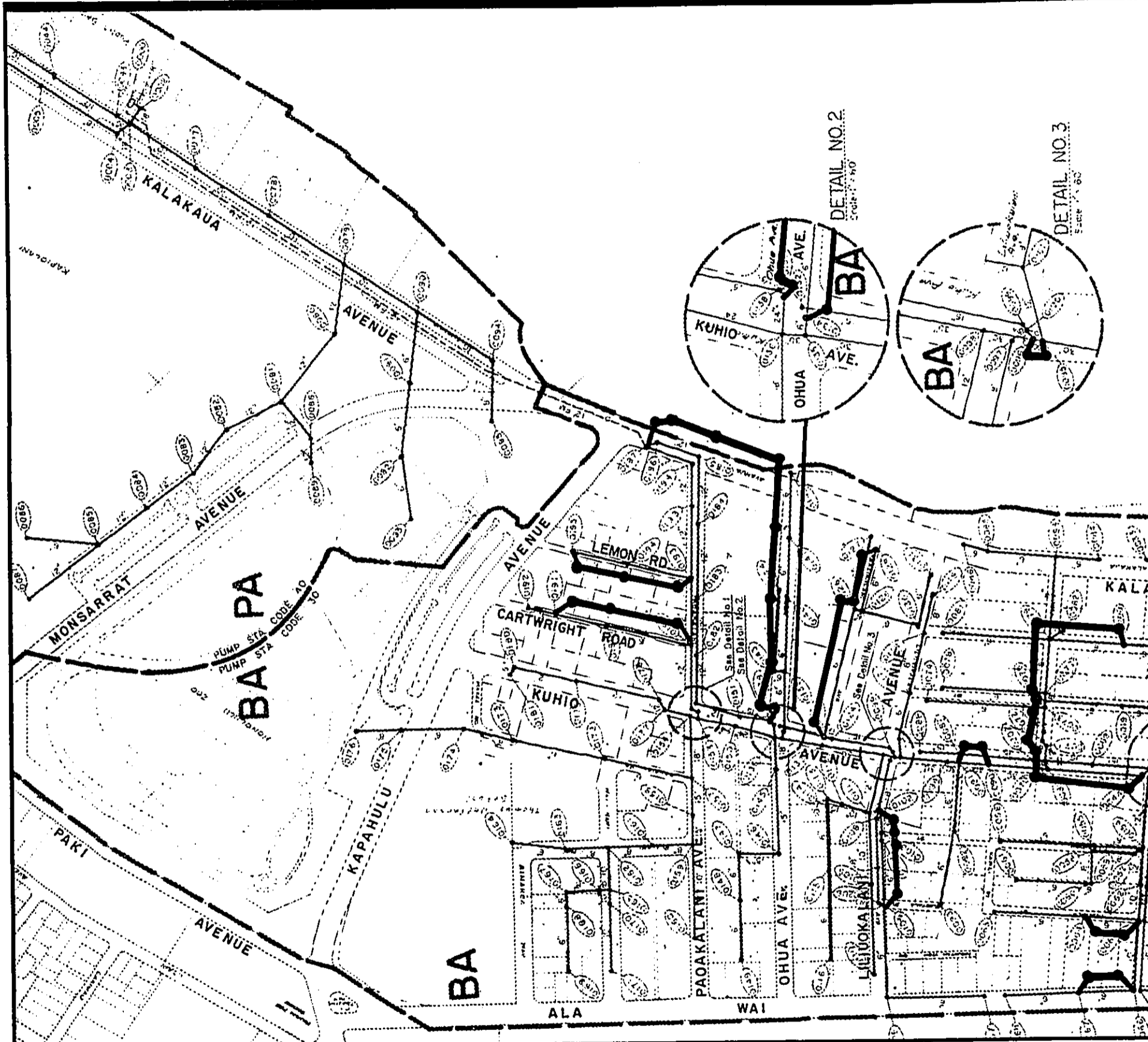


DETAIL NO. 5
Scale: 1" = 60'

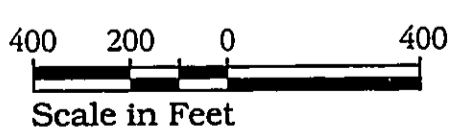


DETAIL NO. 6
Scale: 1" = 60'

Figure A-41
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



DETAIL NO. 3
Sheet 1 of 100

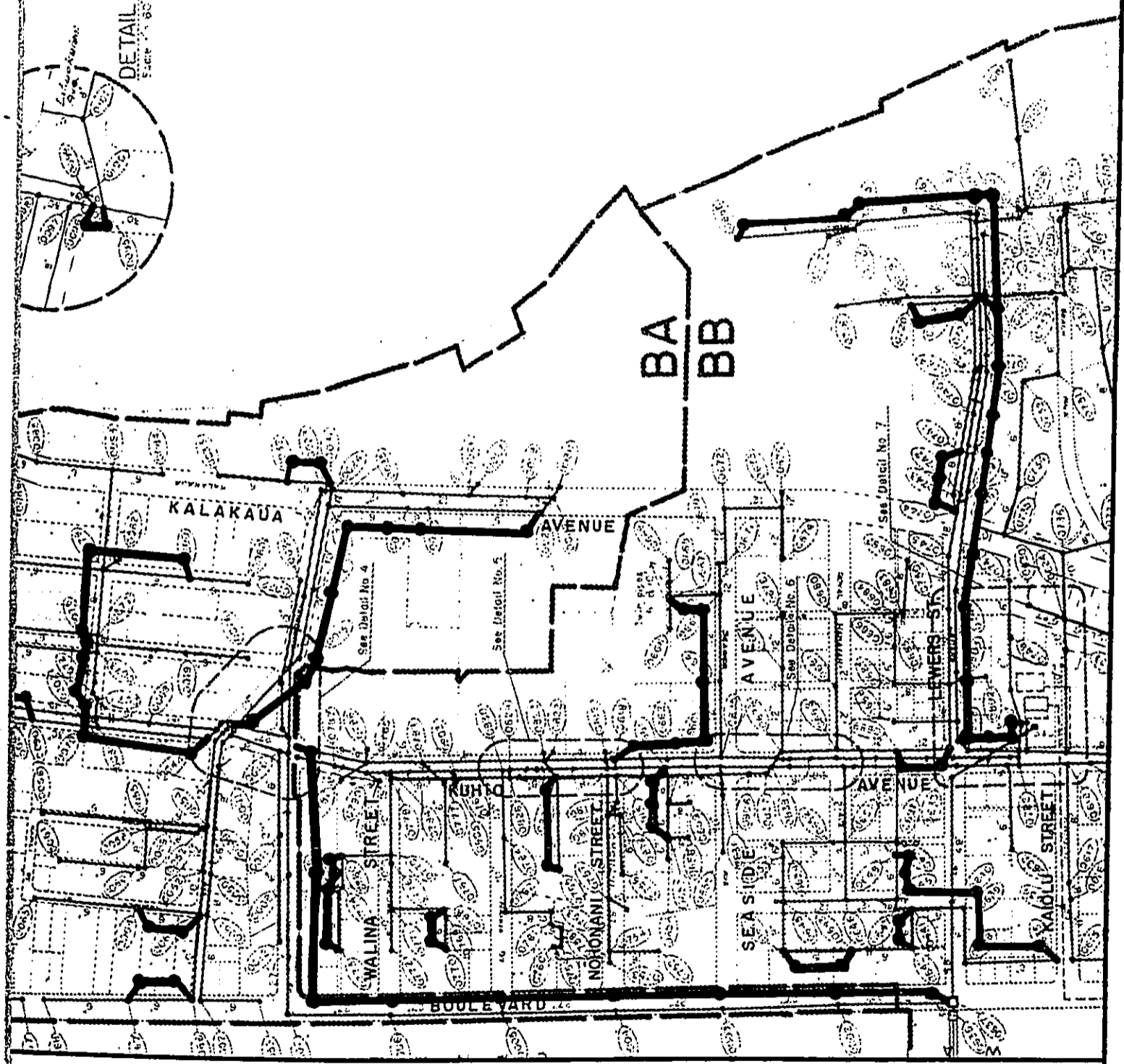
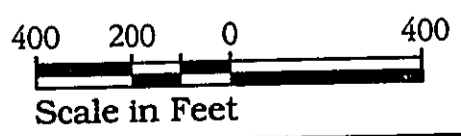


Figure A-42
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



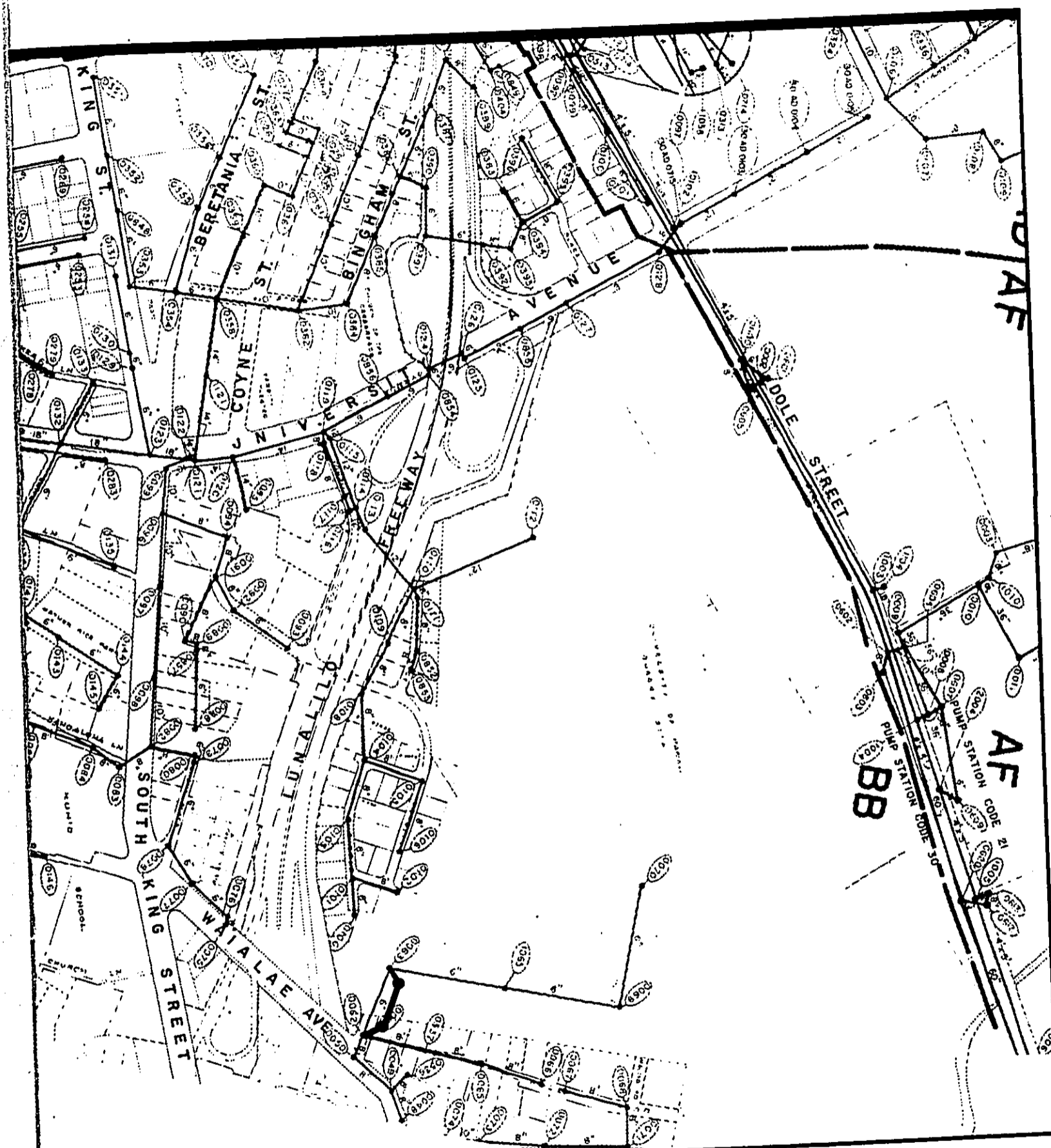
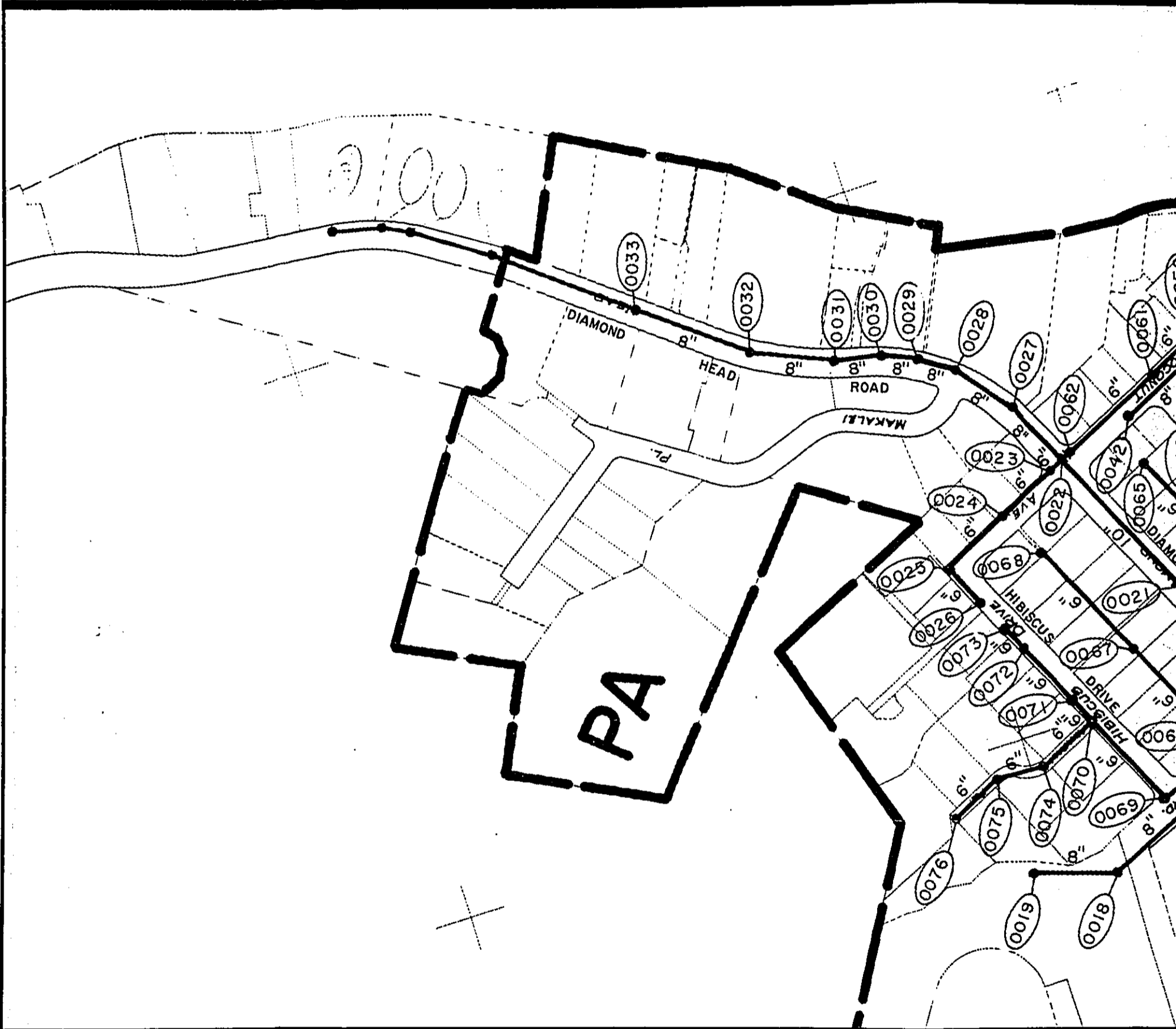


Figure A-43
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993

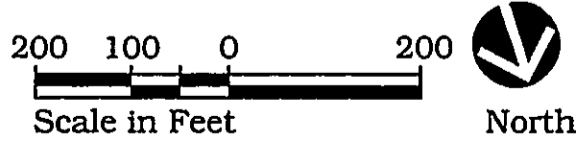
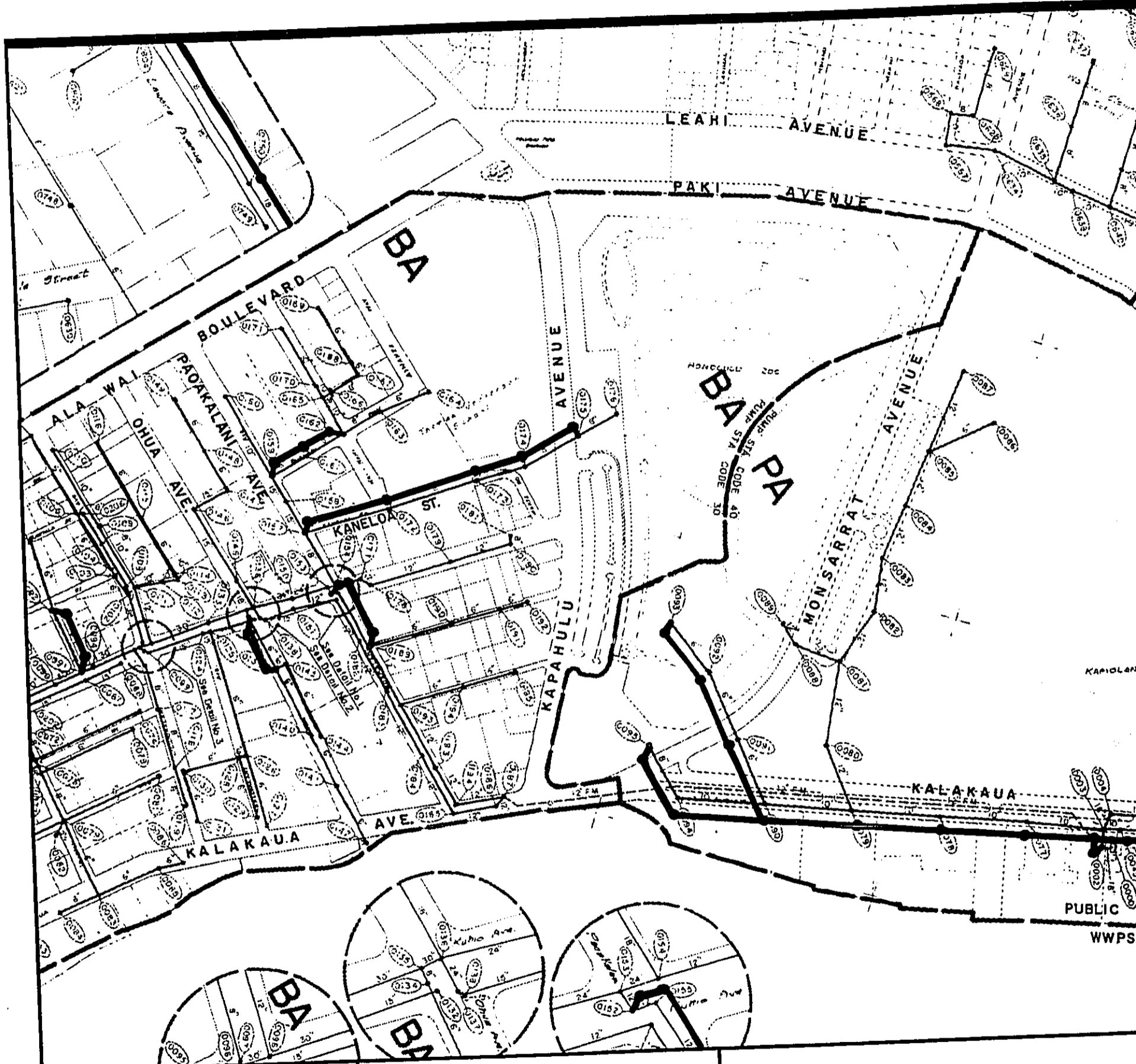


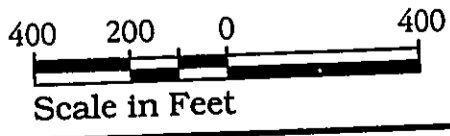


Figure A-44
Relief Sewers

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



North

PUBLIC
 WWPS

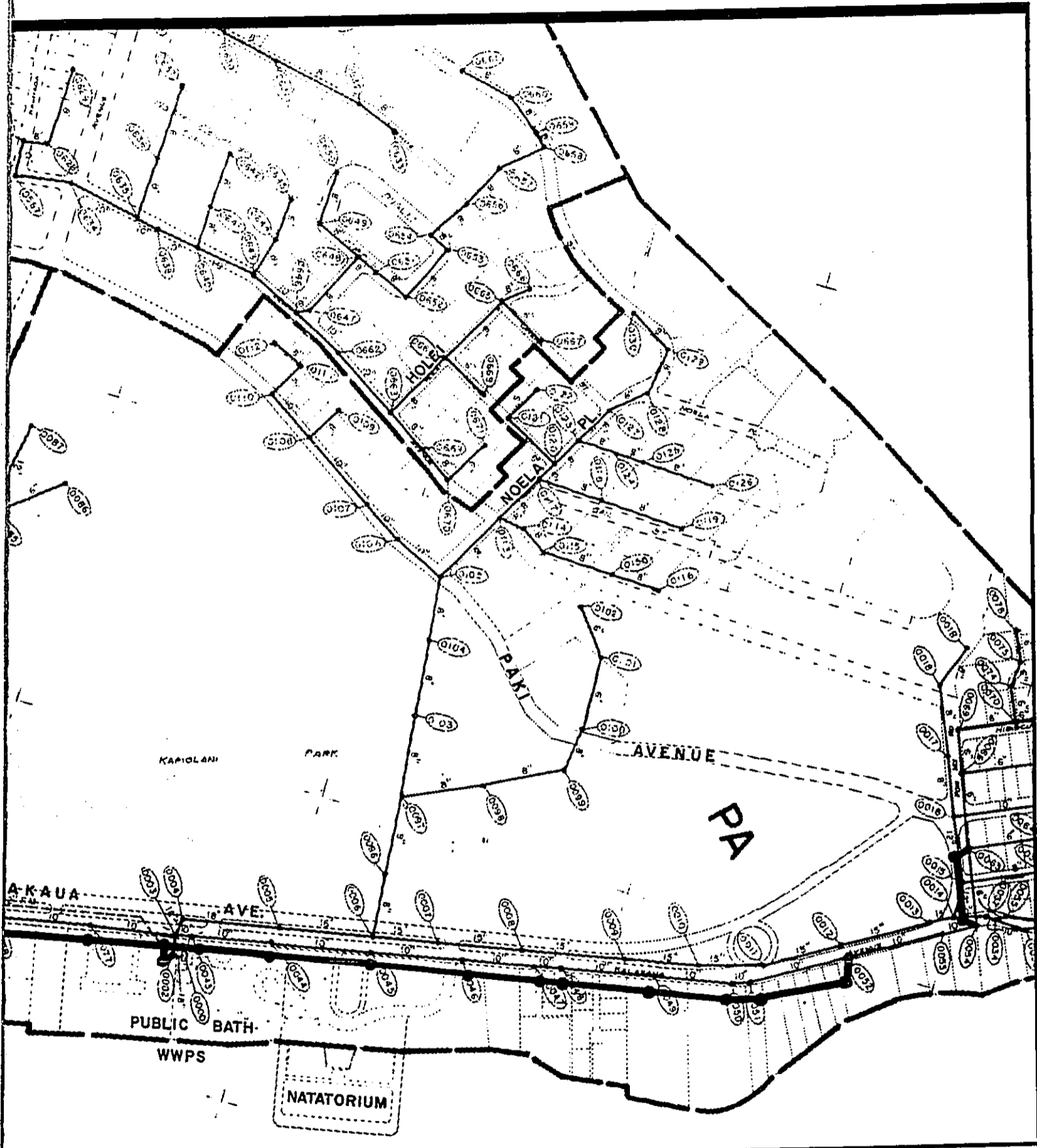
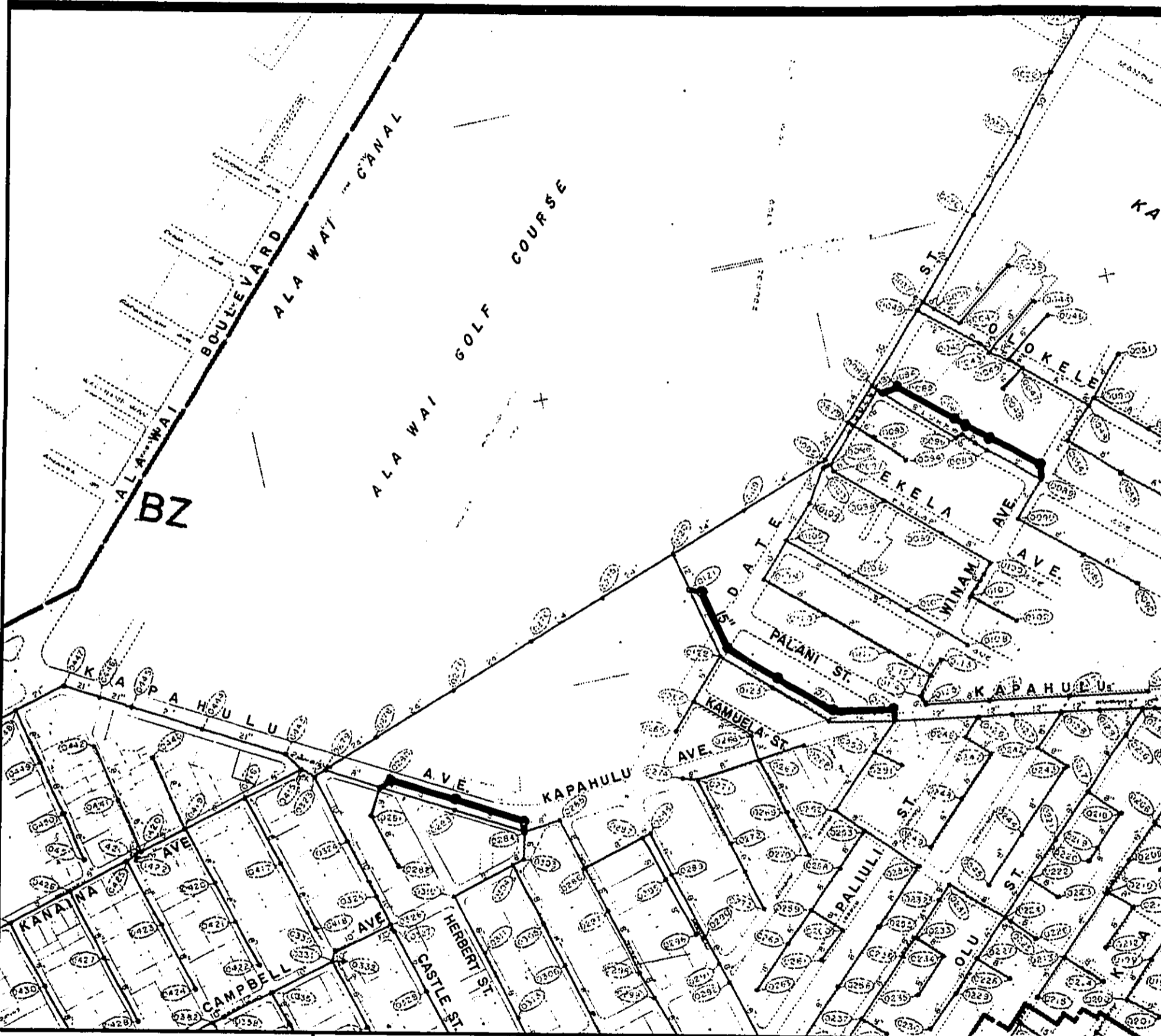
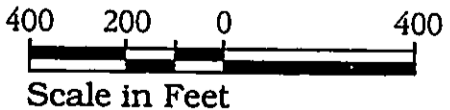


Figure A-45
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



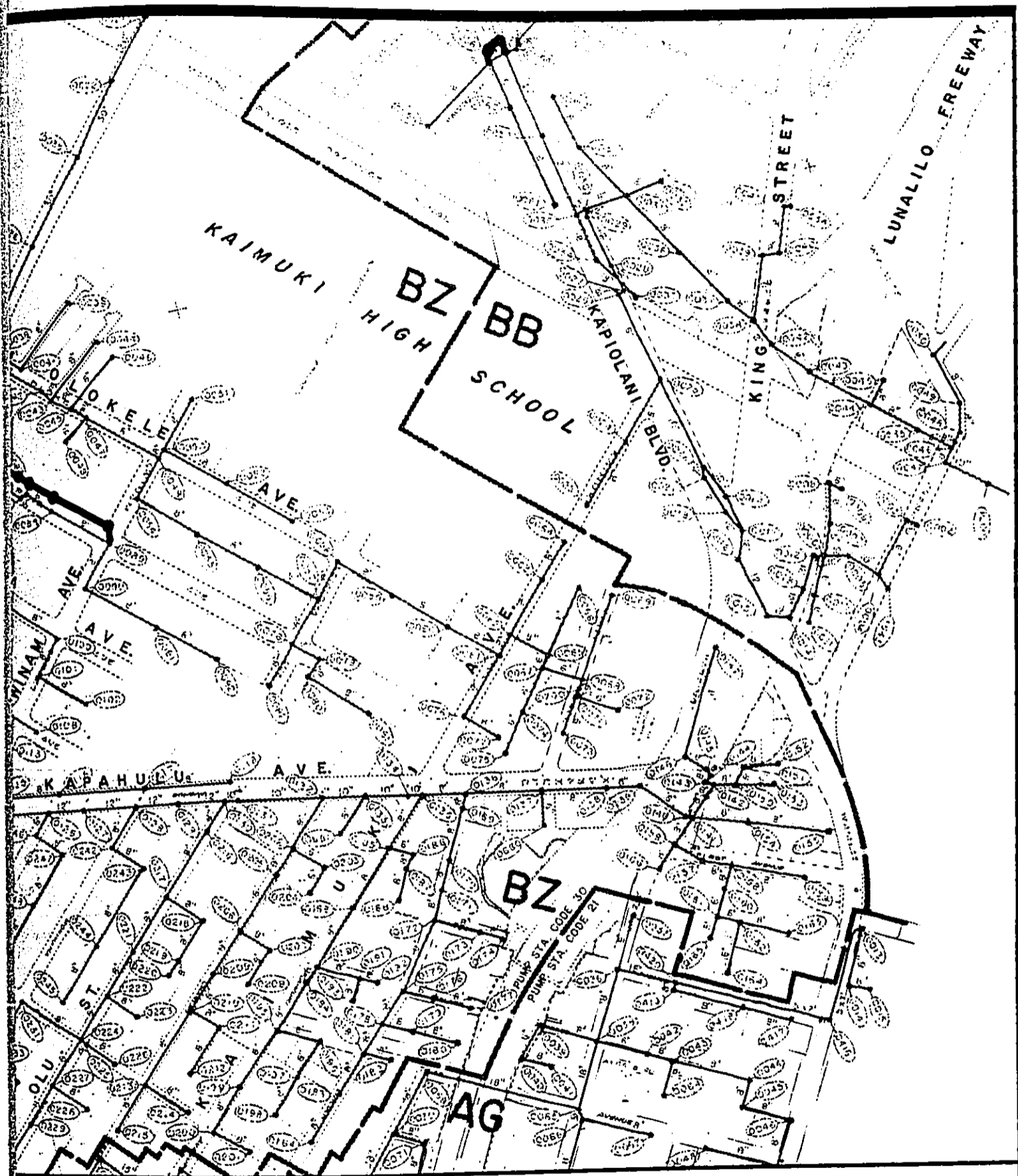
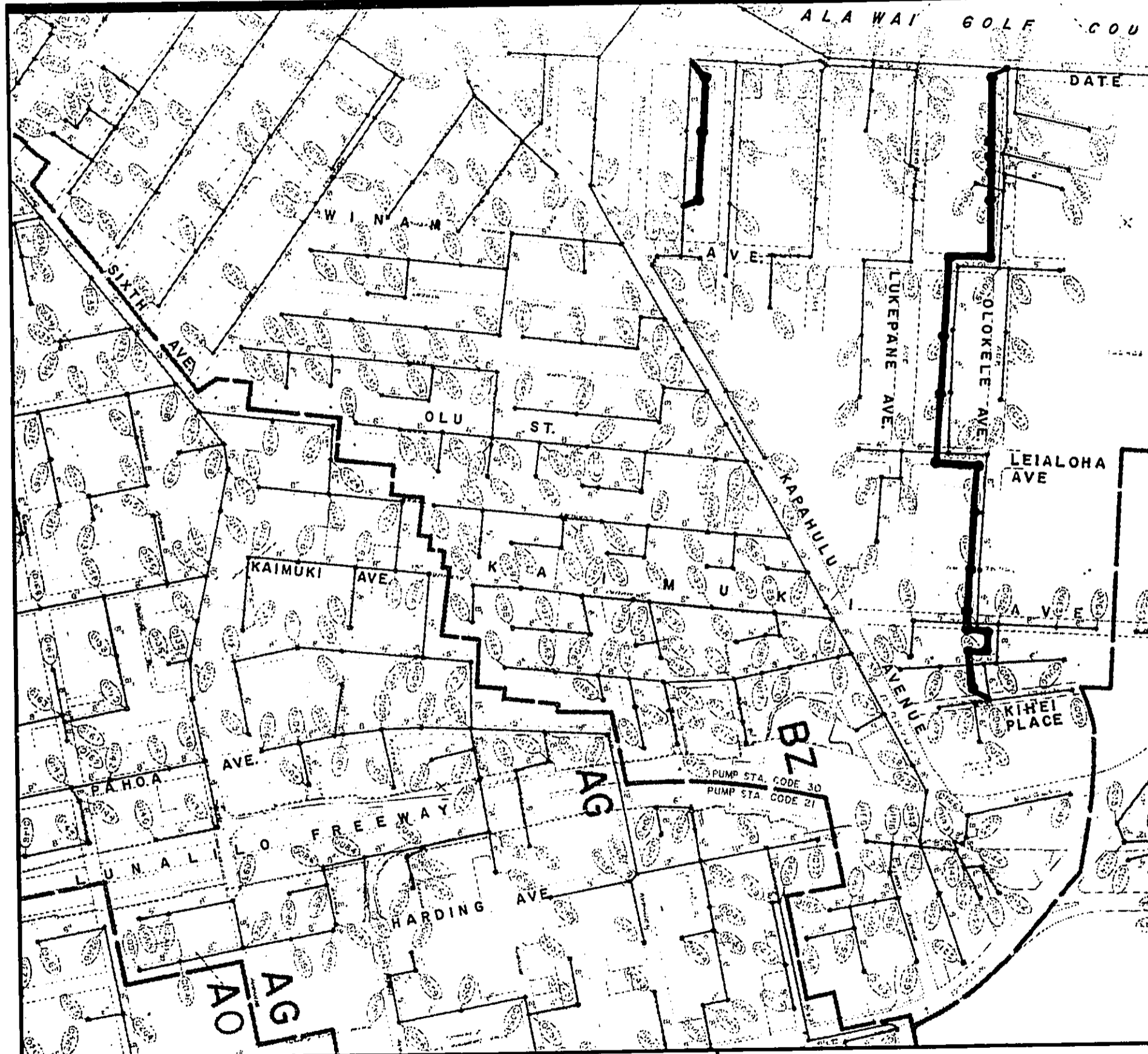
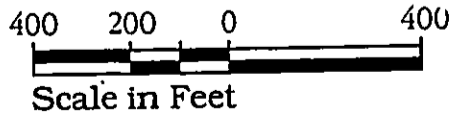


Figure A-46
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



ALA WAI GOLF COURSE

DATE

BZ

AG

AO
 AG

PUMP STA. CODE 30
 PUMP STA. CODE 21

LEIALOHA AVE

KIHEI PLACE

SIXTH AVE

WINA...M

OLU ST.

KAIMUKI AVE

KAIMUKI AVE

PAHOA

AVE.

LUNALI'LO

FREEWAY

HARDING AVE

LUKEPANE AVE

OLOKELE AVE

KAPAHULU

AVENUE

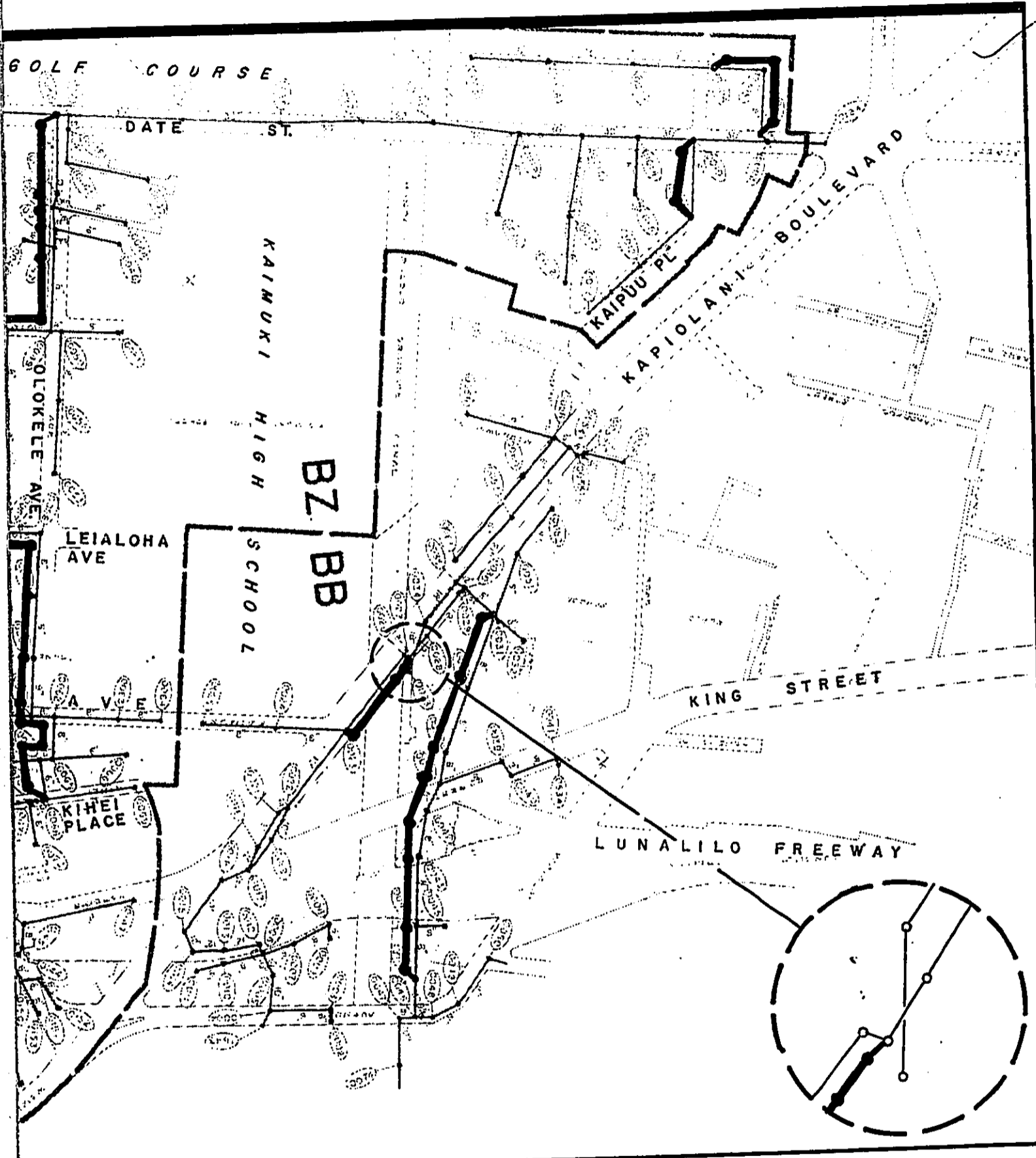
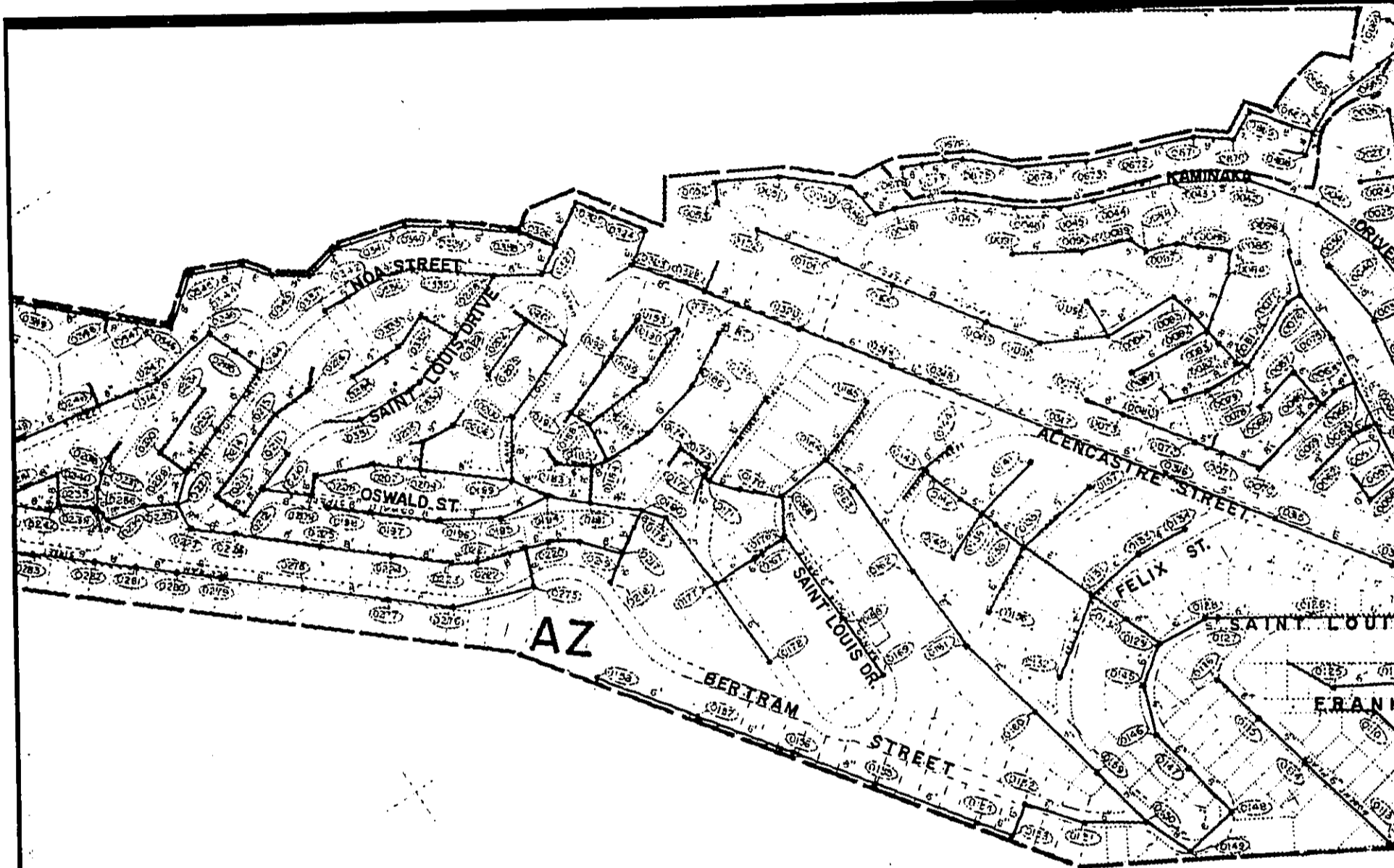
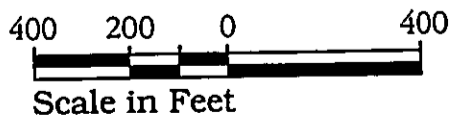


Figure A-47
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



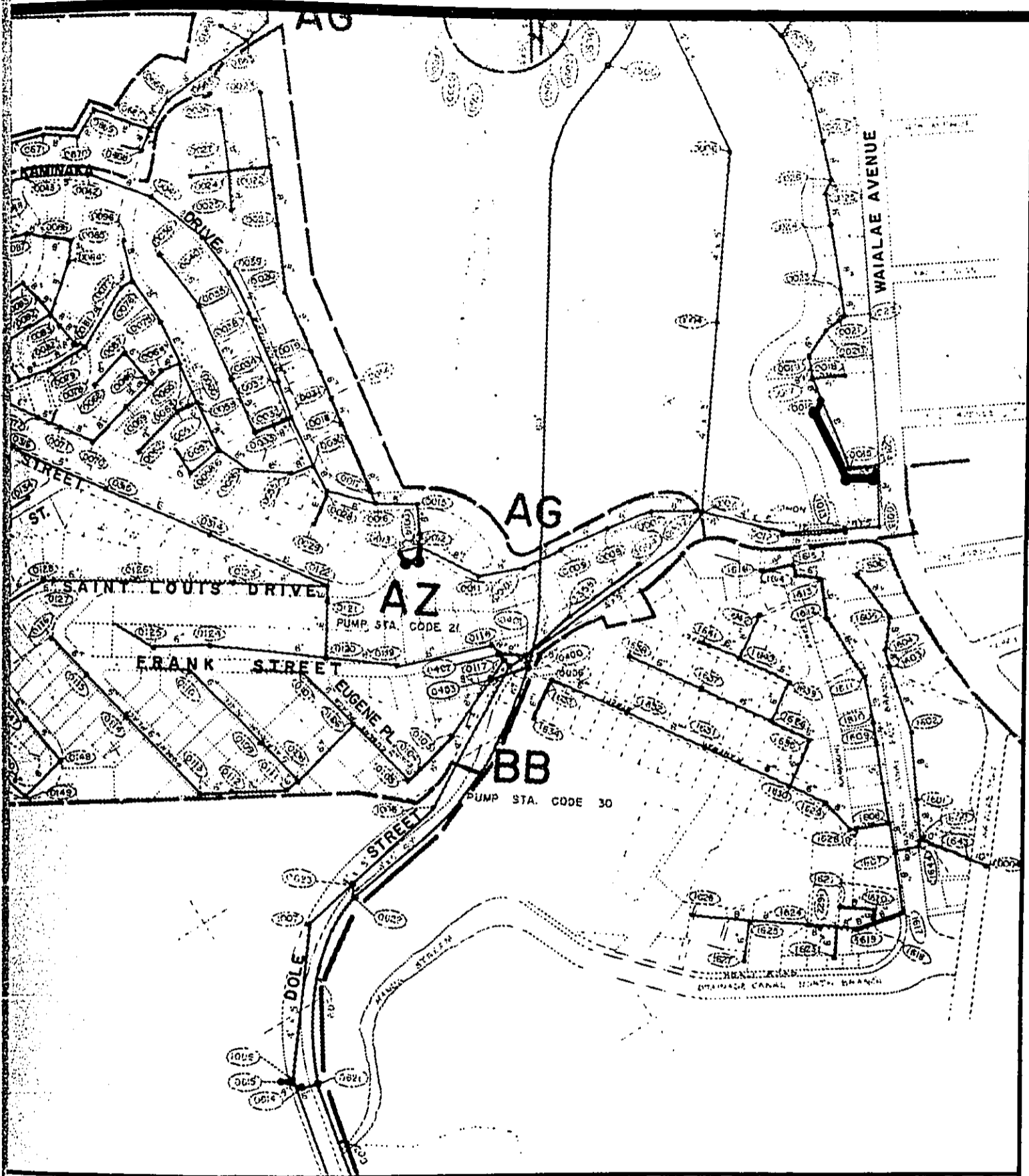
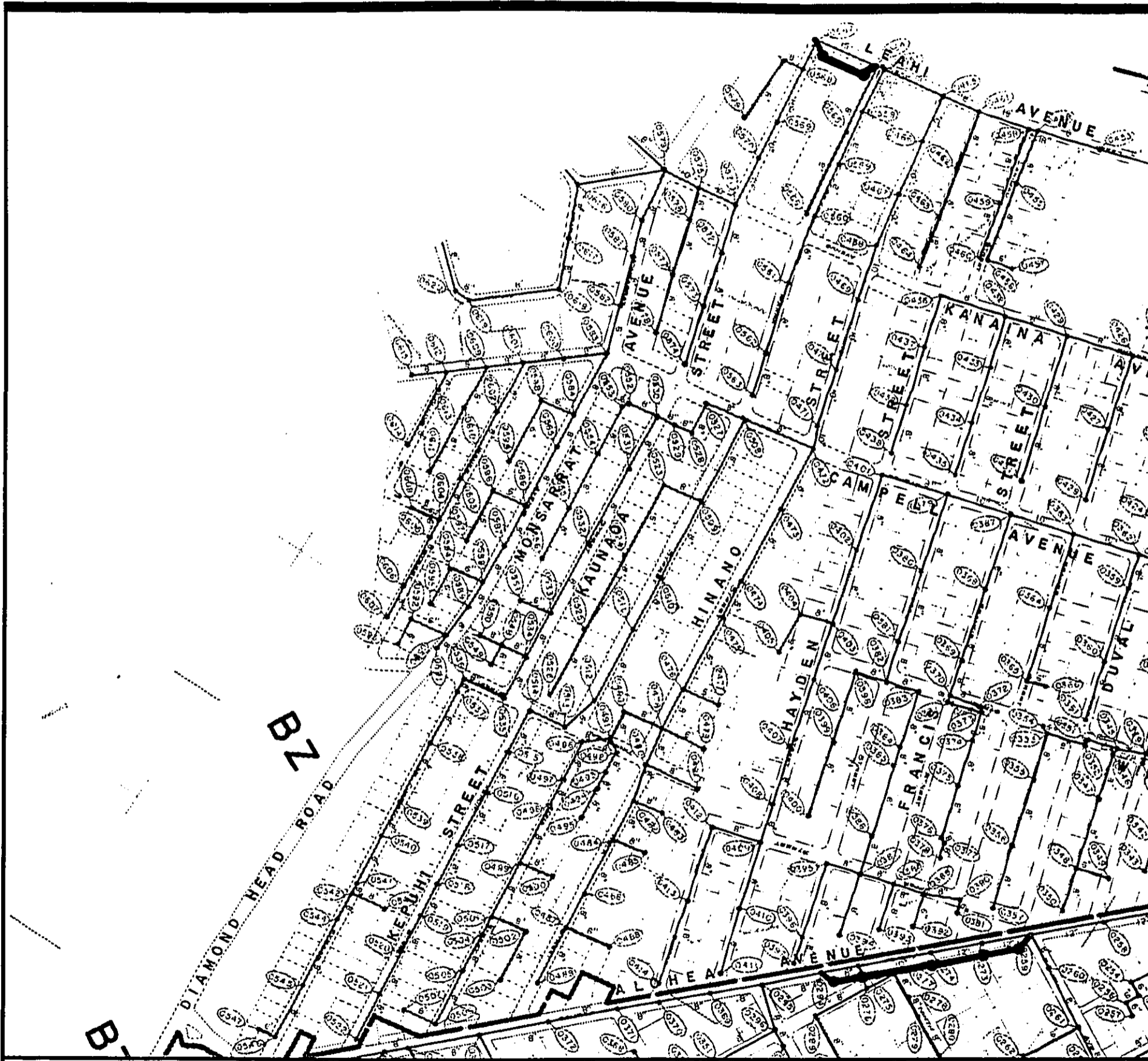


Figure A-48
Relief Sewers



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT

BELT COLLINS HAWAII • DECEMBER 1993

400 200 0 400



Scale in Feet



North

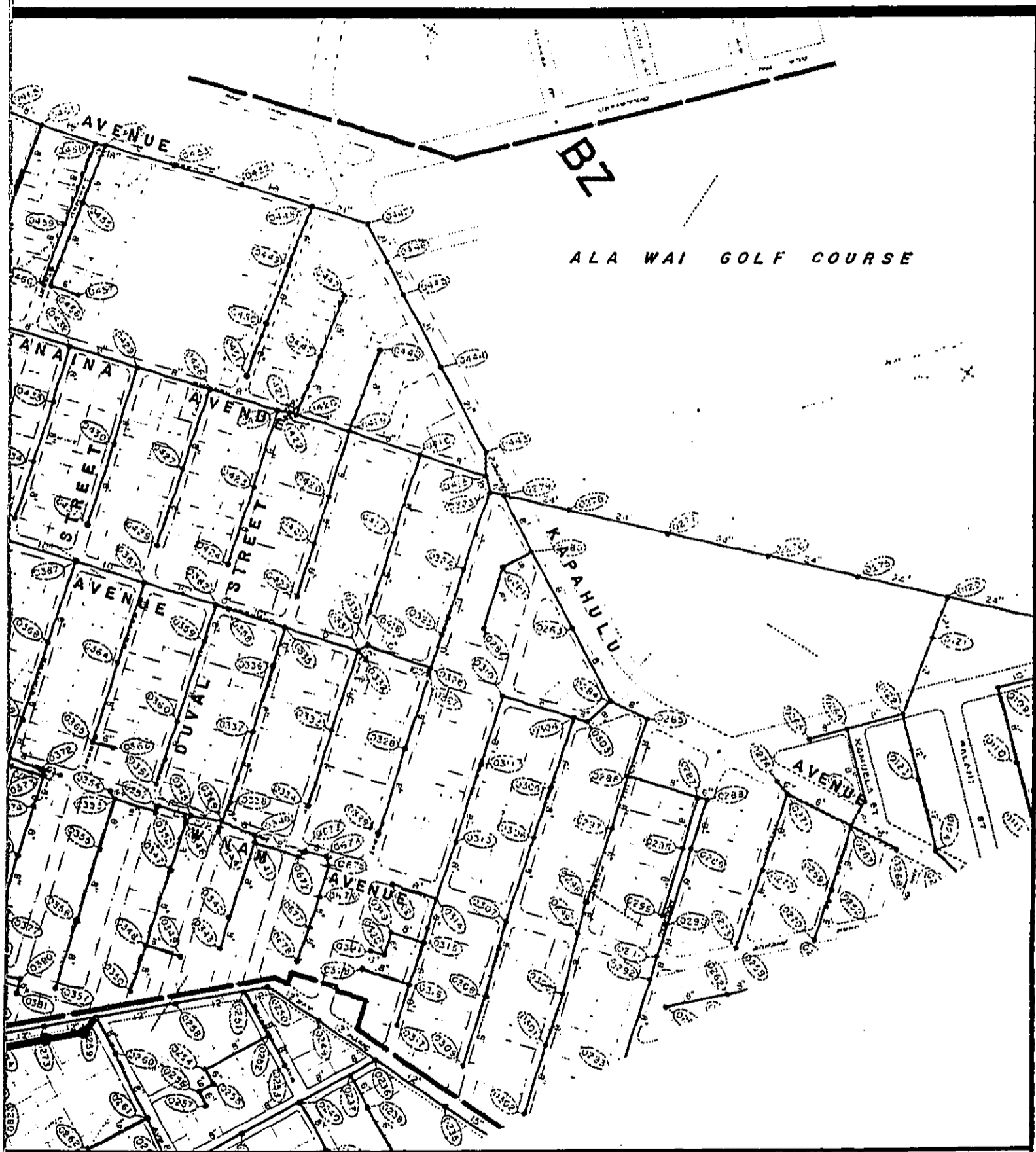
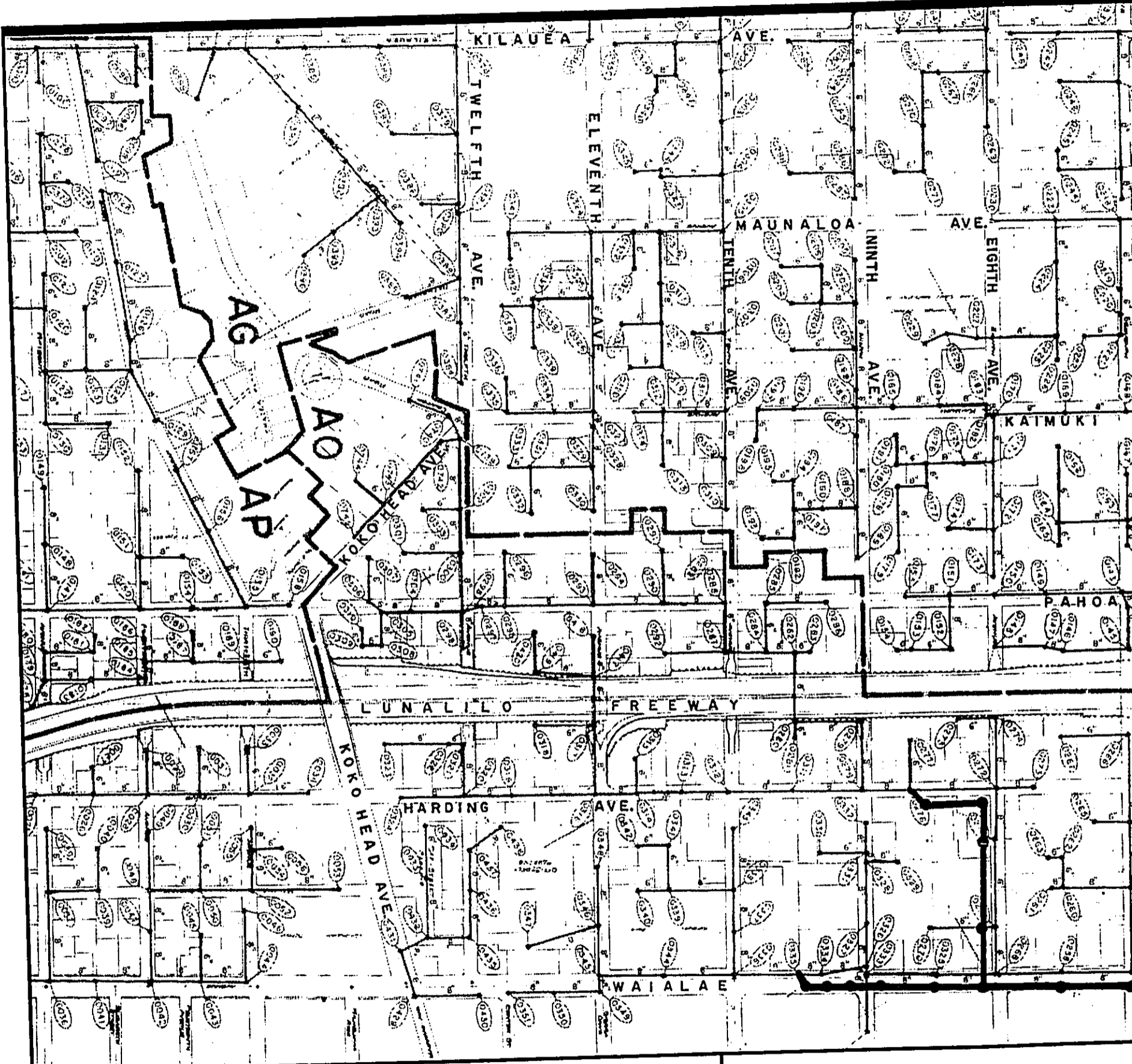
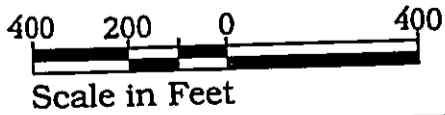


Figure A-49
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



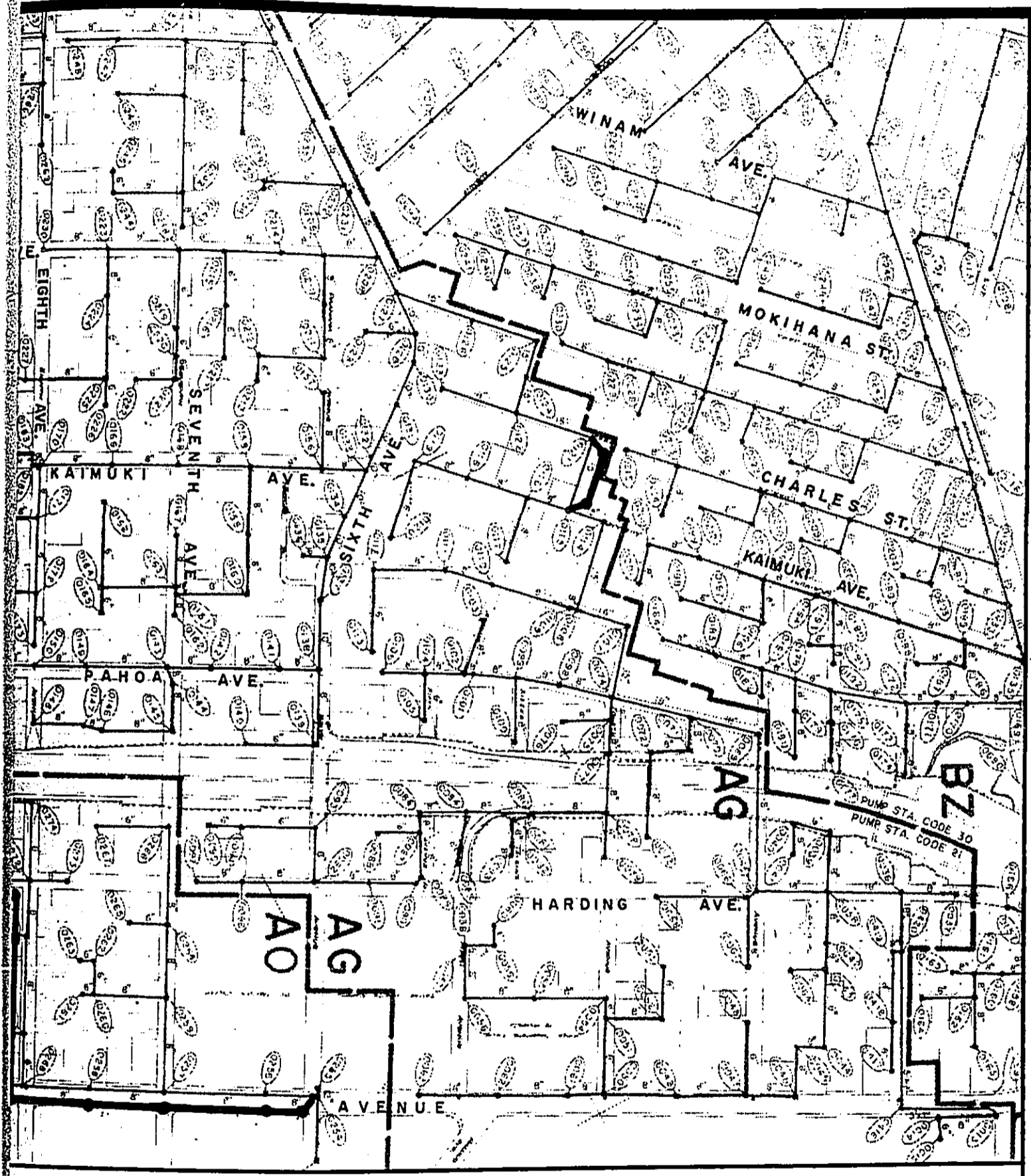
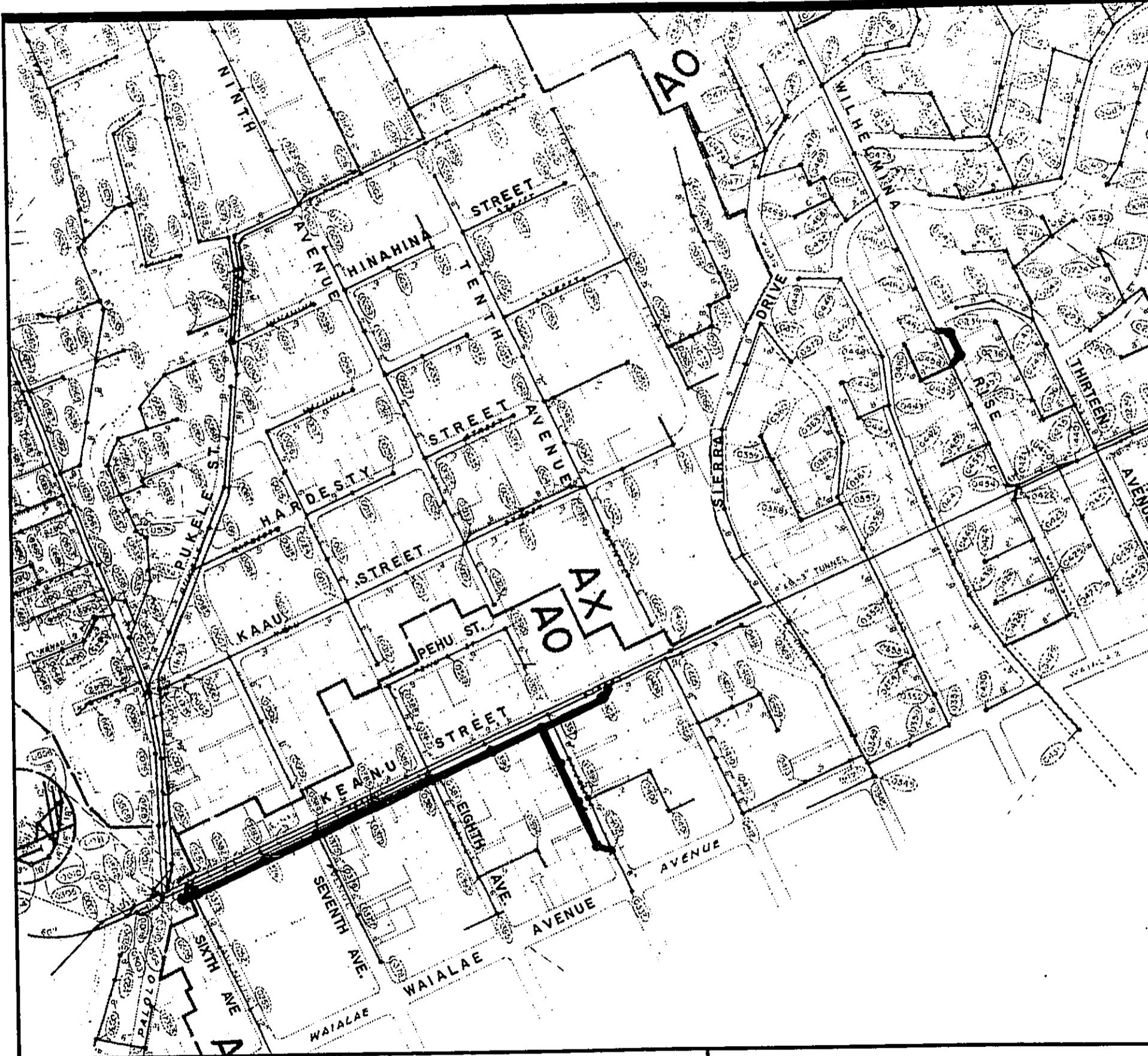


Figure A-50
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993

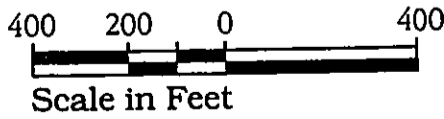
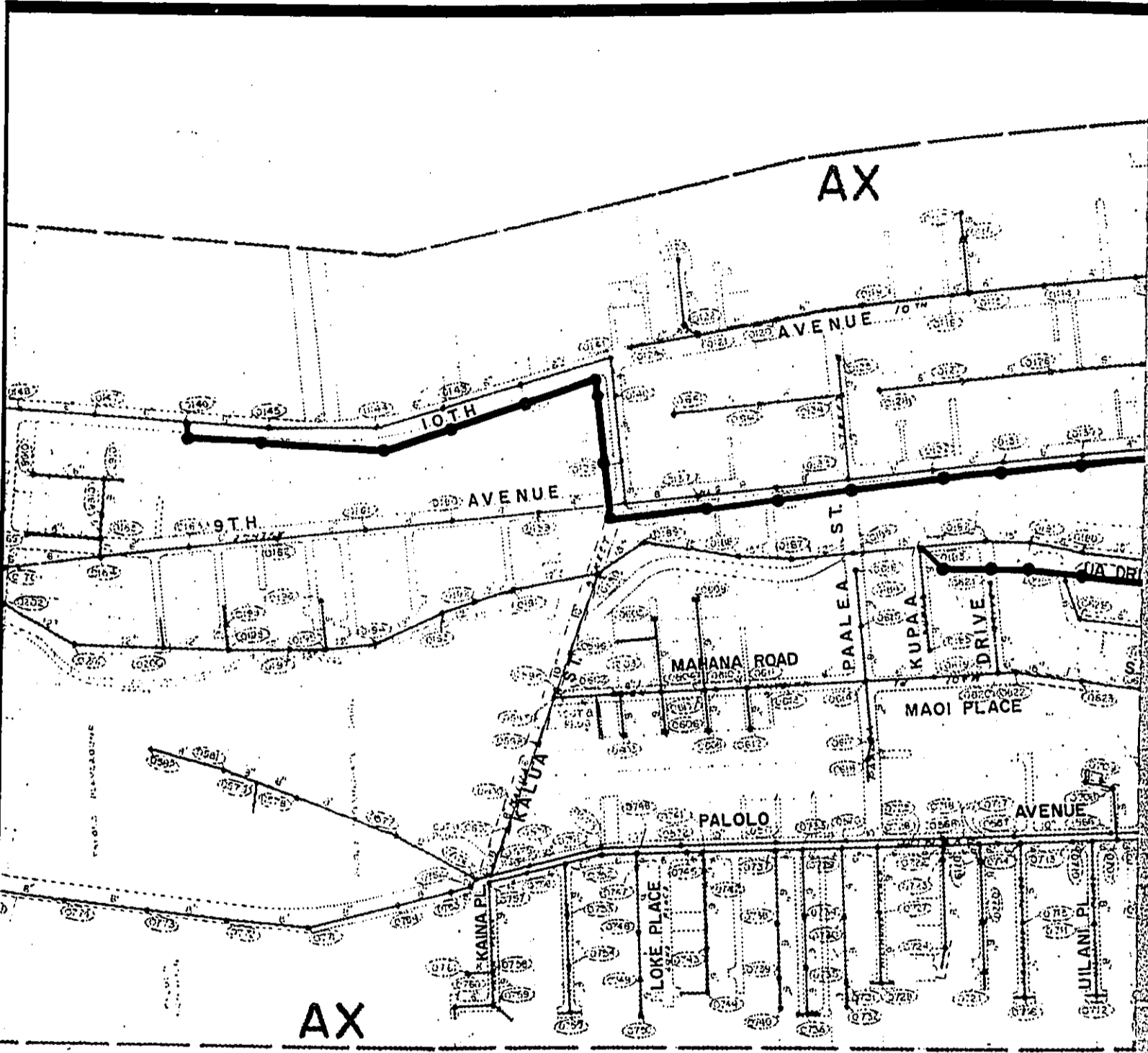
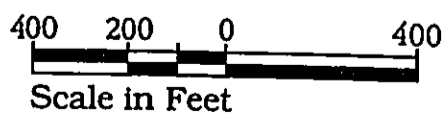




Figure A-51
Relief Sewers

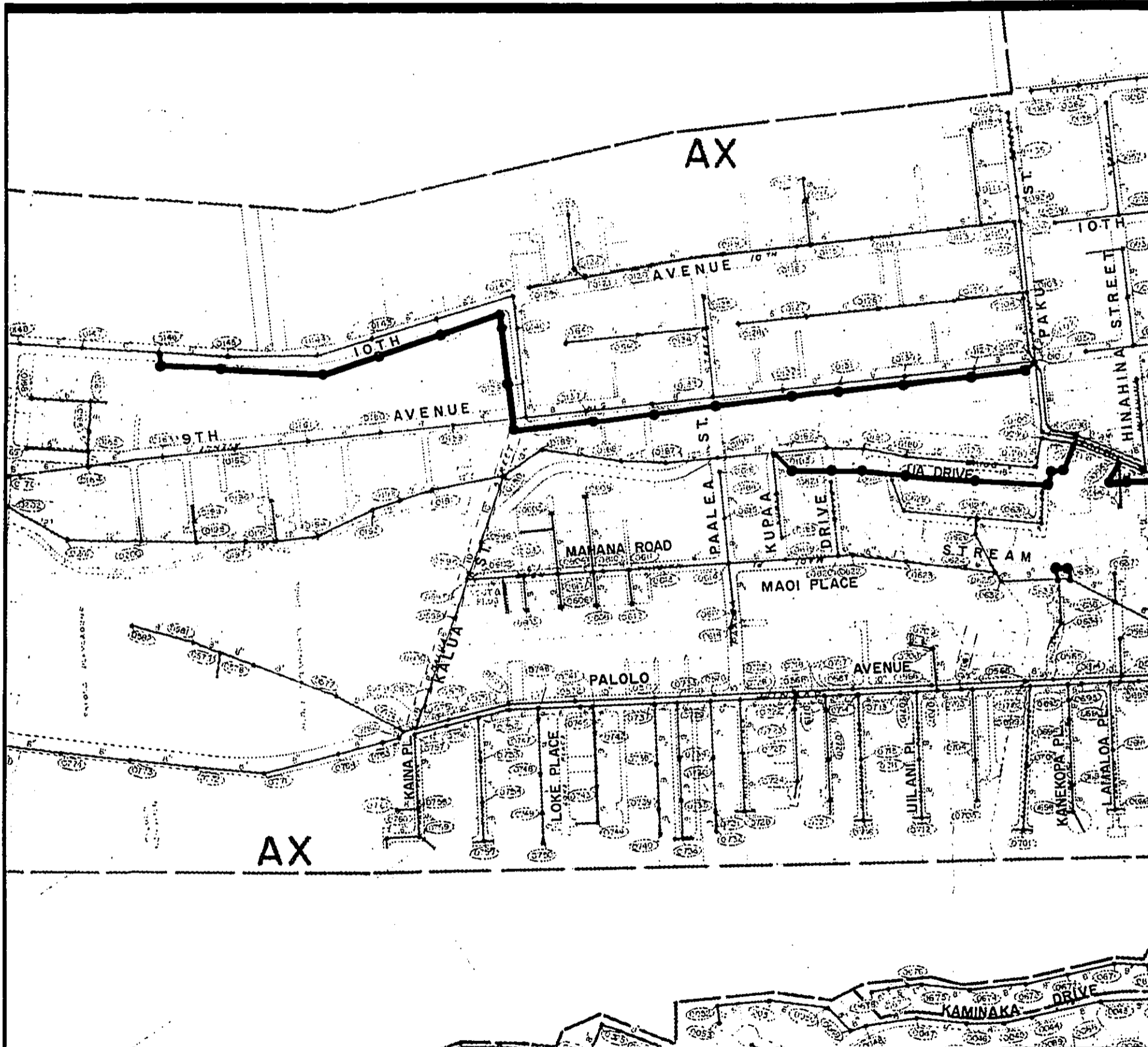


EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993

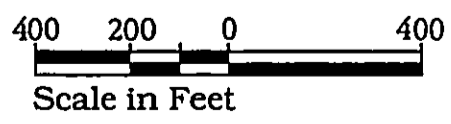


CORRECTION

THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



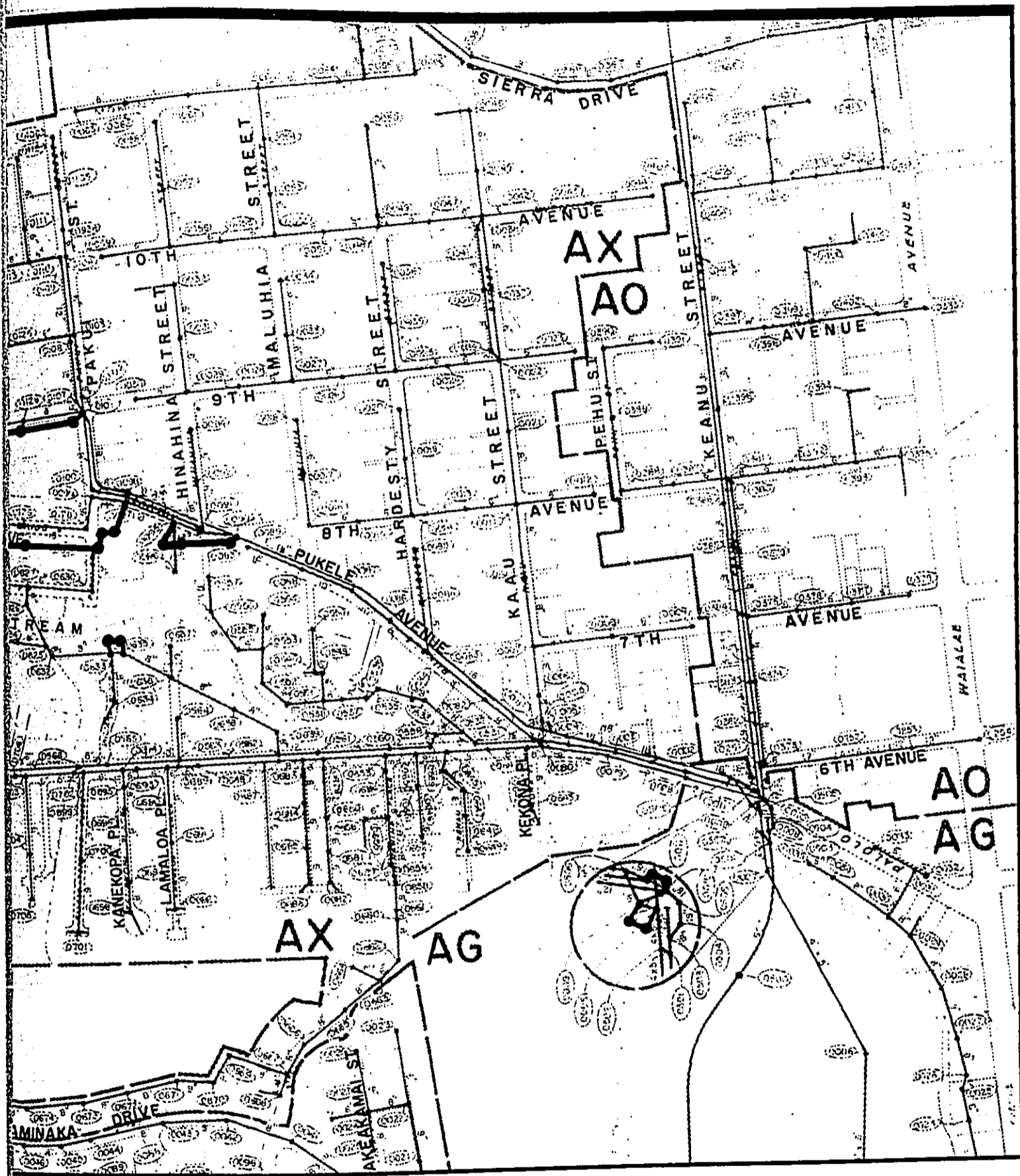
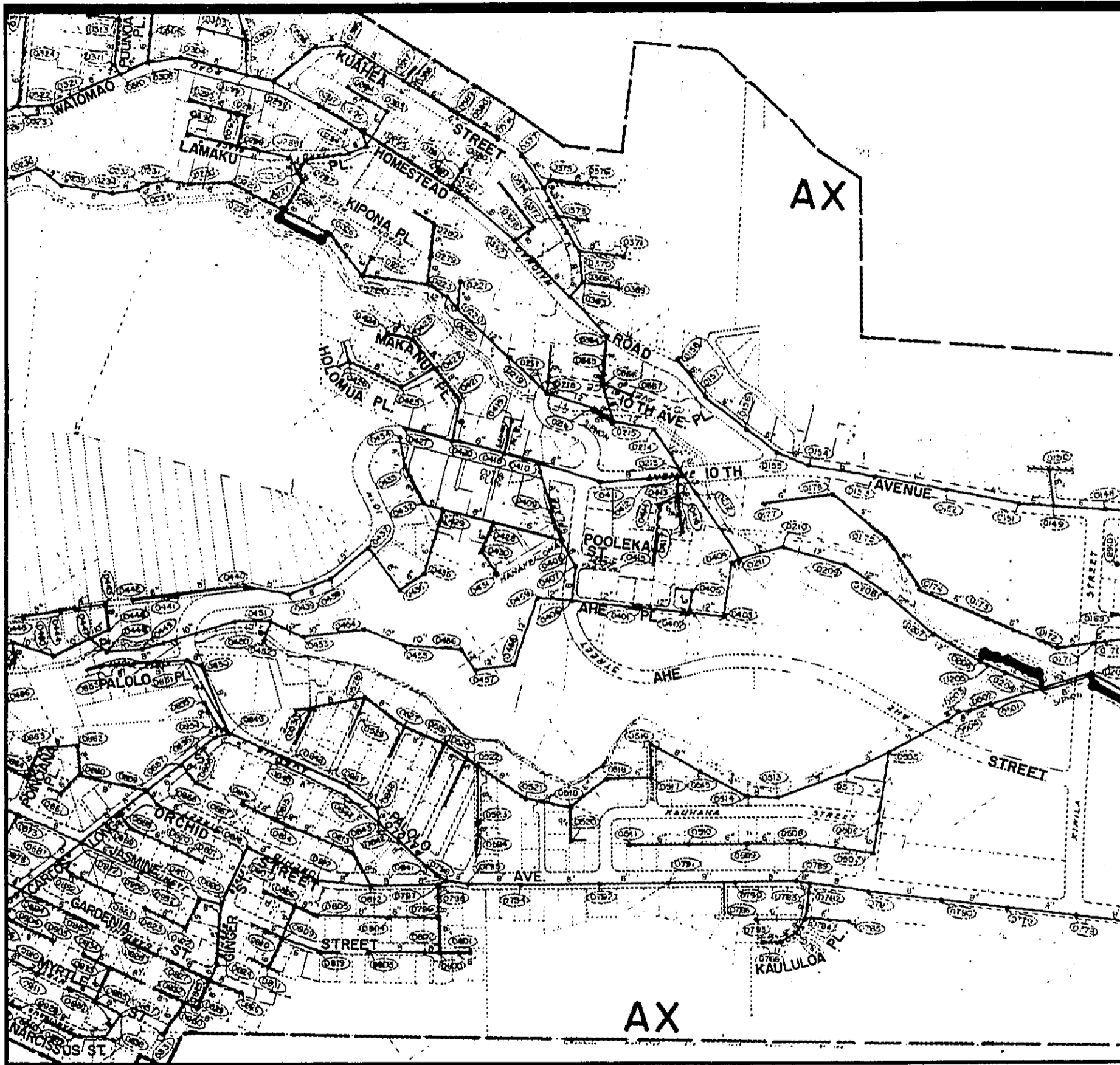
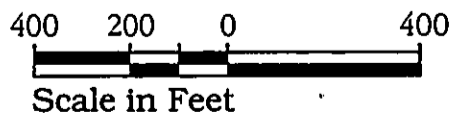


Figure A-52
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



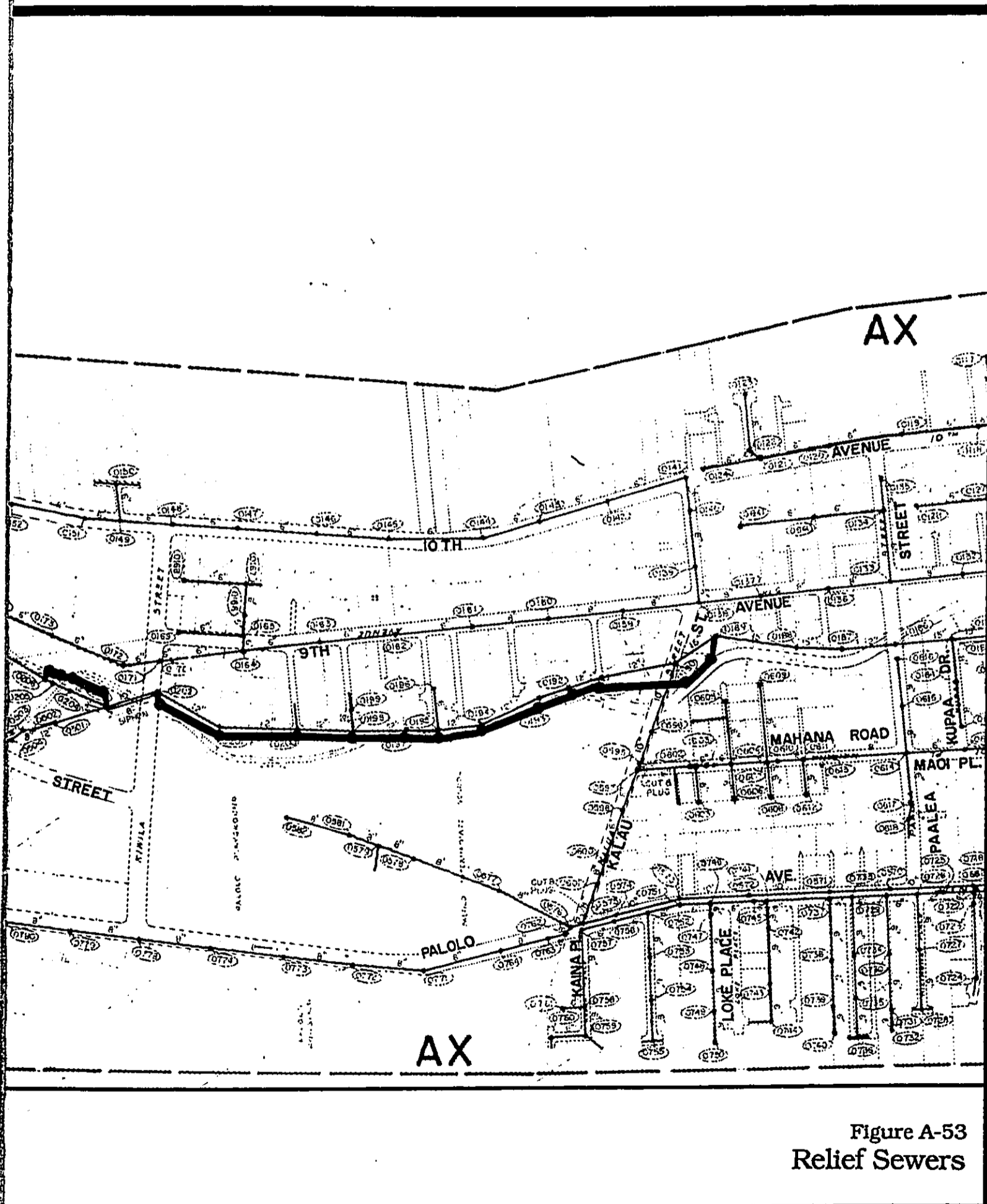
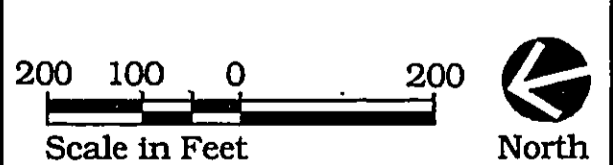


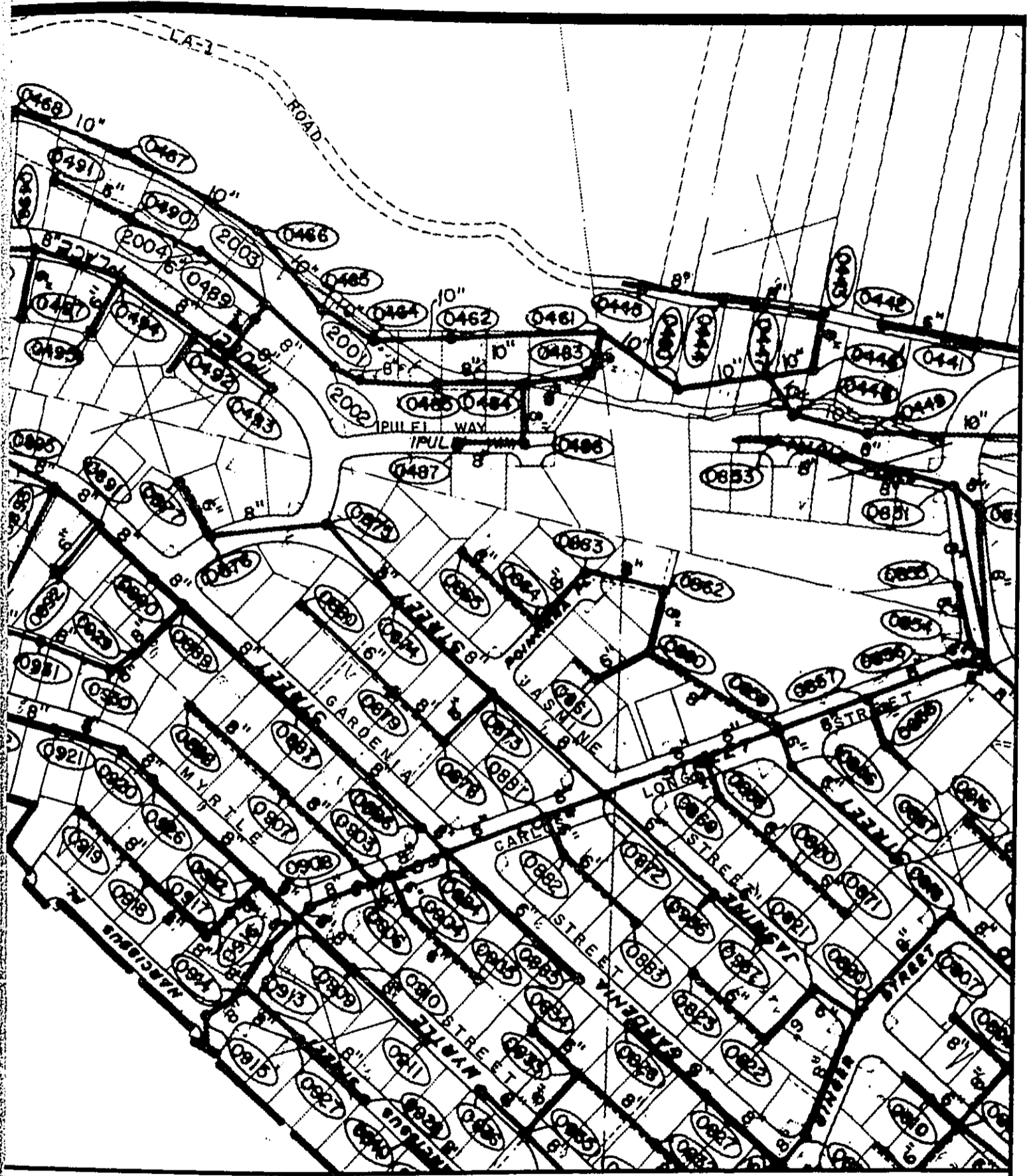
Figure A-53
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



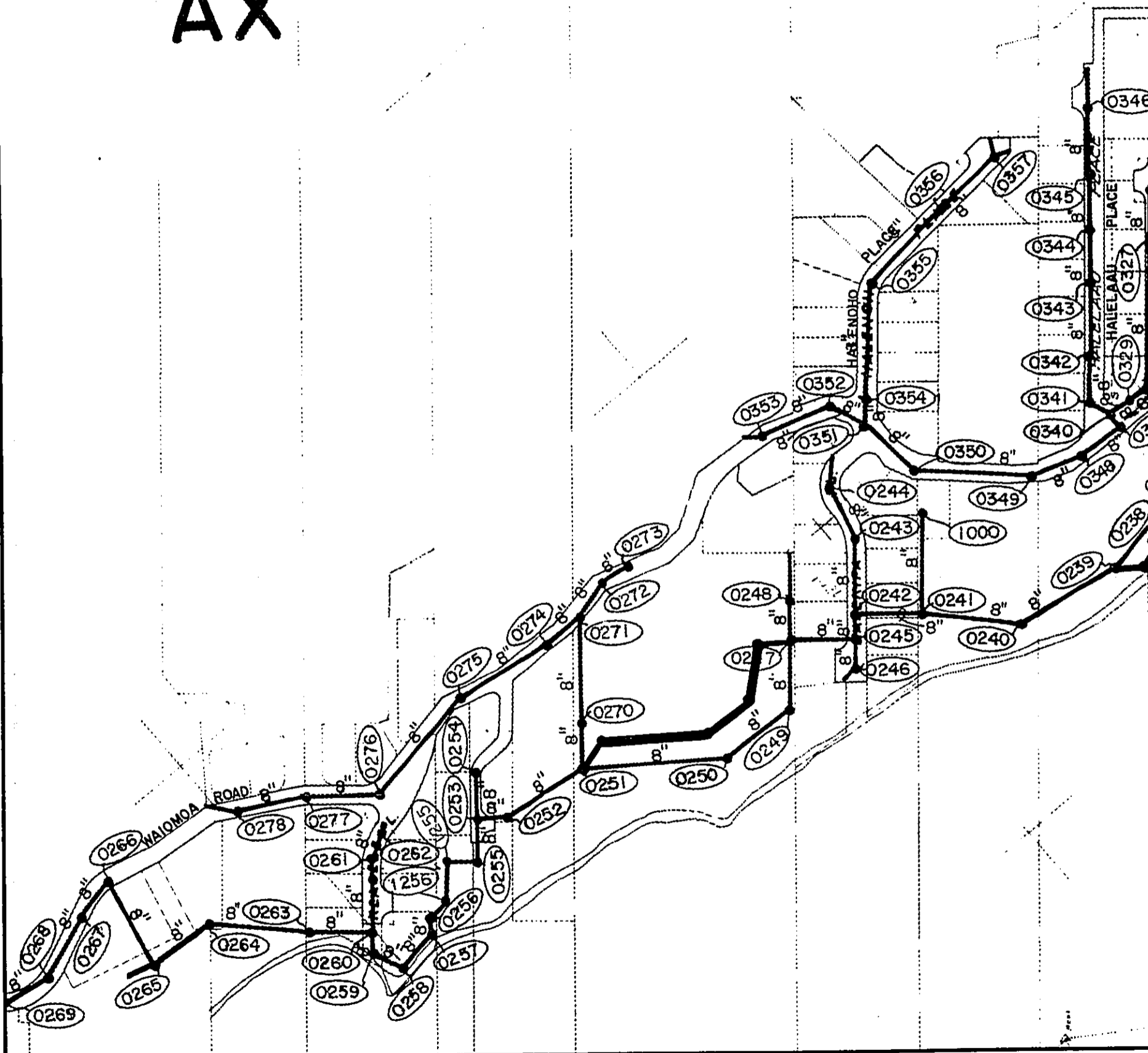
Note: No relief lines on this figure.



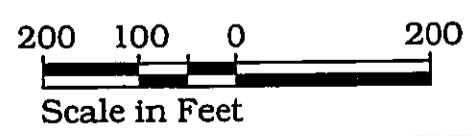
n this figure.

Figure A-54
Relief Sewers

AX



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
BELT COLLINS HAWAII • DECEMBER 1993



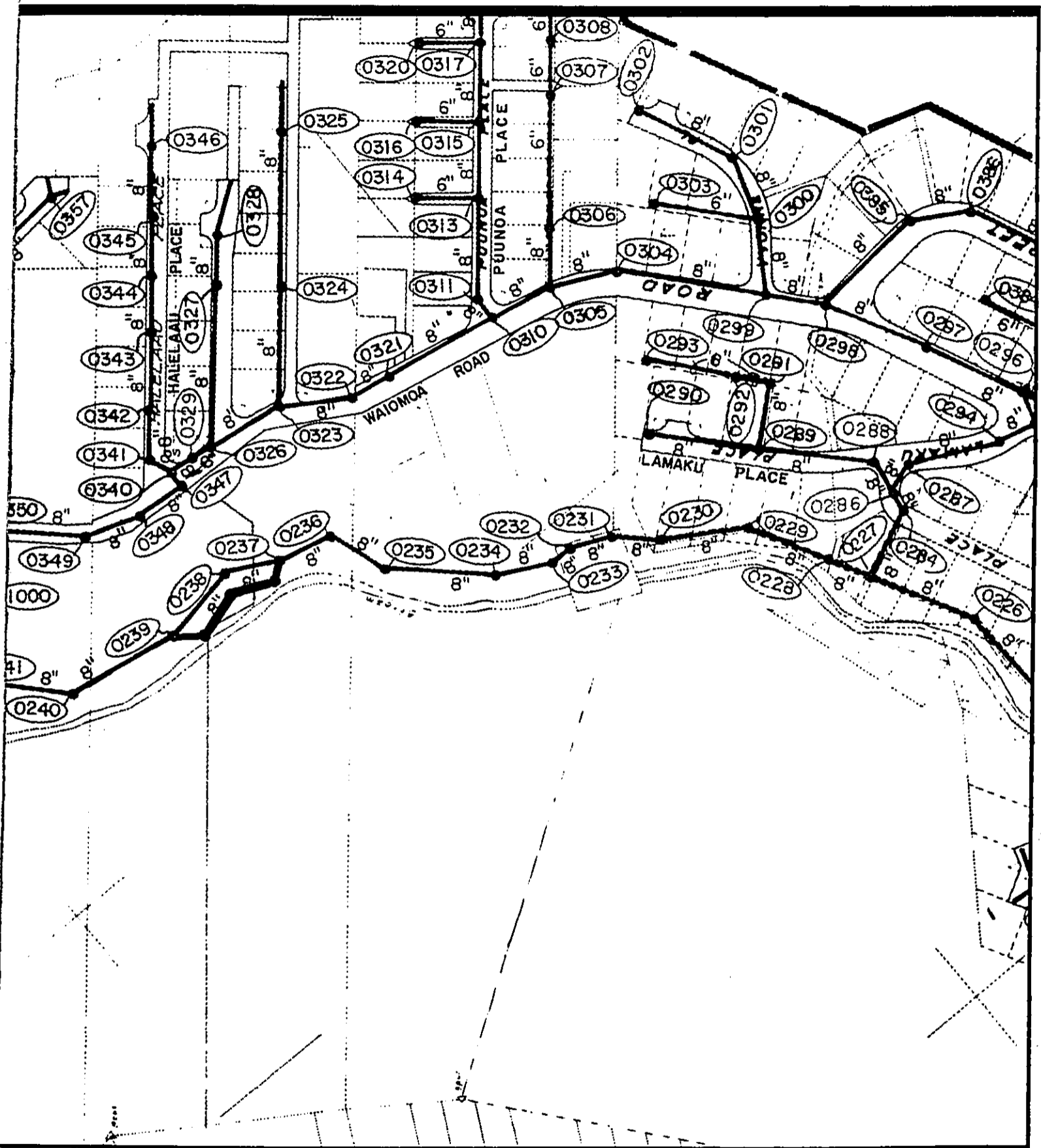
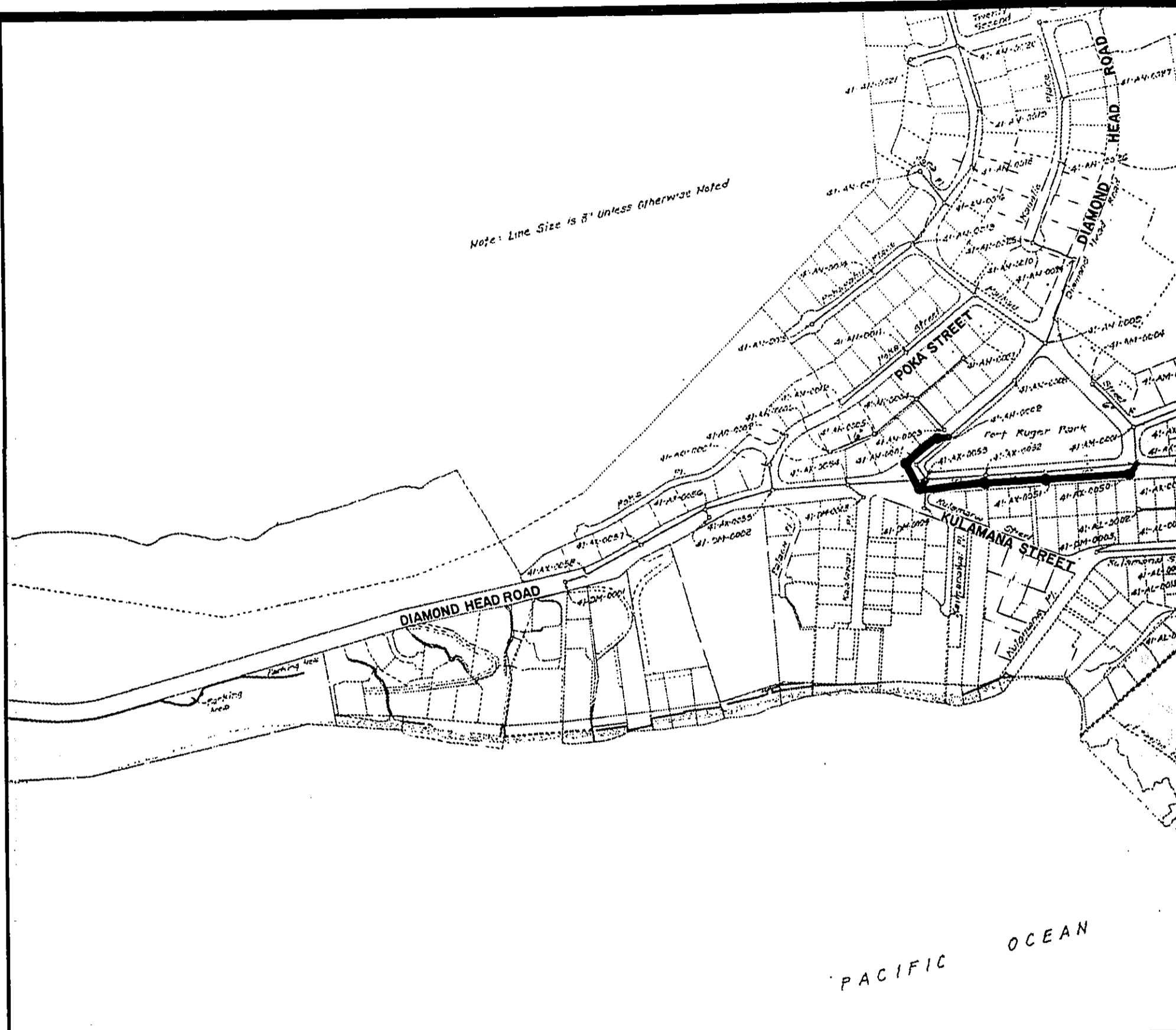
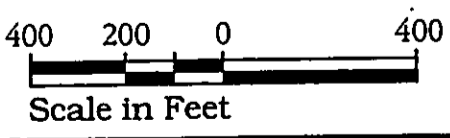


Figure A-55
Relief Sewers



Note: Line Size is 8' unless otherwise noted

EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



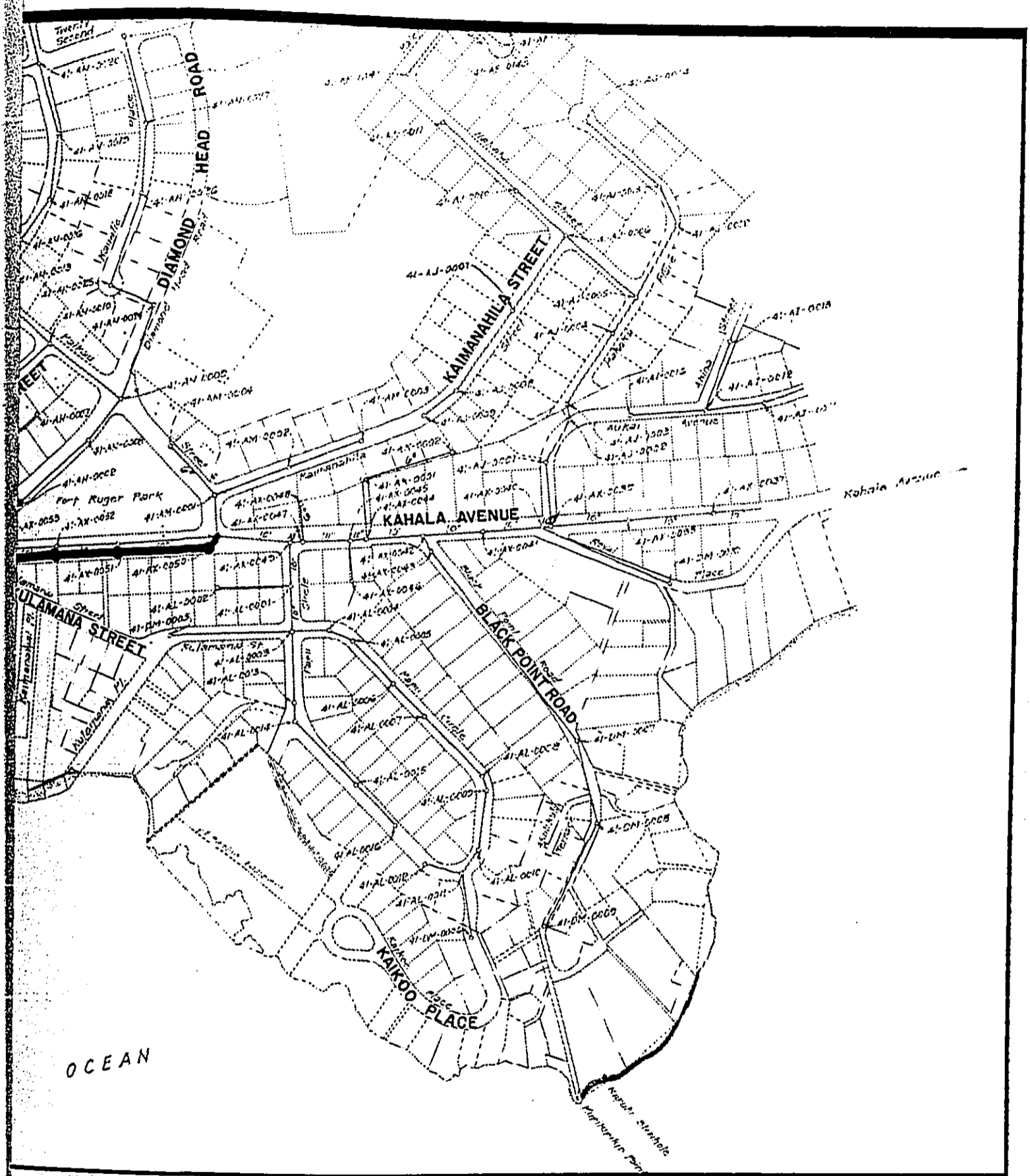
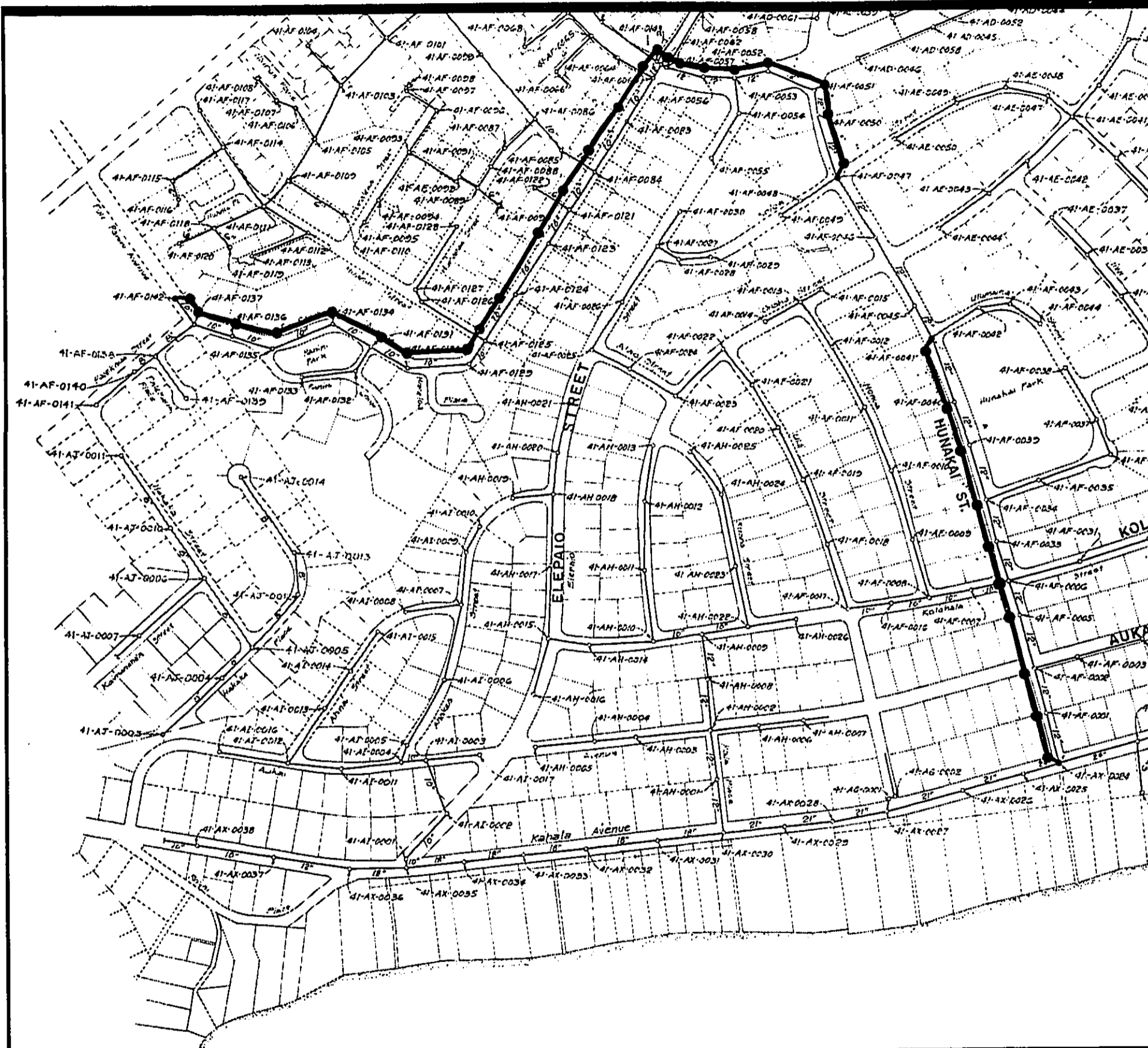
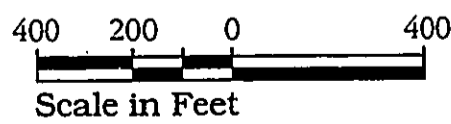
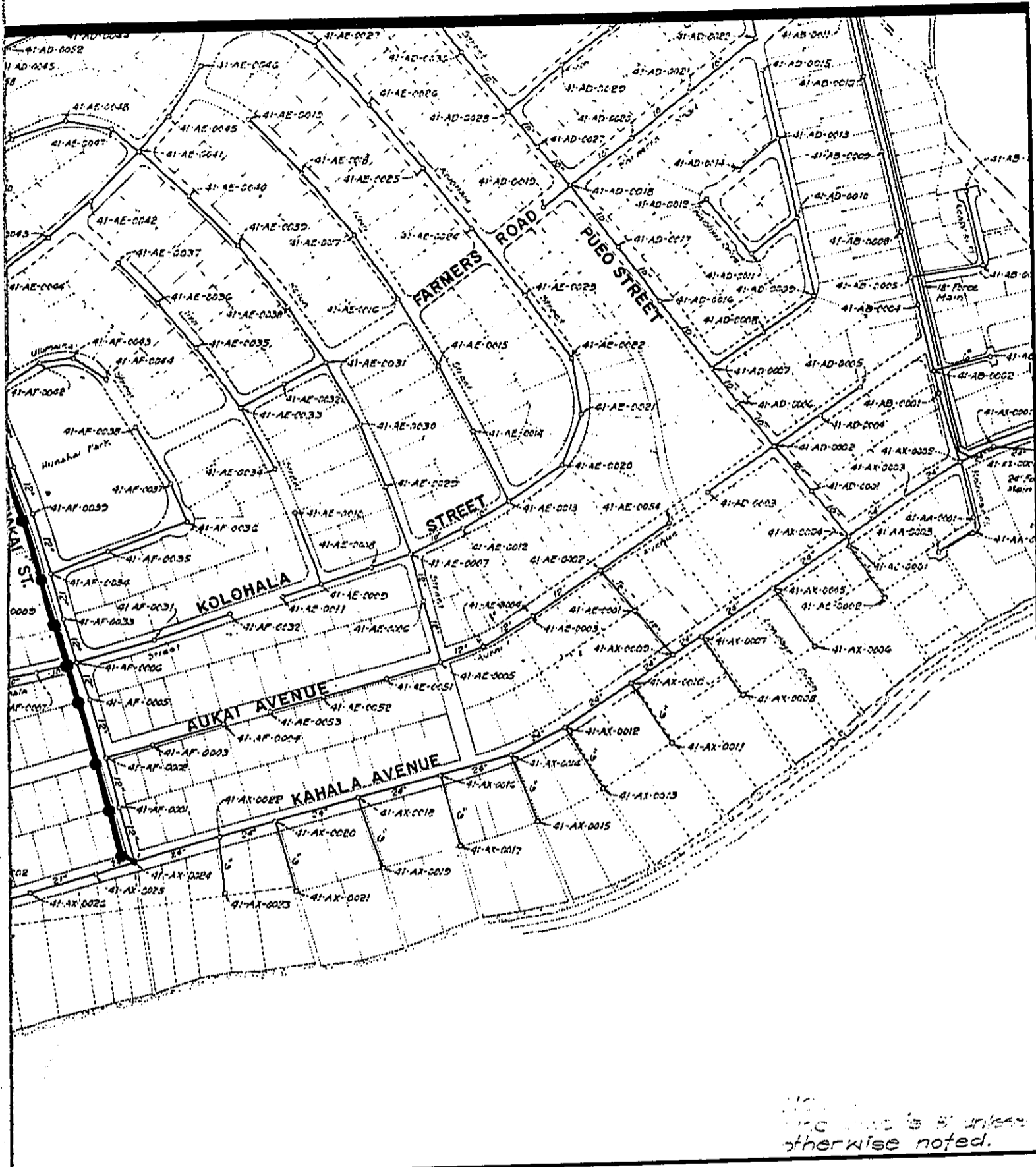


Figure A-56
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993

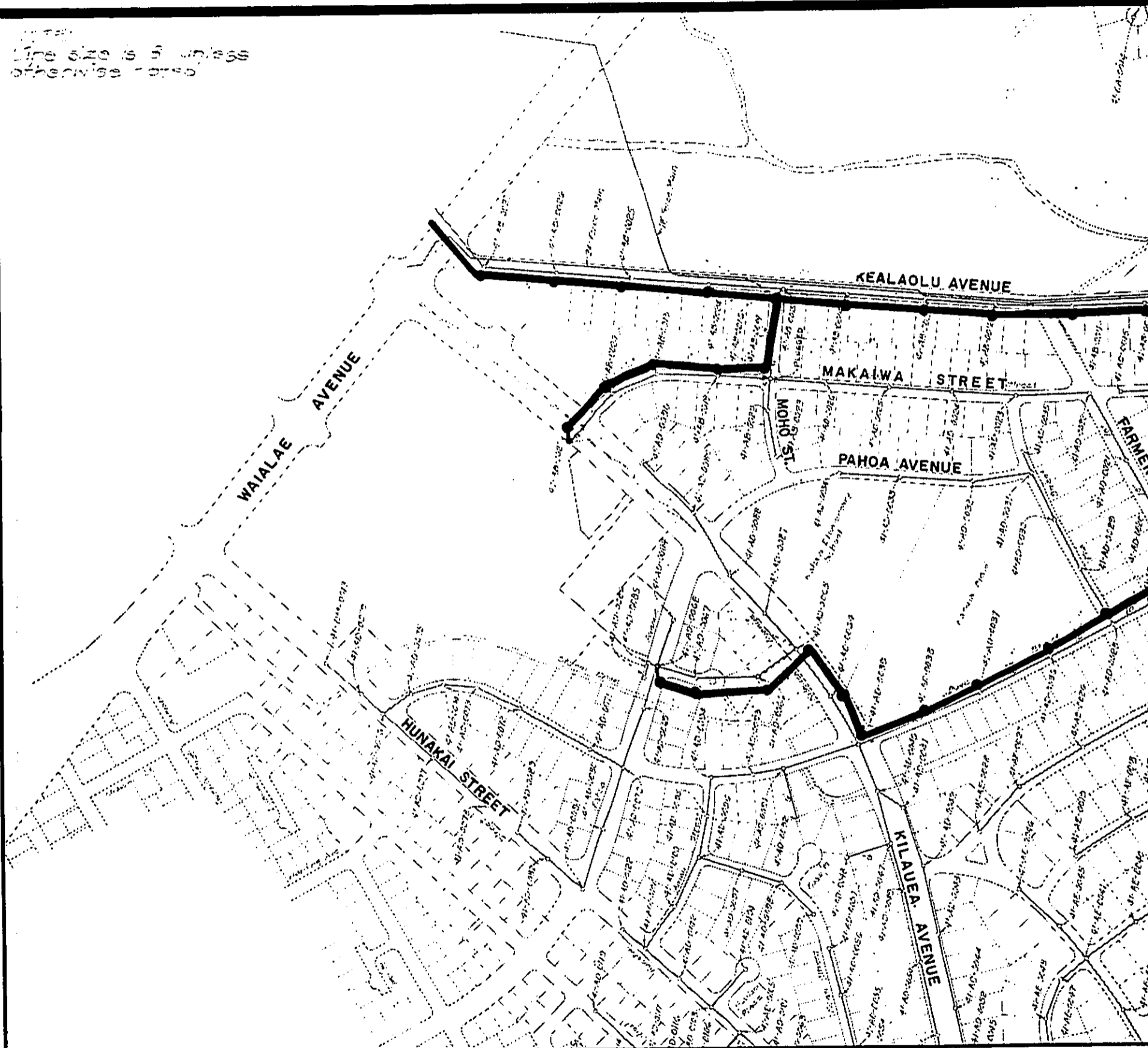




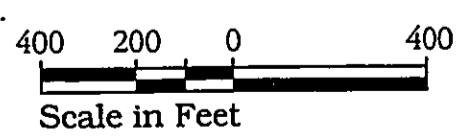
The depth is 8' unless otherwise noted.

Figure A-57
Relief Sewers

Line size is 1/8" unless
otherwise noted



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
BELT COLLINS HAWAII • DECEMBER 1993



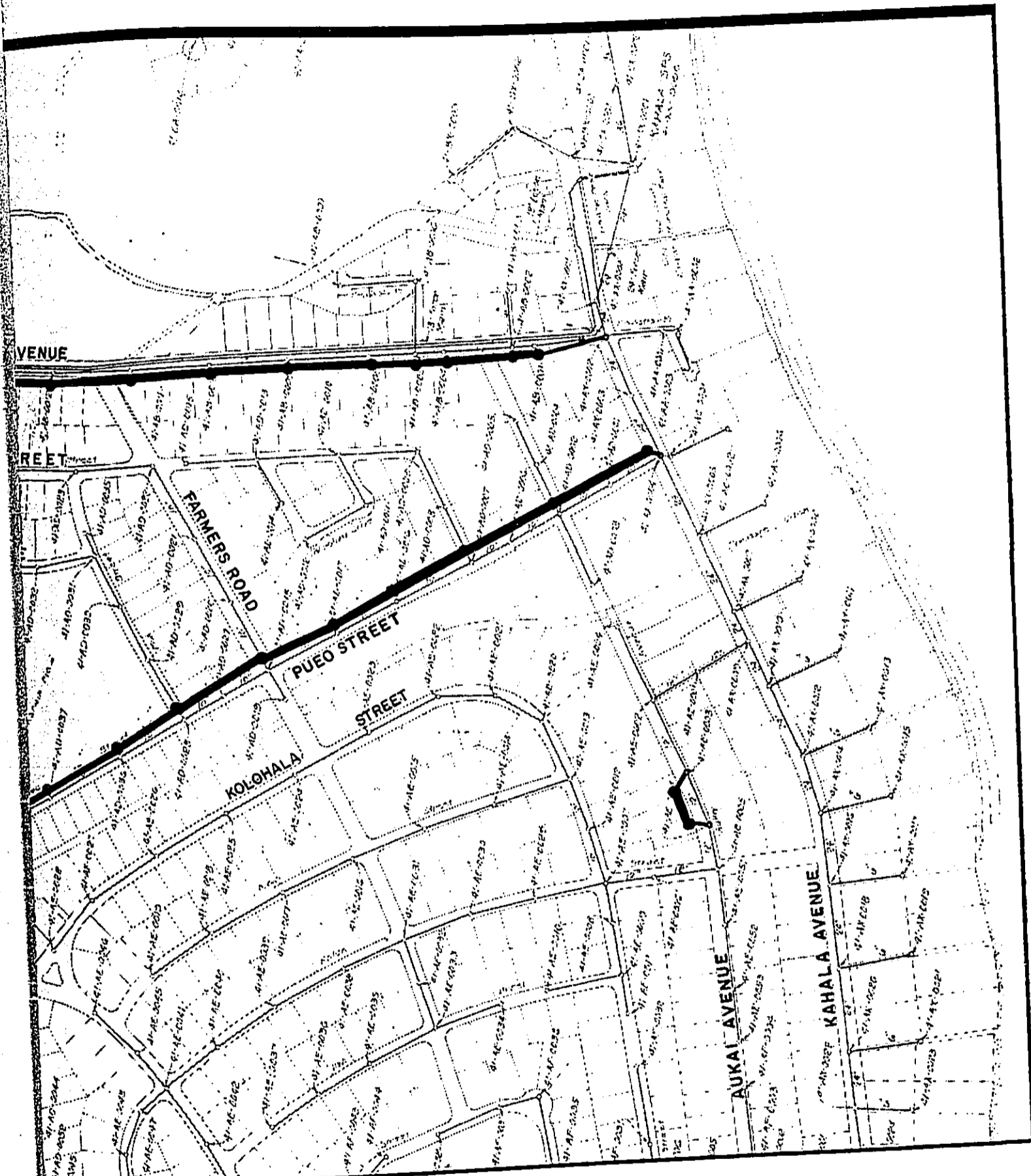
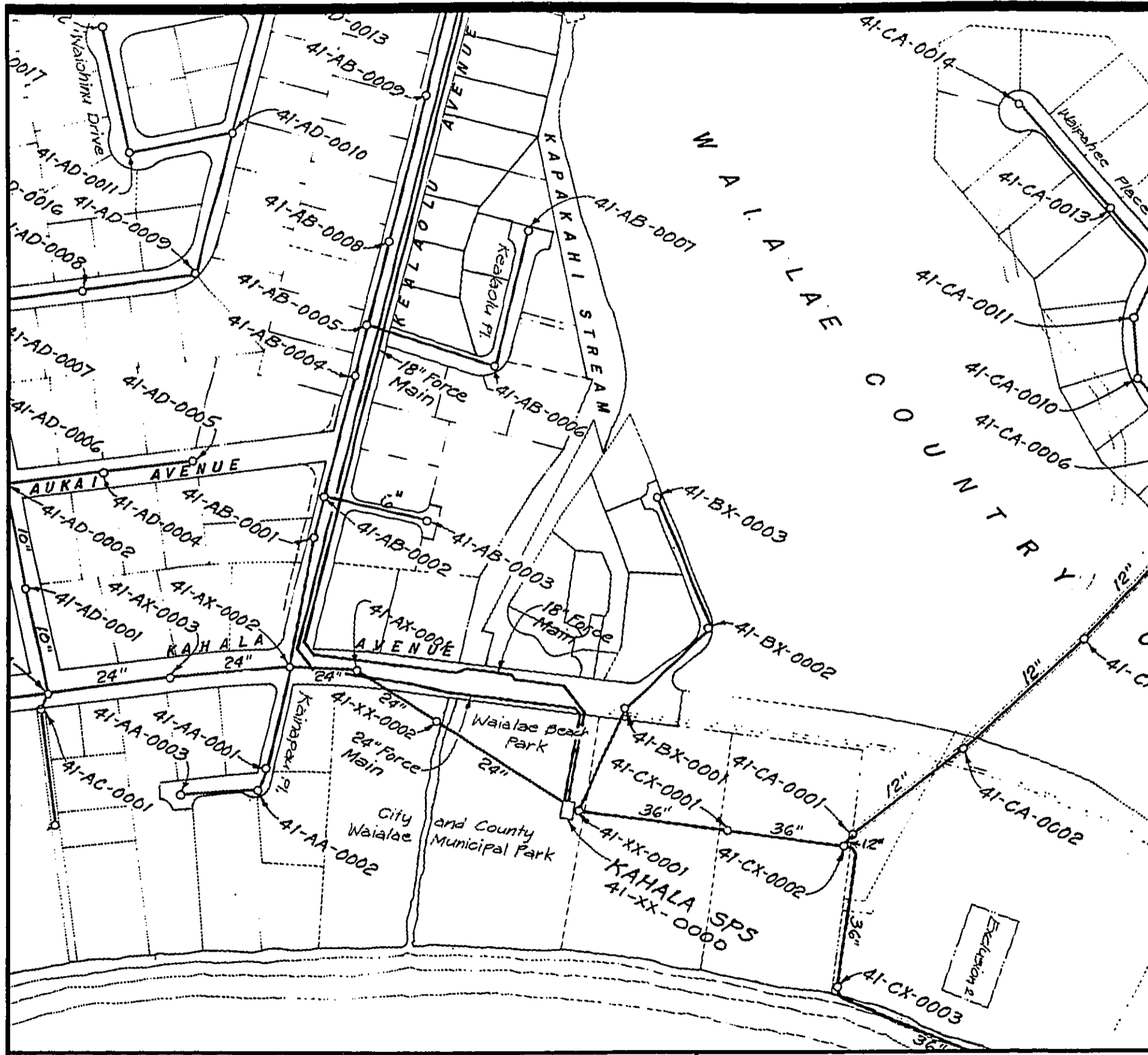
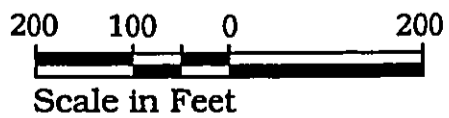


Figure A-58
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993

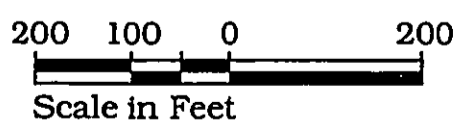


North

NOTE:
 NO RELIEF LINE
 ON THIS FIGURE.



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



NOTE:
Line size is 3" unless
otherwise noted.

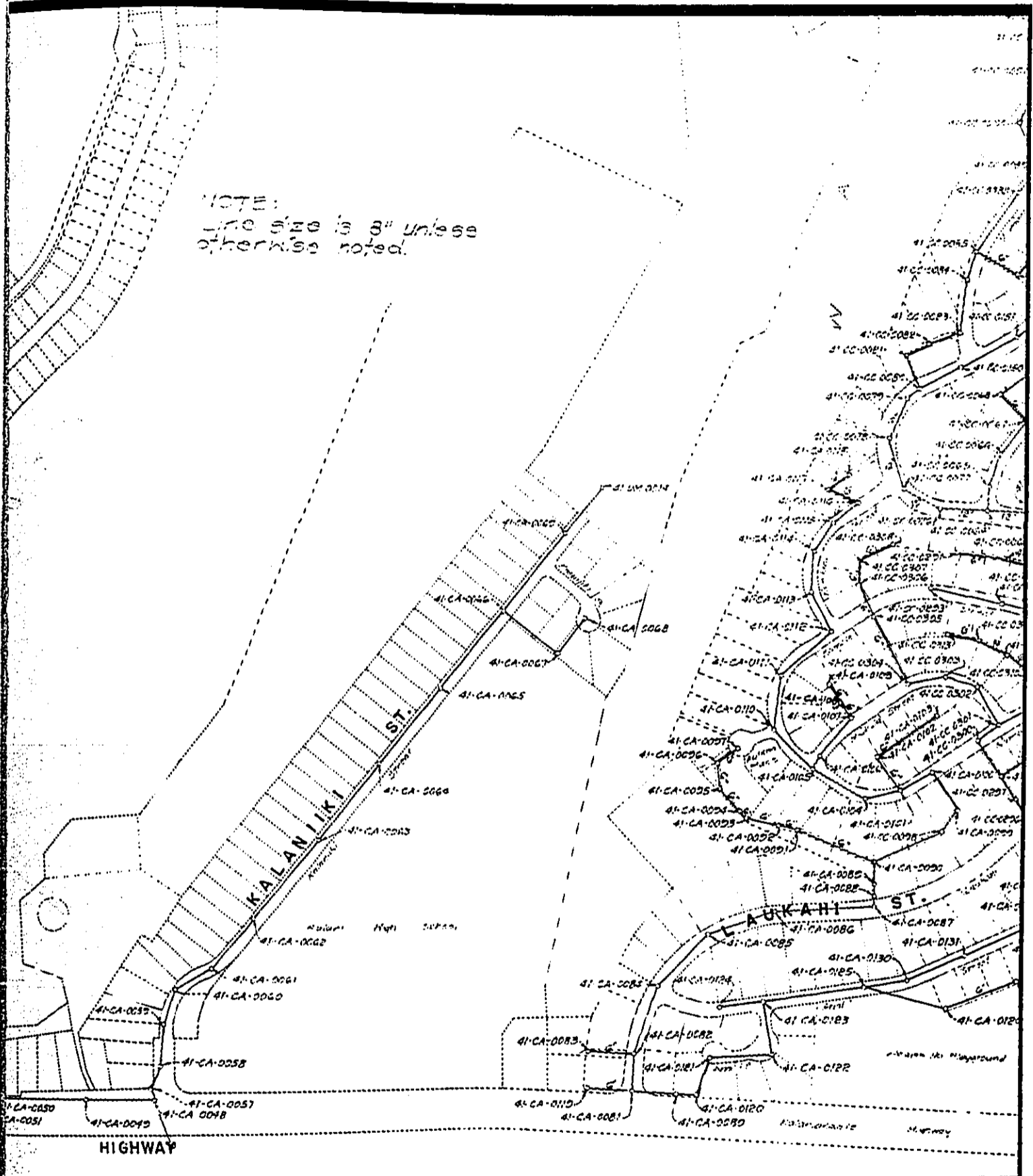
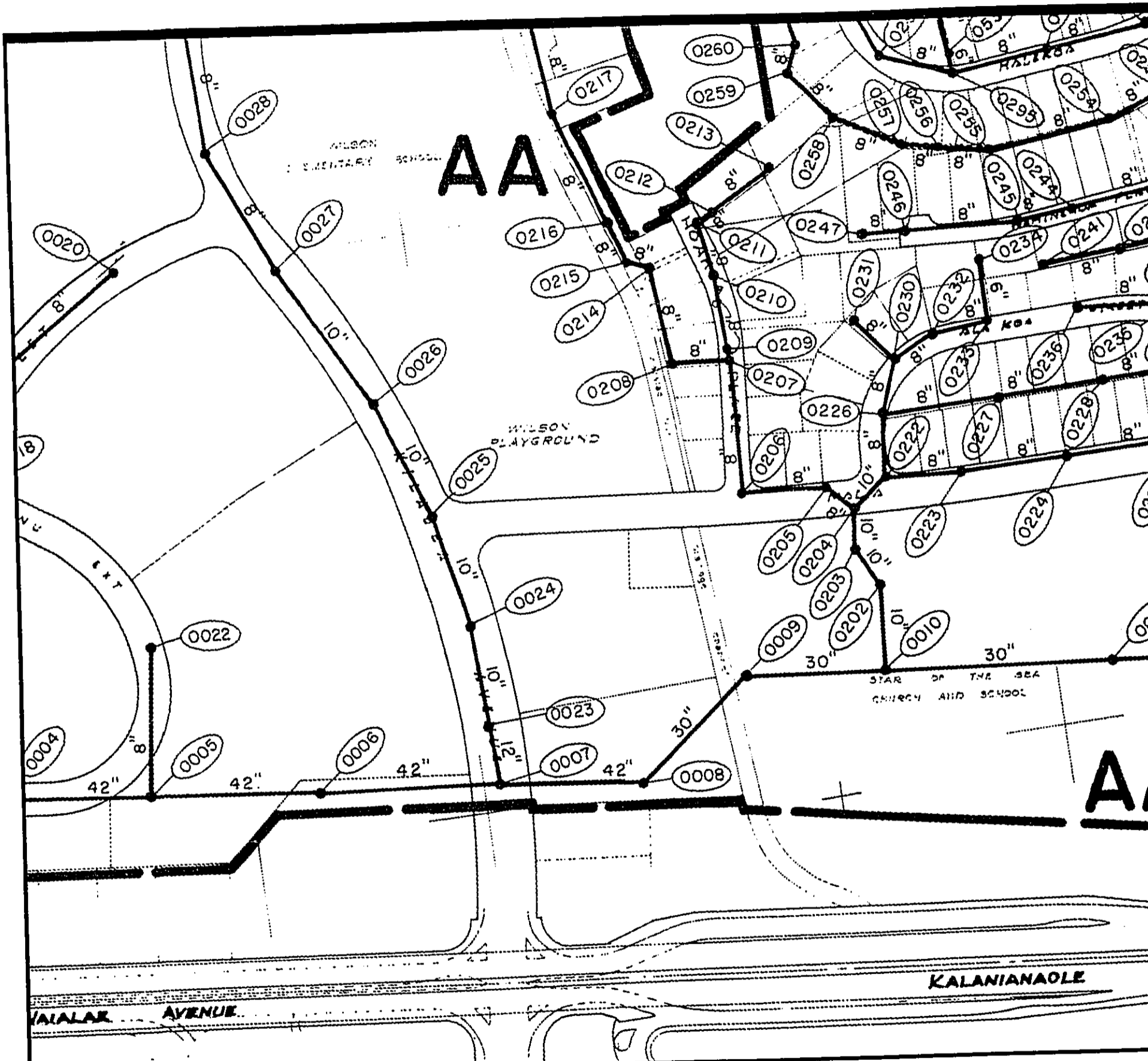
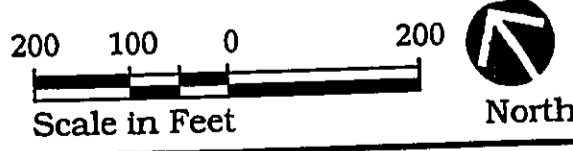


Figure A-60
Relief Sewers



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



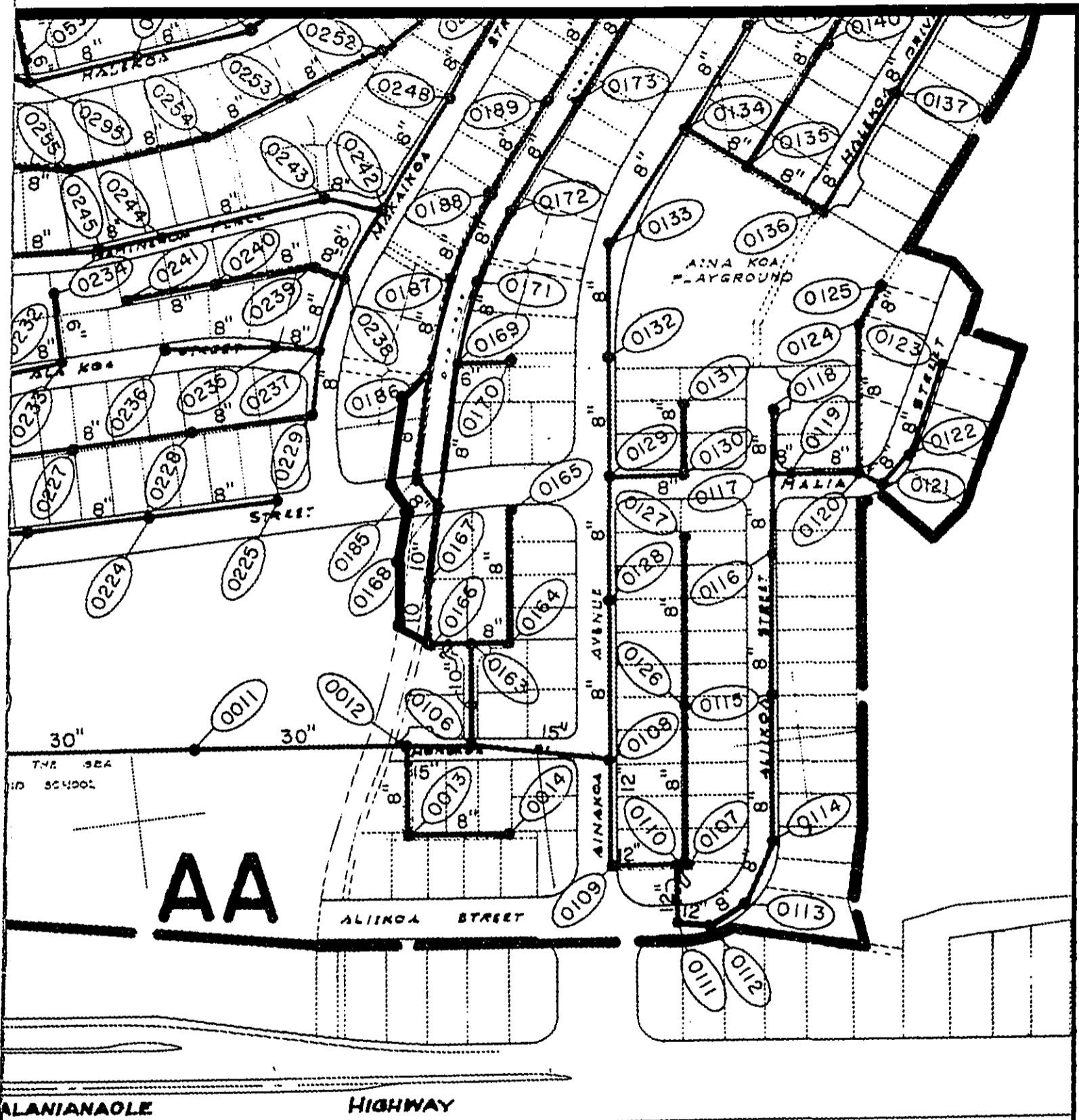
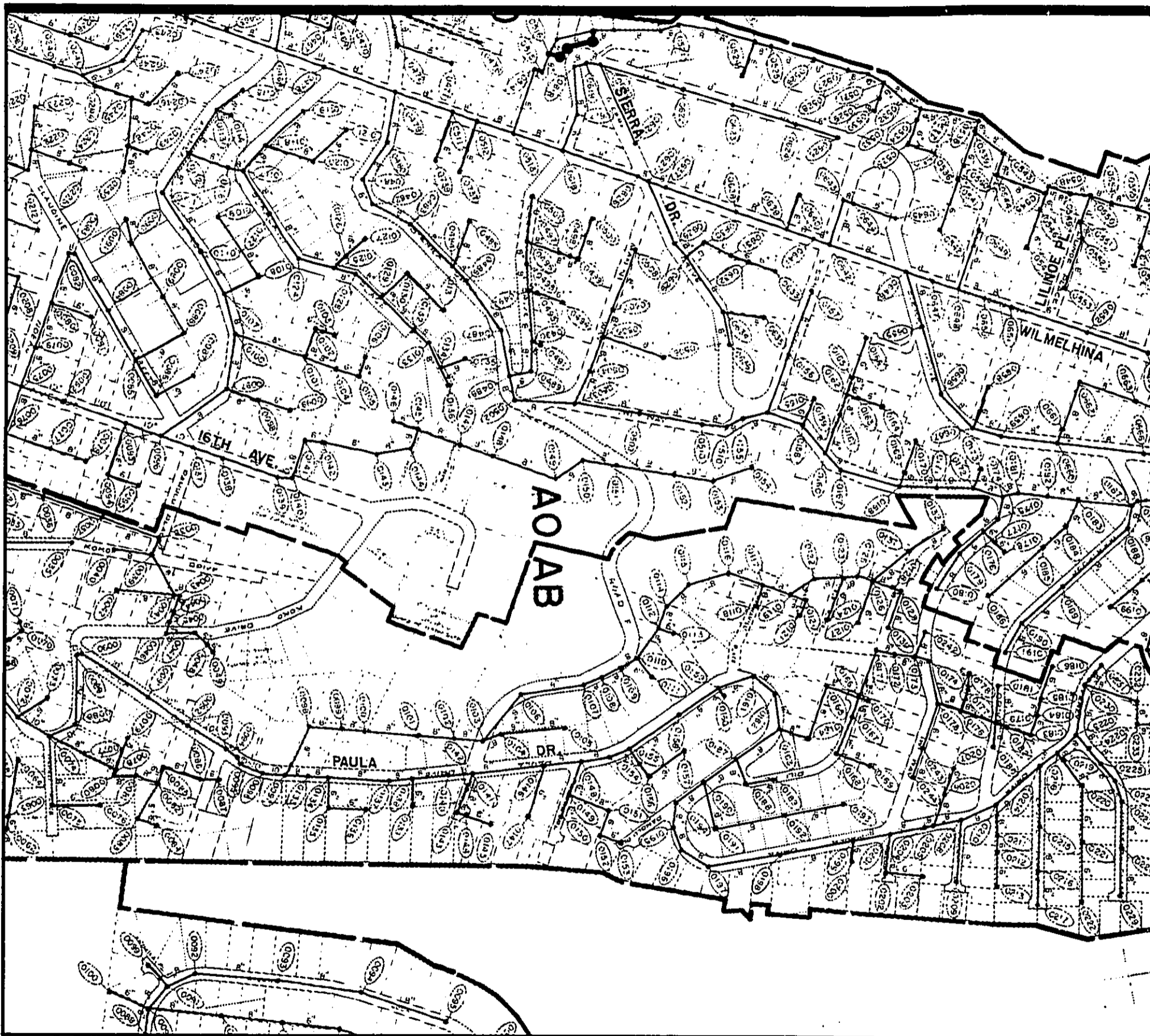
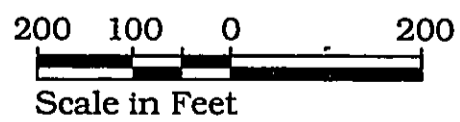


Figure A-61
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



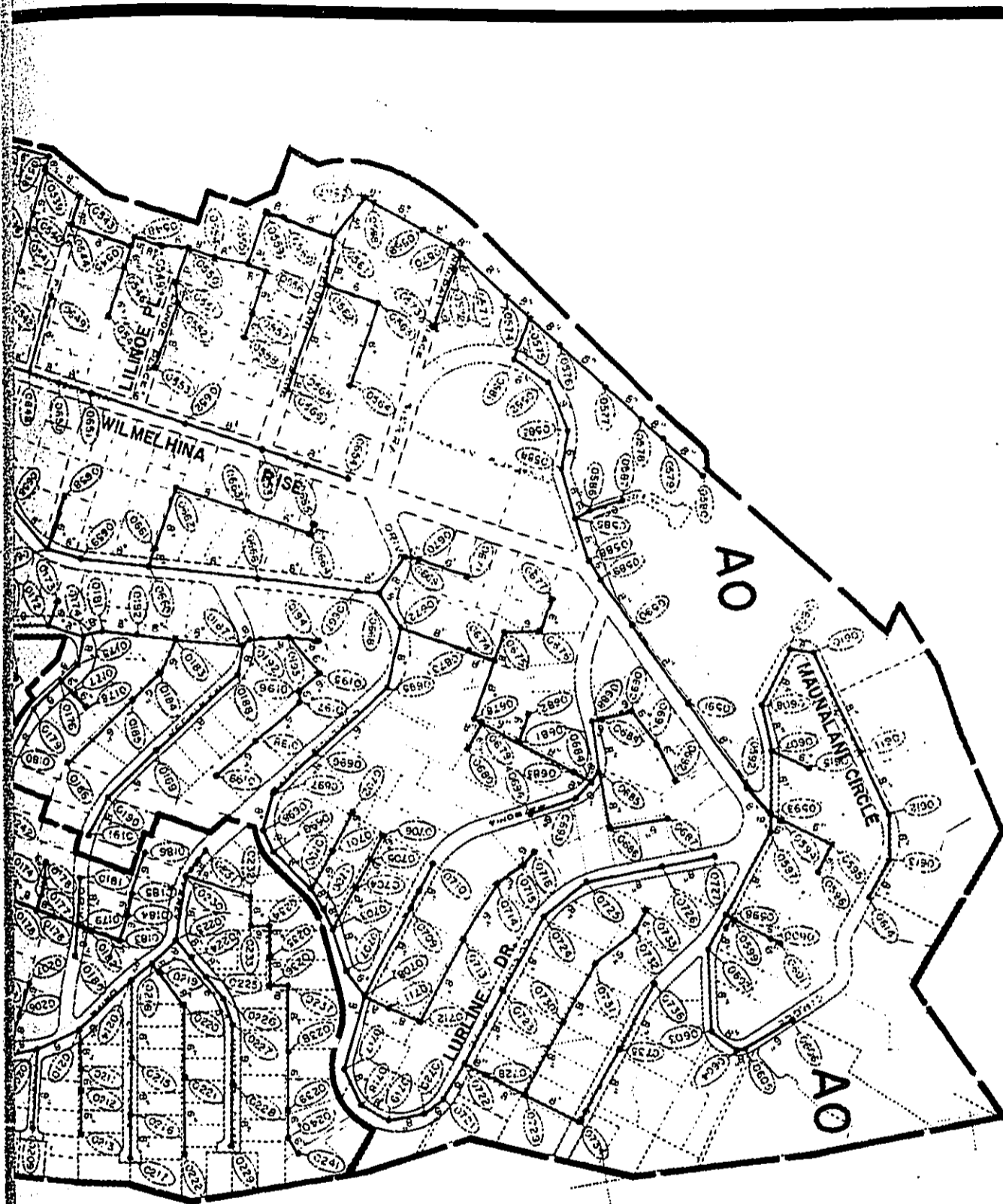
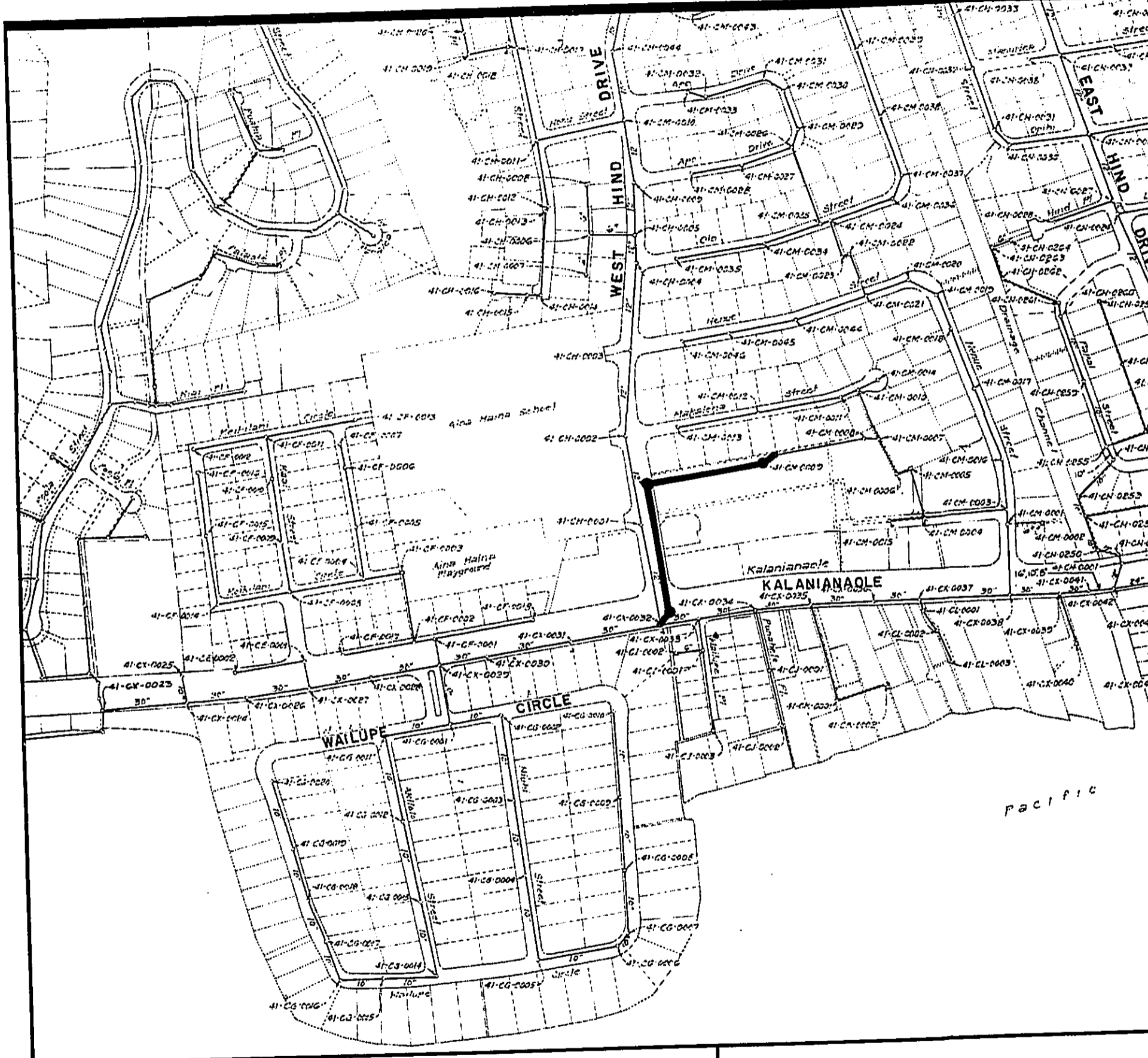
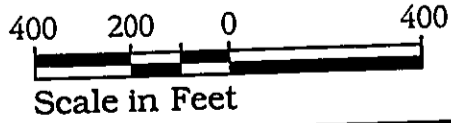


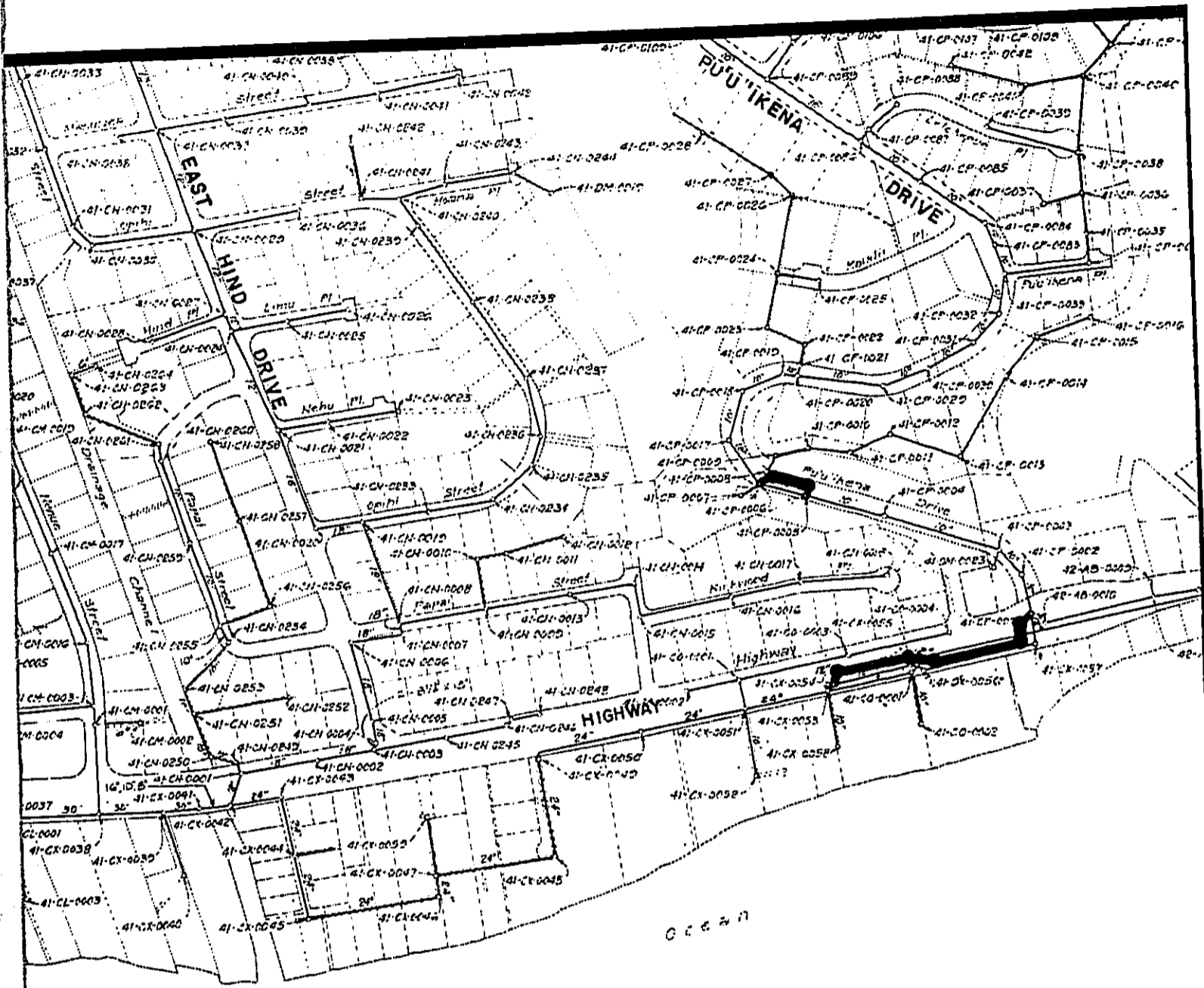
Figure A-62
Relief Sewers



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



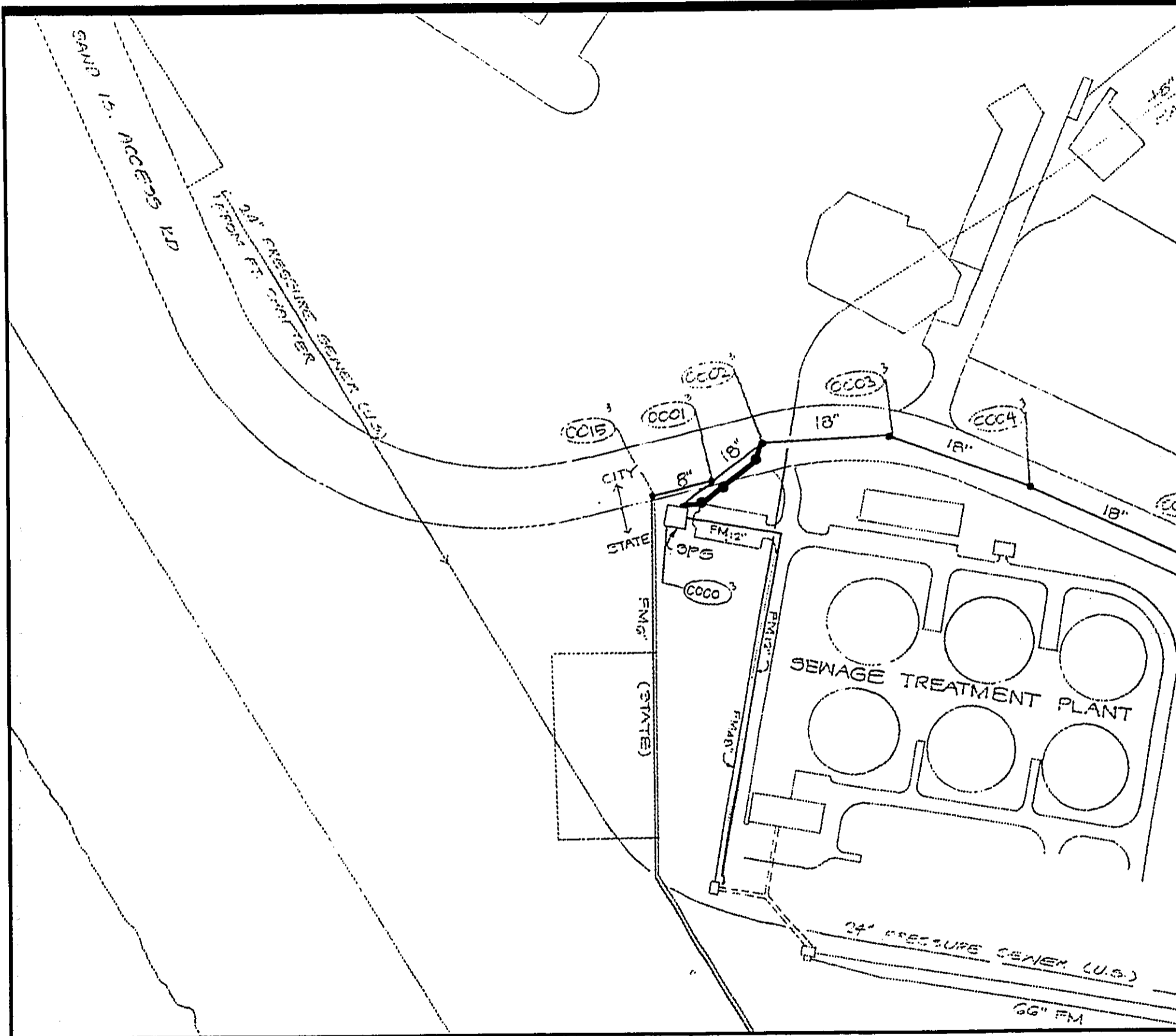
North



Pacific

Note: Line Size is 8" Unless Otherwise Noted.

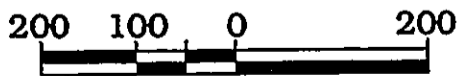
Figure A-63
Relief Sewers



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT

BELT COLLINS HAWAII • DECEMBER 1993



Scale in Feet



North

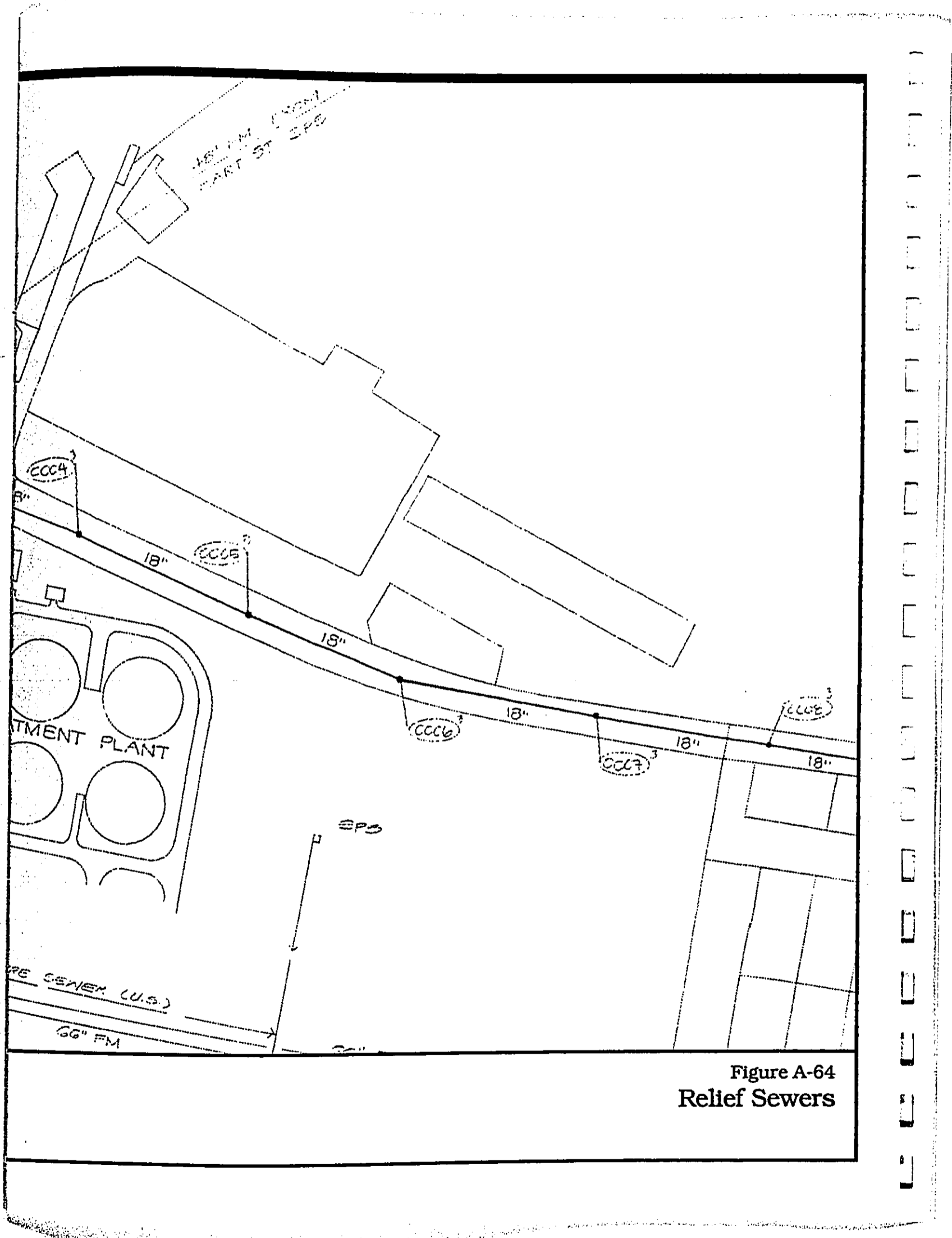
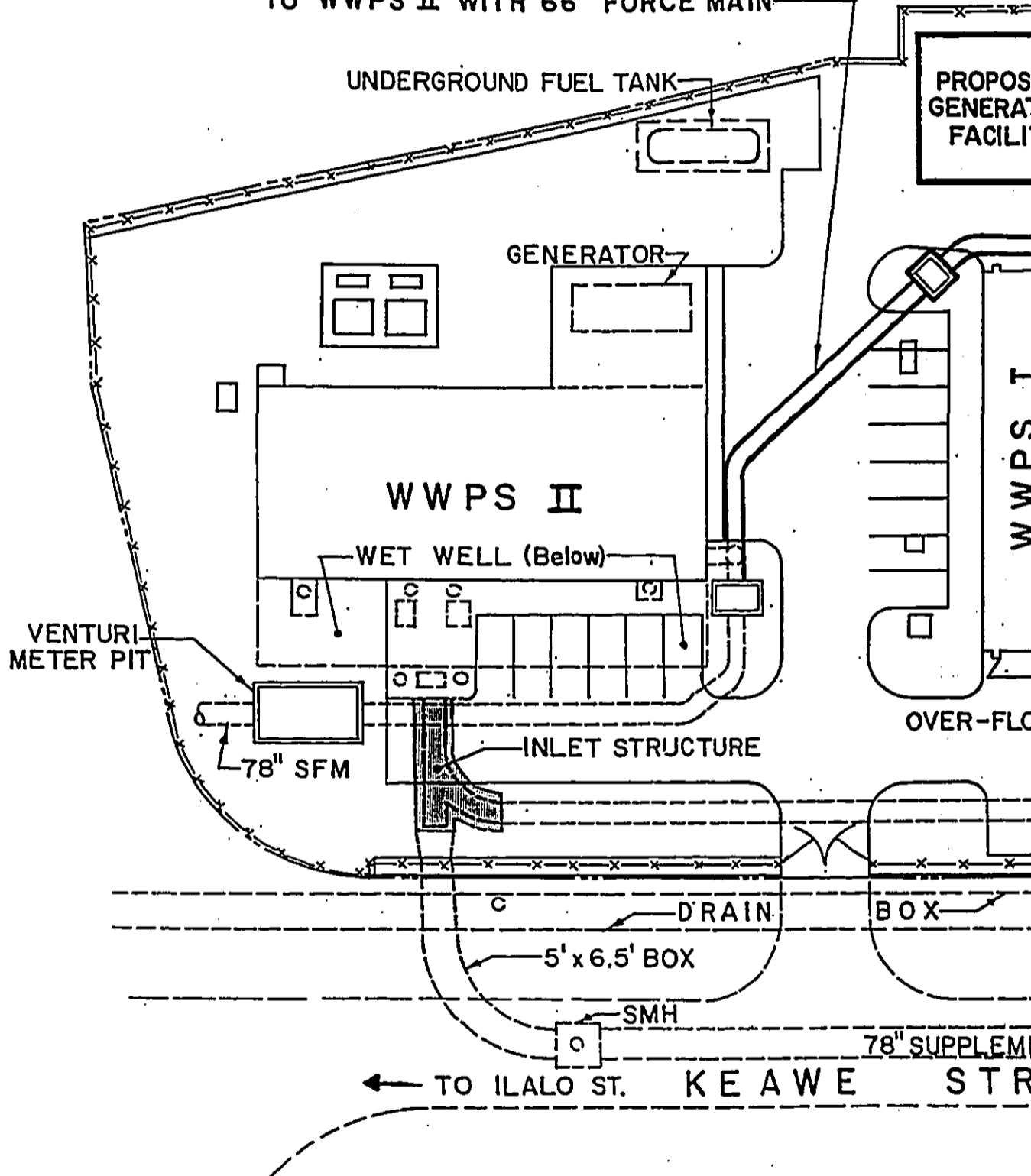


Figure A-64
Relief Sewers

REPLACE EXISTING 48" FORCE MAIN SECTION
TO WWPS II WITH 66" FORCE MAIN



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT

BELT COLLINS HAWAII • DECEMBER 1993

Not to Scale



North

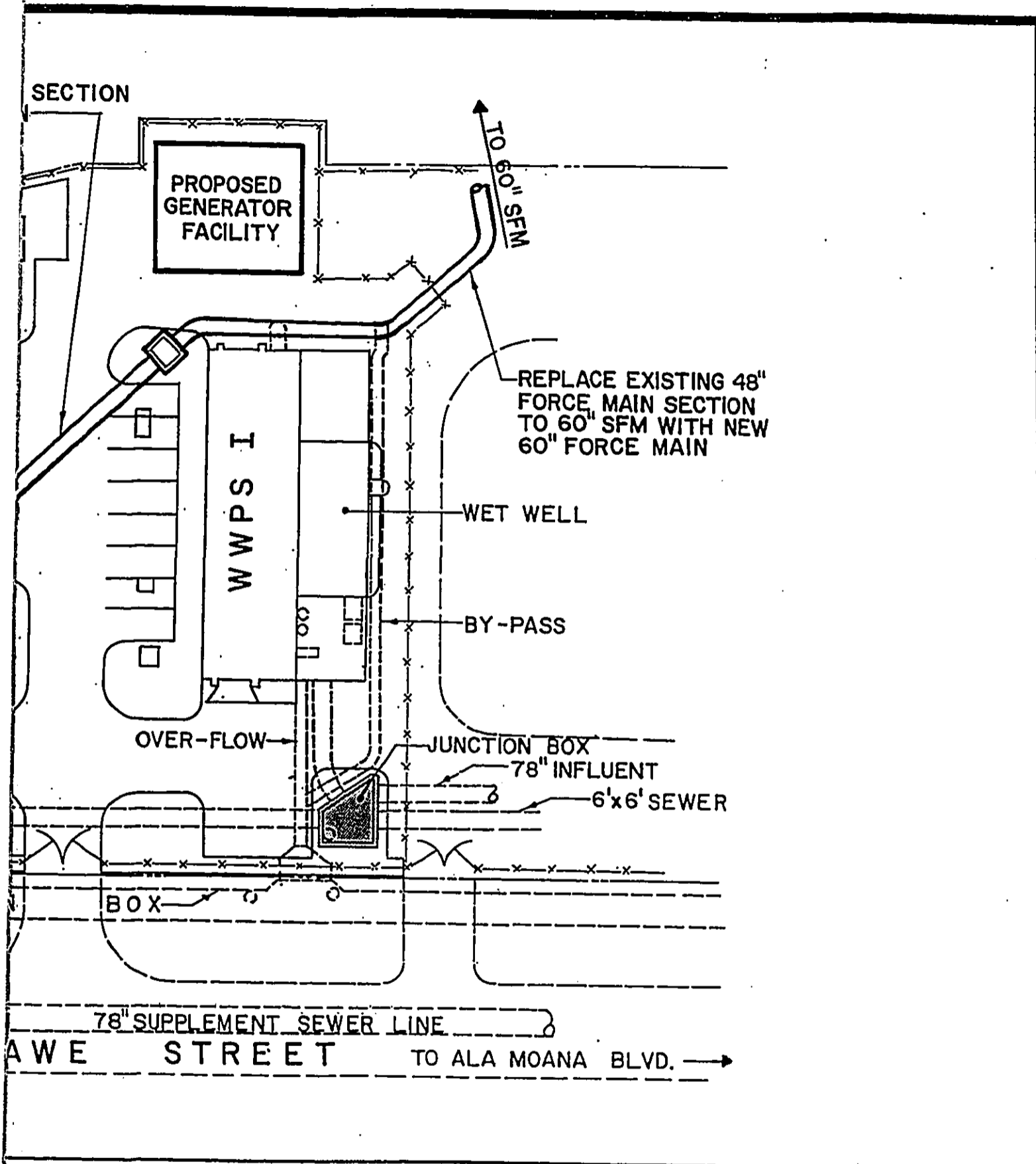
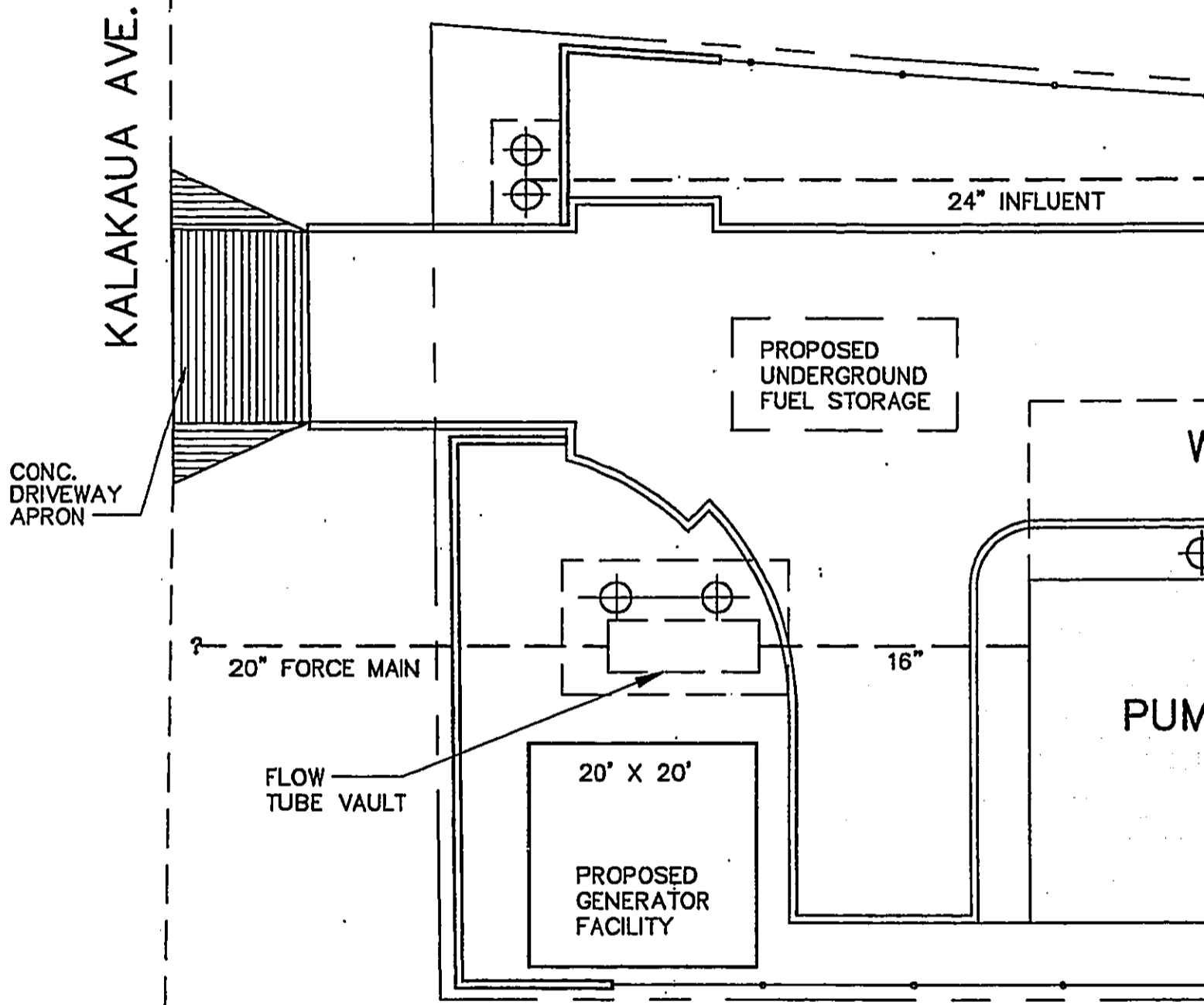


Figure A-65
 Proposed Ala Moana Pump Station Site Plan



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
BELT COLLINS HAWAII • DECEMBER 1993

Not to Scale



North

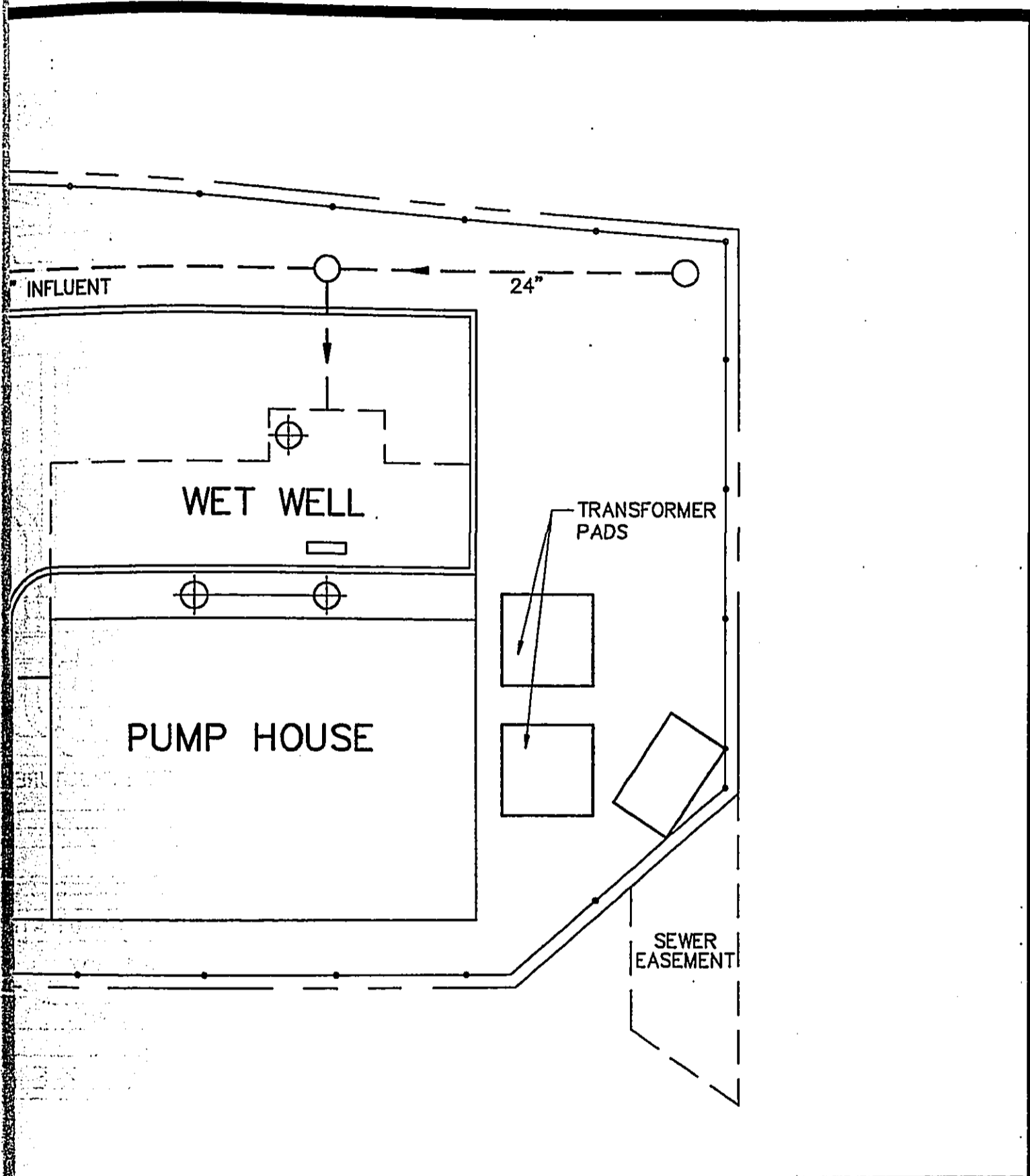


Figure A-66
Proposed Fort DeRussy Pump Station Site Plan

HART STREET

PROPOSED HART ST.
PUMP STATION

TURBINE
GENERATOR
BLDG

VALVE BOX

NIMITZ HIGHWAY

54" INFLUENT
SEWER FROM
WEST

FUEL STORAGE
TANK

54" INFLUENT
SEWER FROM
EAST

G:\AUTOCAD\MAMALA\PLOT\TALLS\HARTSTZ

EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
BELT COLLINS HAWAII • DECEMBER 1993

Not to Scale



North

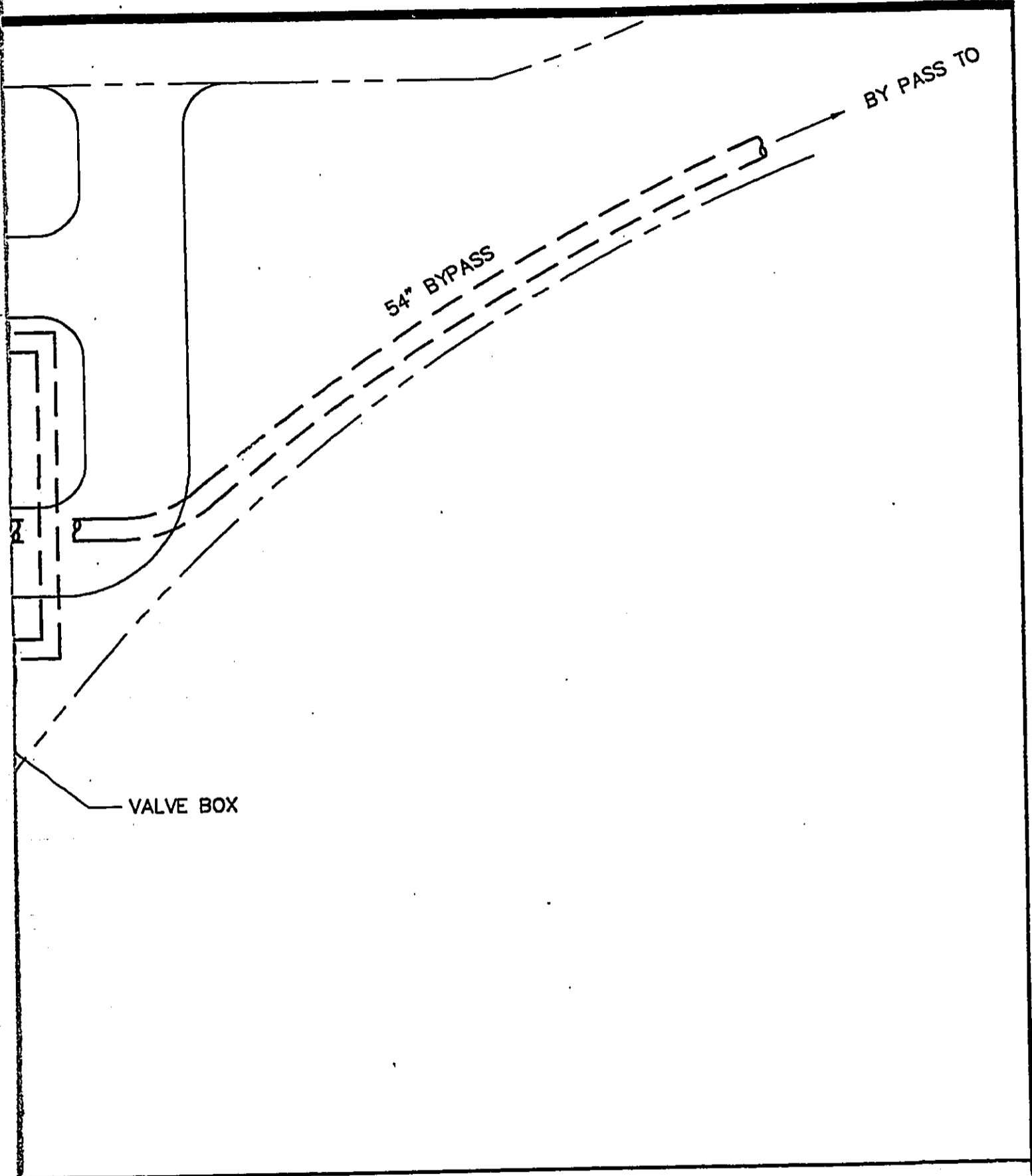
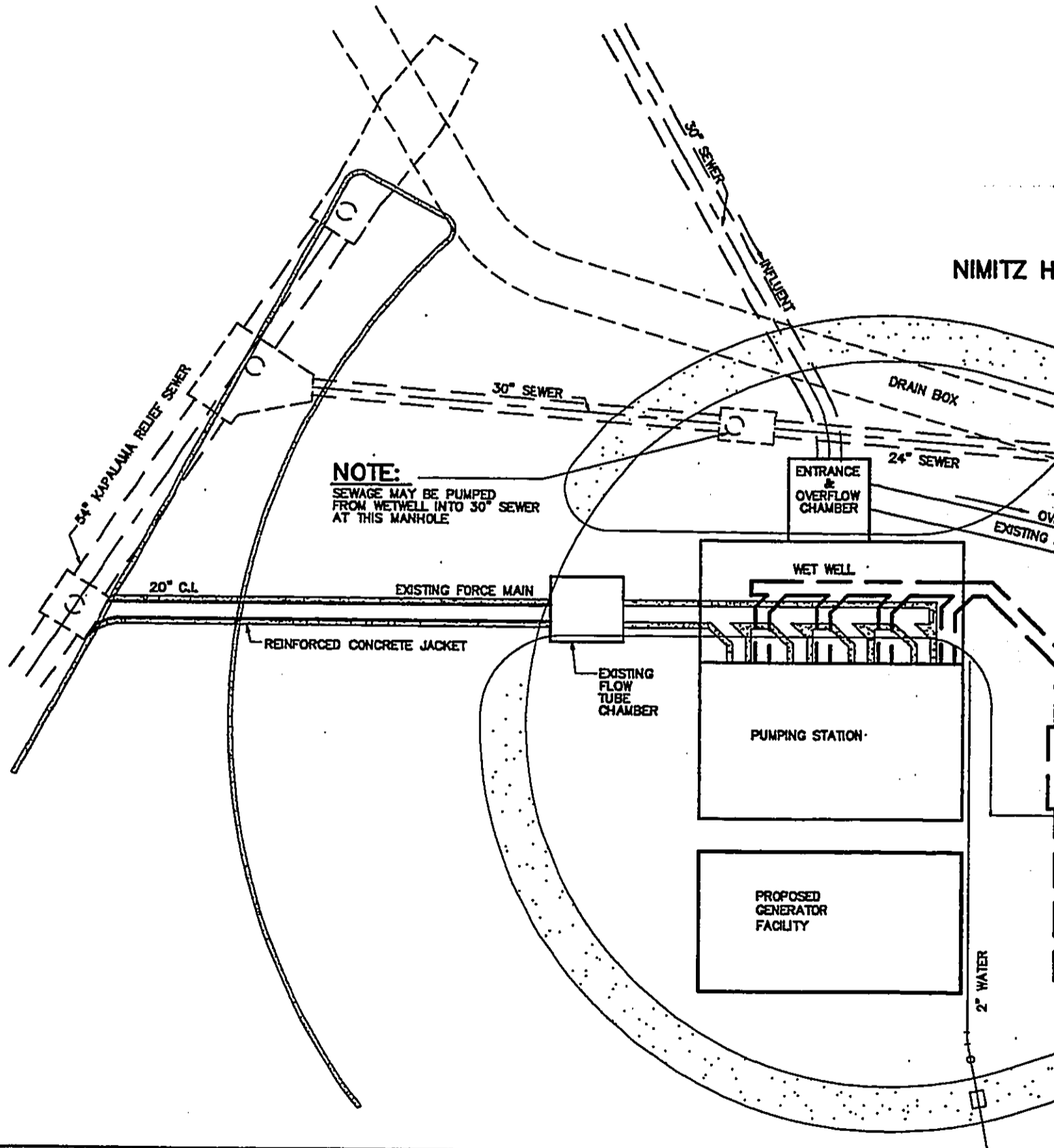


Figure A-67
Proposed Hart Street Pump Station Site Plan



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT

BELT COLLINS HAWAII • DECEMBER 1993

Not to Scale



North

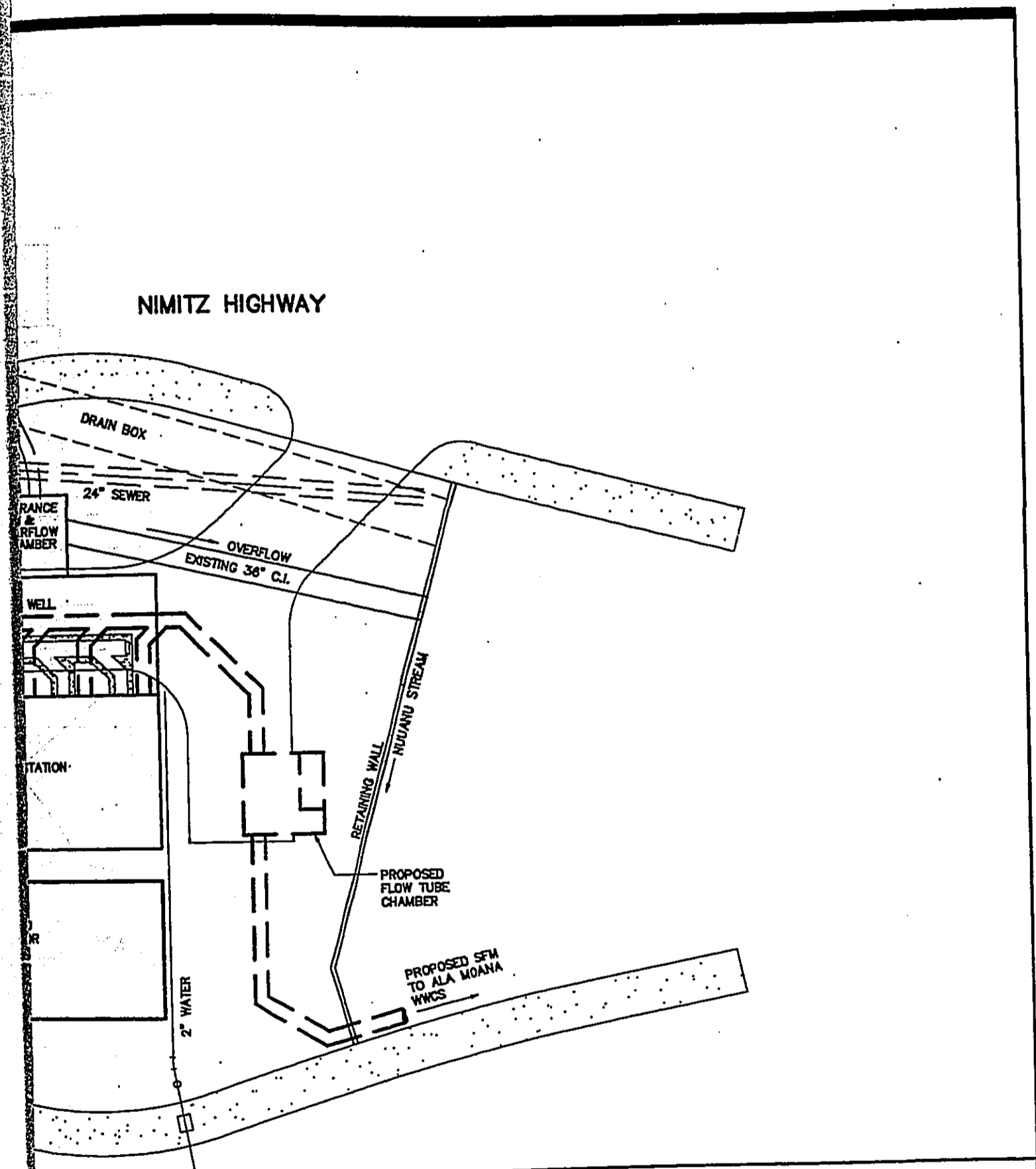
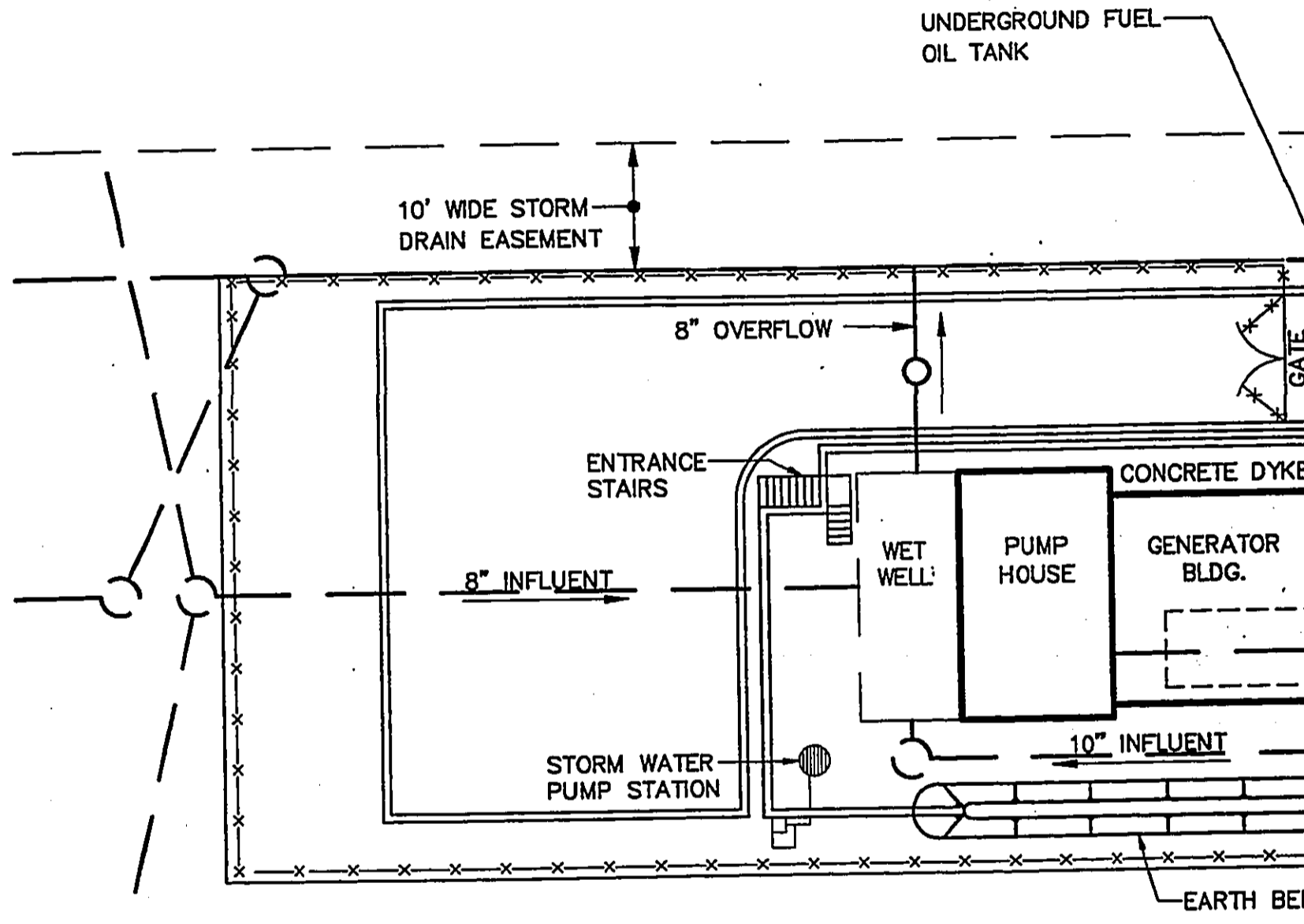


Figure A-68
 Proposed Awa Street Pump Station Site Plan



G:\AUTOCAD\MAMALA\PILOT\PILOTALLS.DWG

EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993

Not to Scale



North

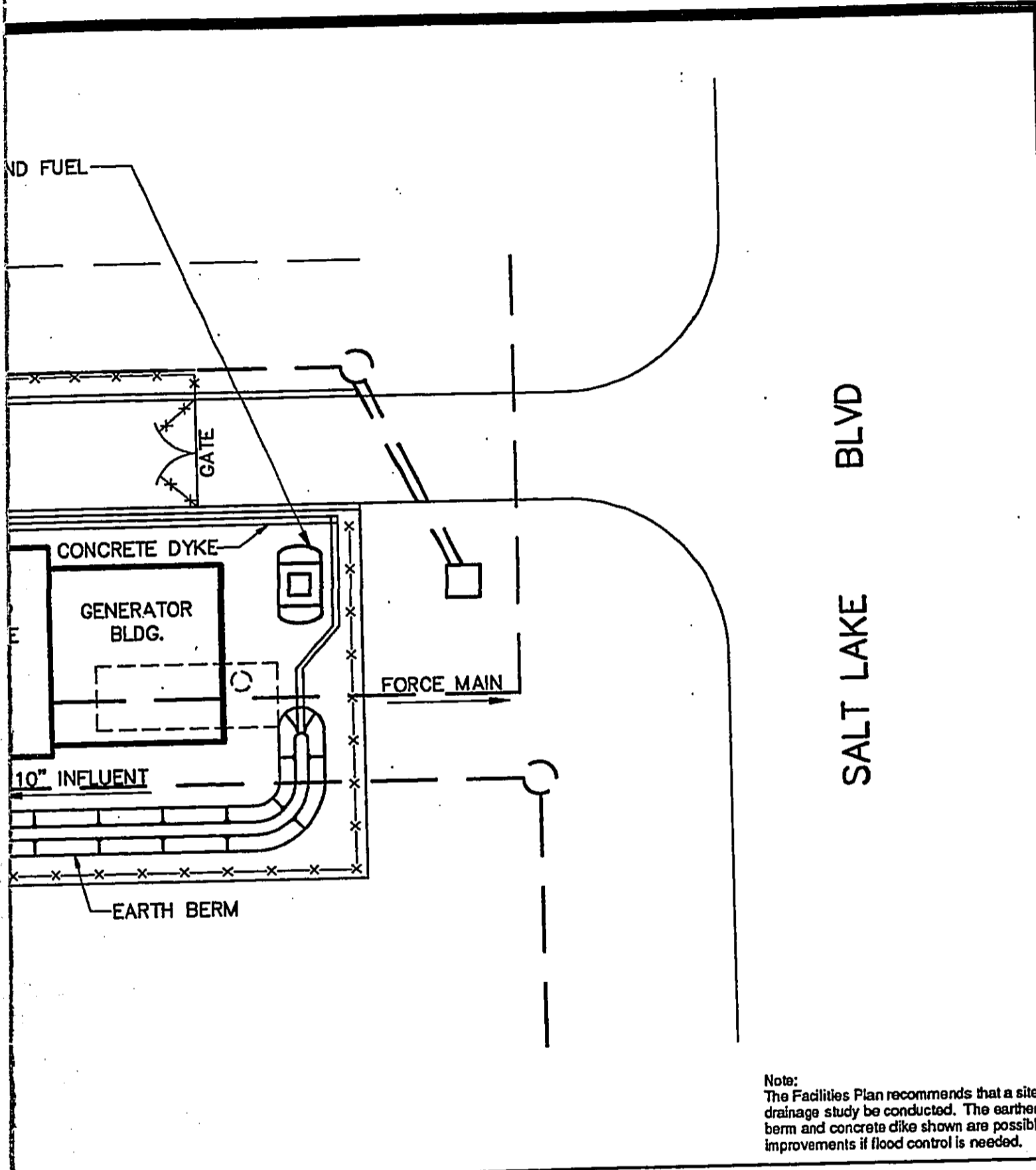
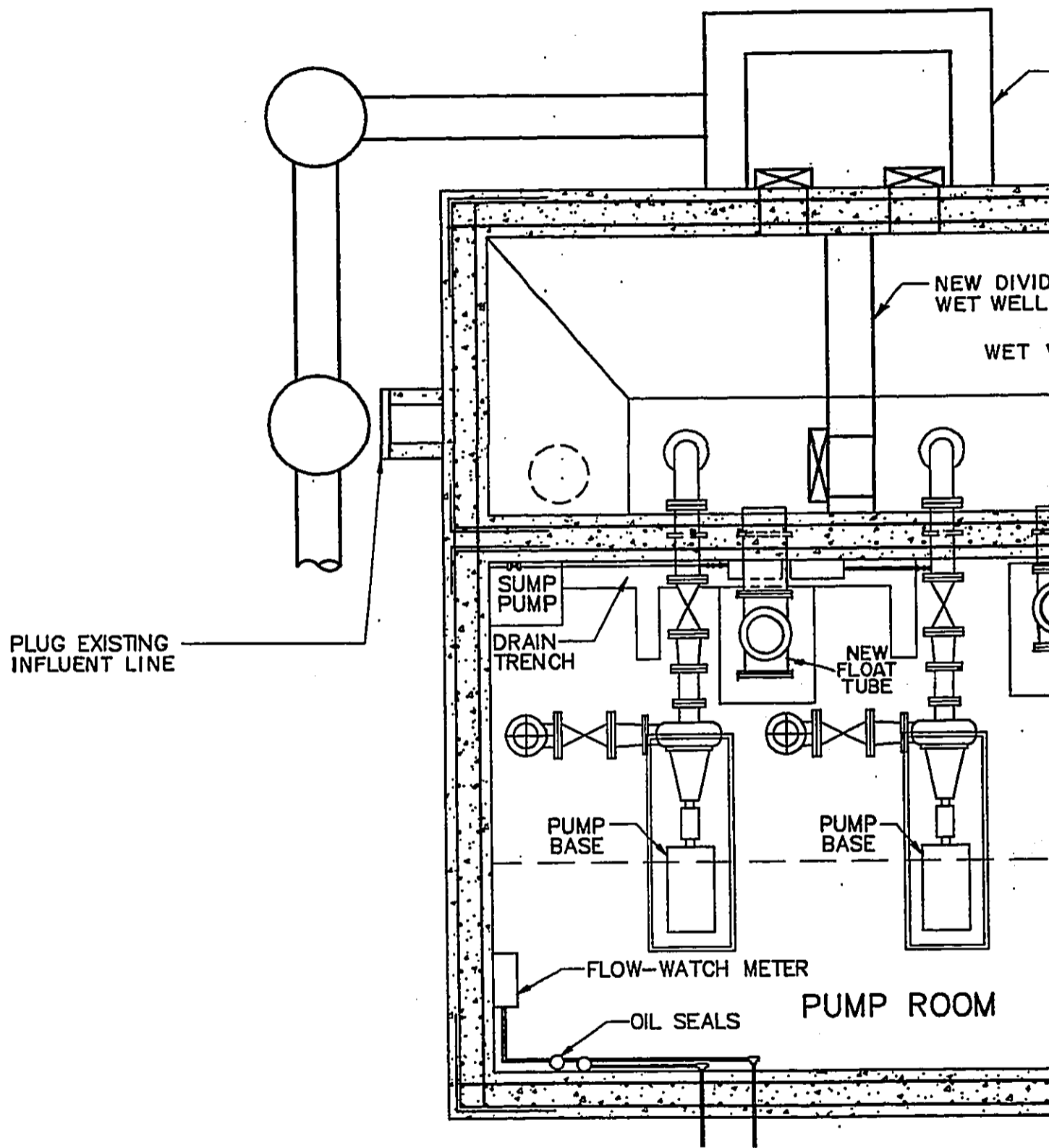


Figure A-69
Aliamanu WWPS I Site Plan with Flood Control Berm



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
BELT COLLINS HAWAII • DECEMBER 1983

Not to Scale



North

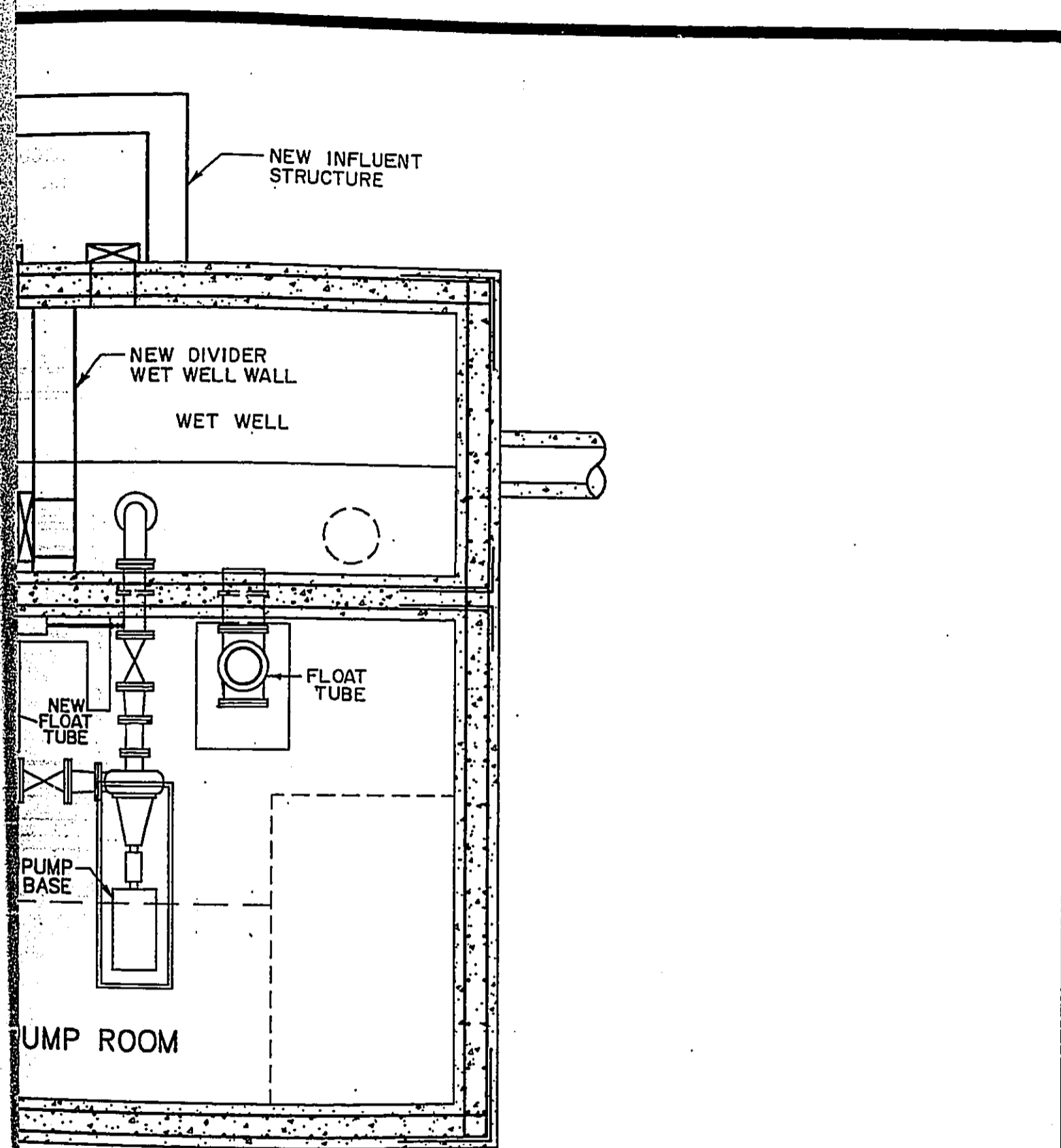
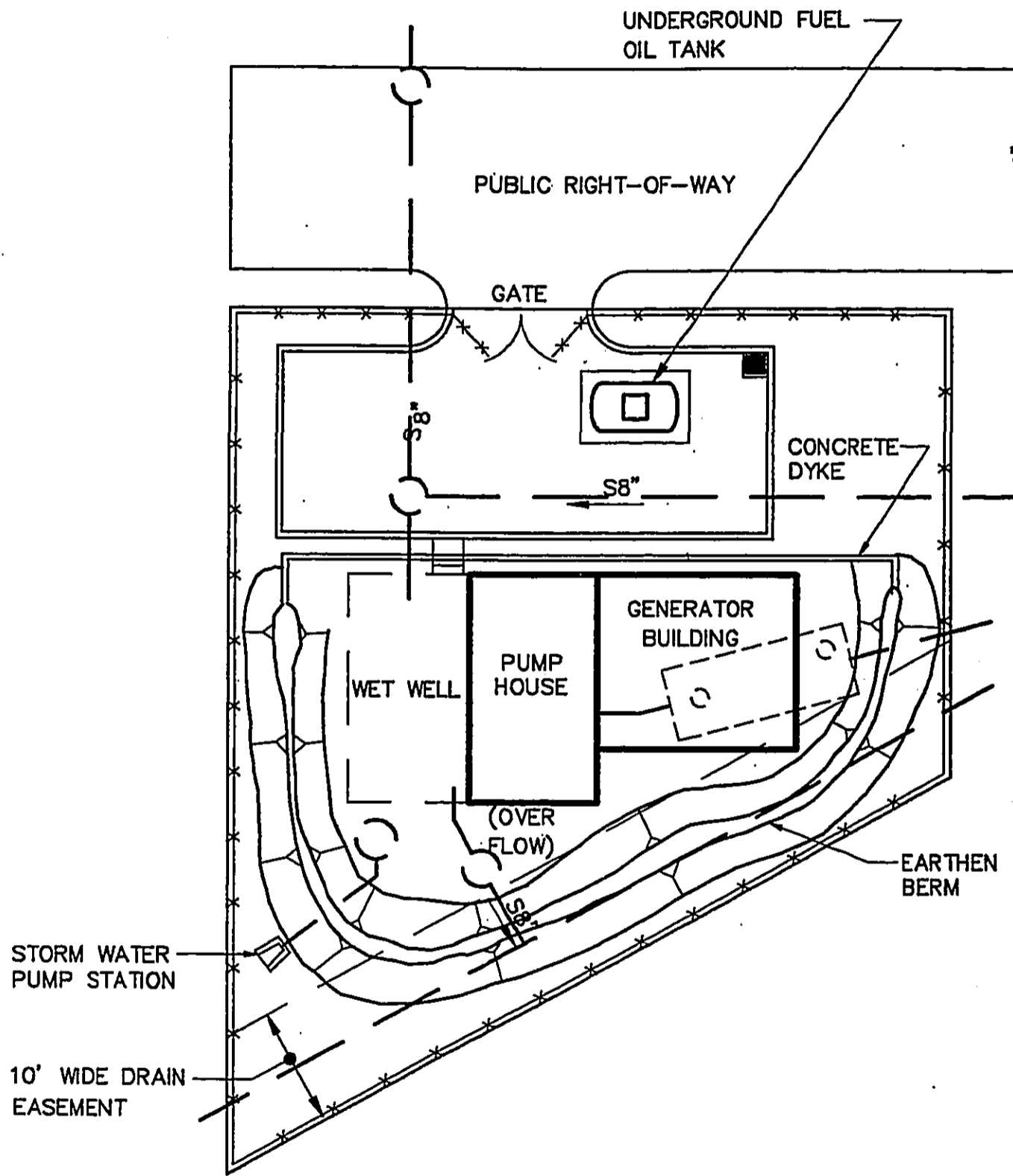


Figure A-70
Aliamanu WWPS I Floor Plan with Divided Wet Well



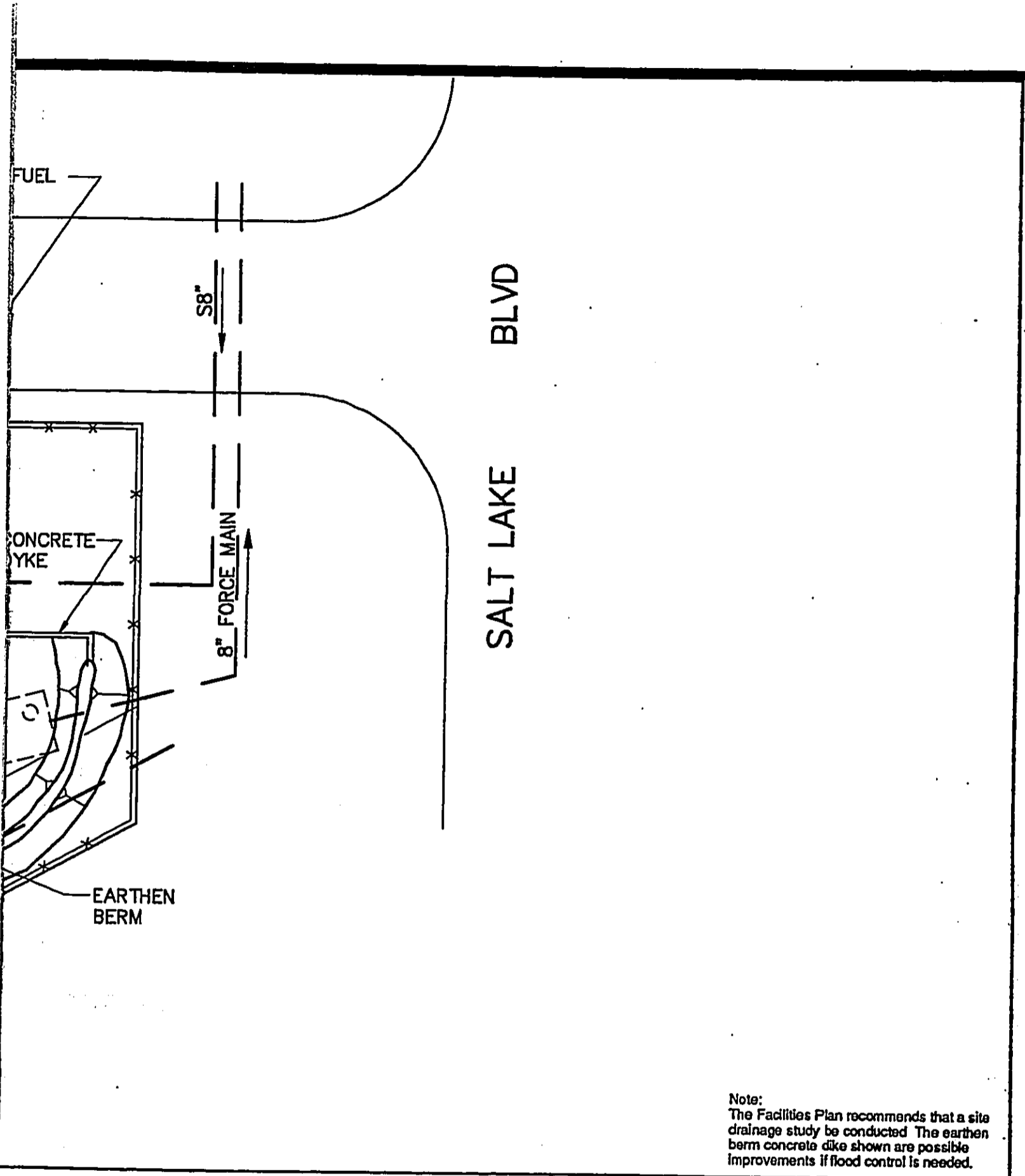
G:\AUTOCAD\MAMALA\PL01\PL0TALL2.DWG

EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993

Not to Scale



North



Note:
 The Facilities Plan recommends that a site drainage study be conducted. The earthen berm concrete dike shown are possible improvements if flood control is needed.

Figure A-71
 Aliamanu WWPS II Site Plan with Flood Control Berm

NEW INFLUENT
STRUCTURE

NEW WET WELL
DIVIDER WALL

WET WELL

SUMP
PUMP

DRAIN
TRENCH

NEW
FLOAT
TUBE

FLOAT
TUBE

PUMP
BASE

PUMP
BASE

FLOW-WATCH METER

OIL SEALS

PUMP ROOM

G:\AUTOCAD\MAMALA\PILOT\TALL2.DWG

EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
BELT COLLINS HAWAII • DECEMBER 1993

Not to Scale



North

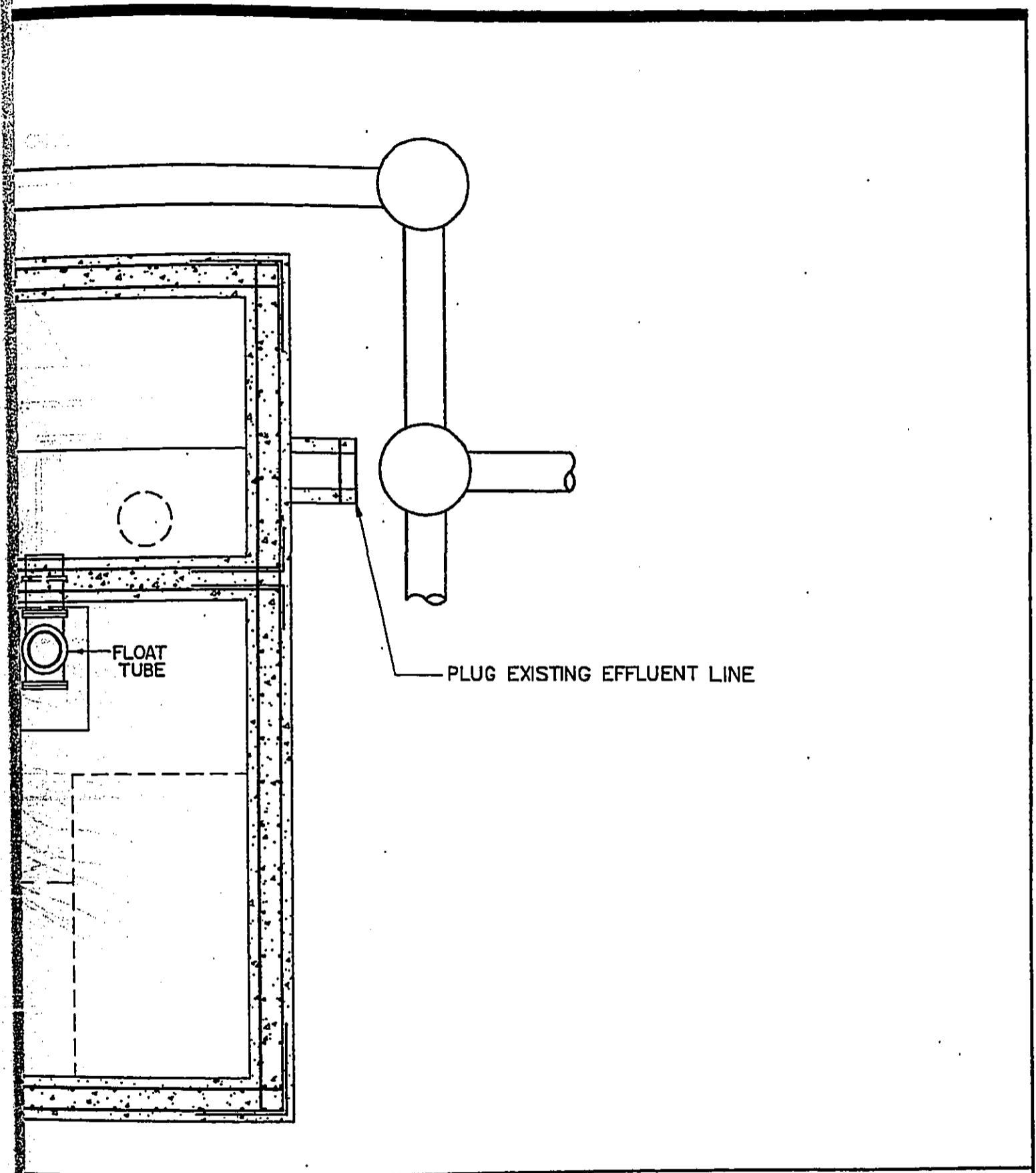
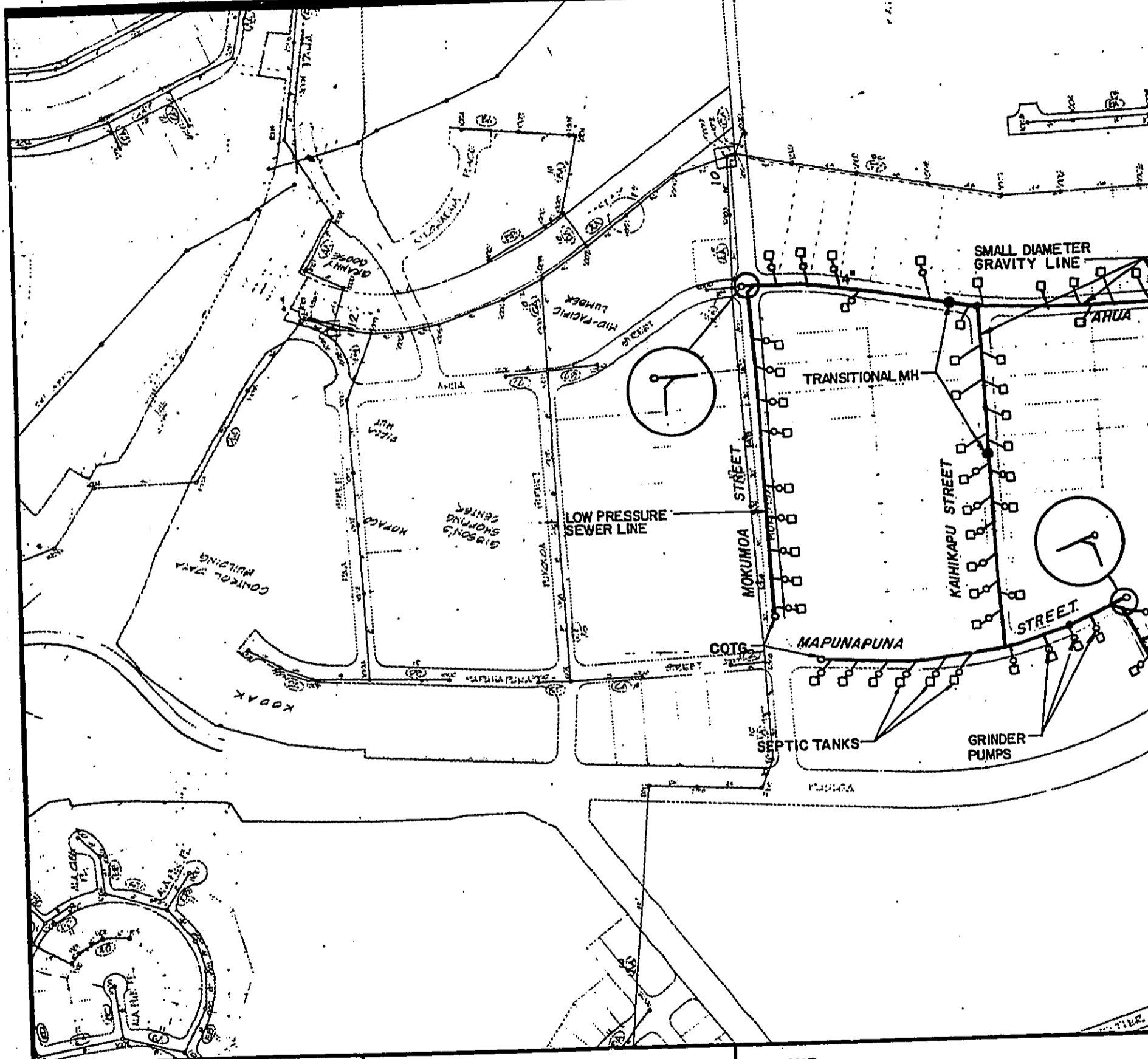
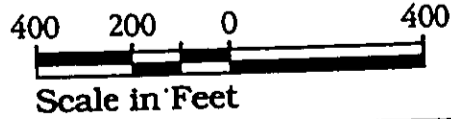


Figure A-72
Aliamanu WWPS II Floor Plan with Divided Wet Well



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



LEGEND

- — Septic Tank w/ Lateral
- — Septic Tank & Grinder Pump
- — Small Diameter Sewer w/Cleanout

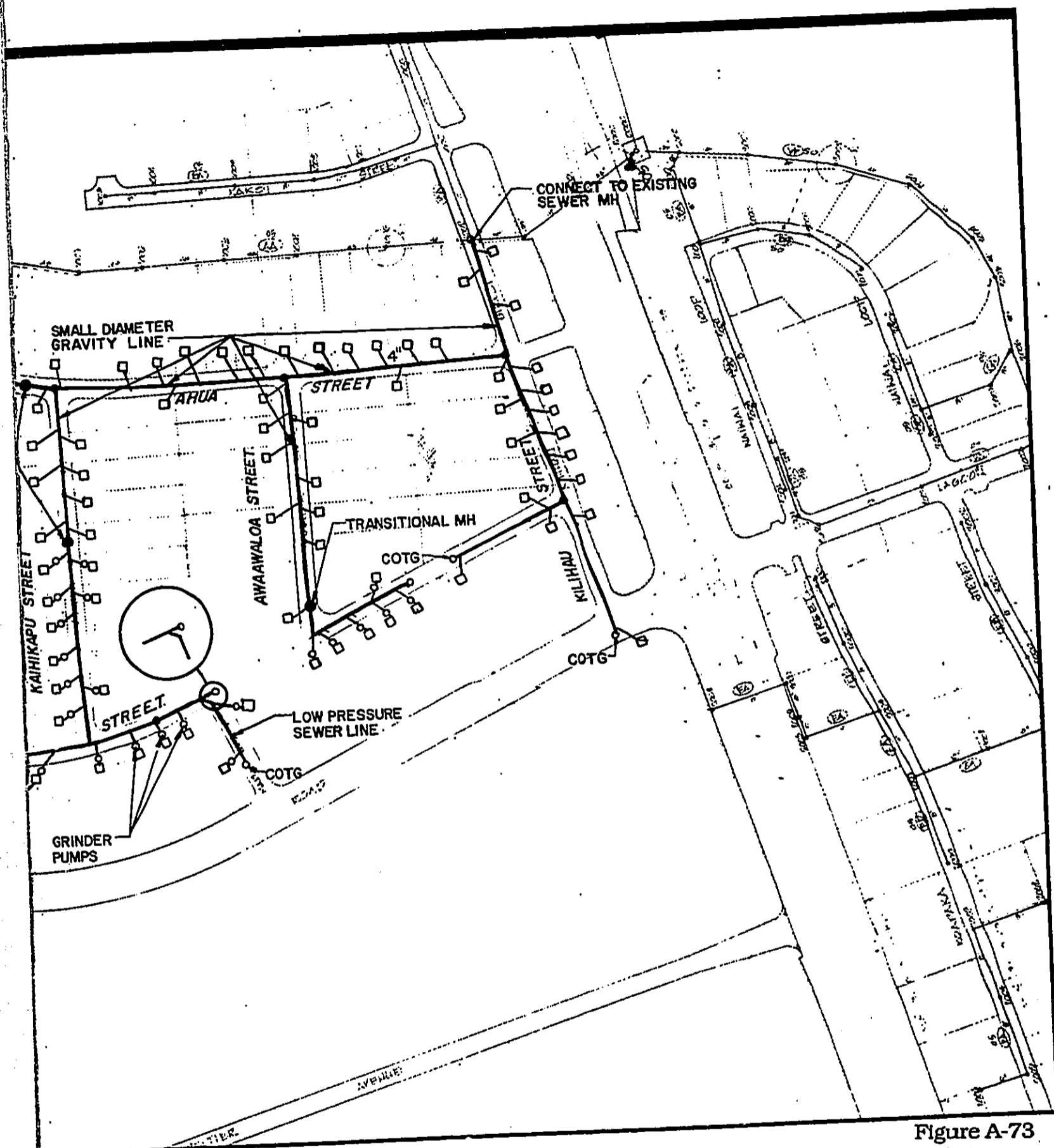
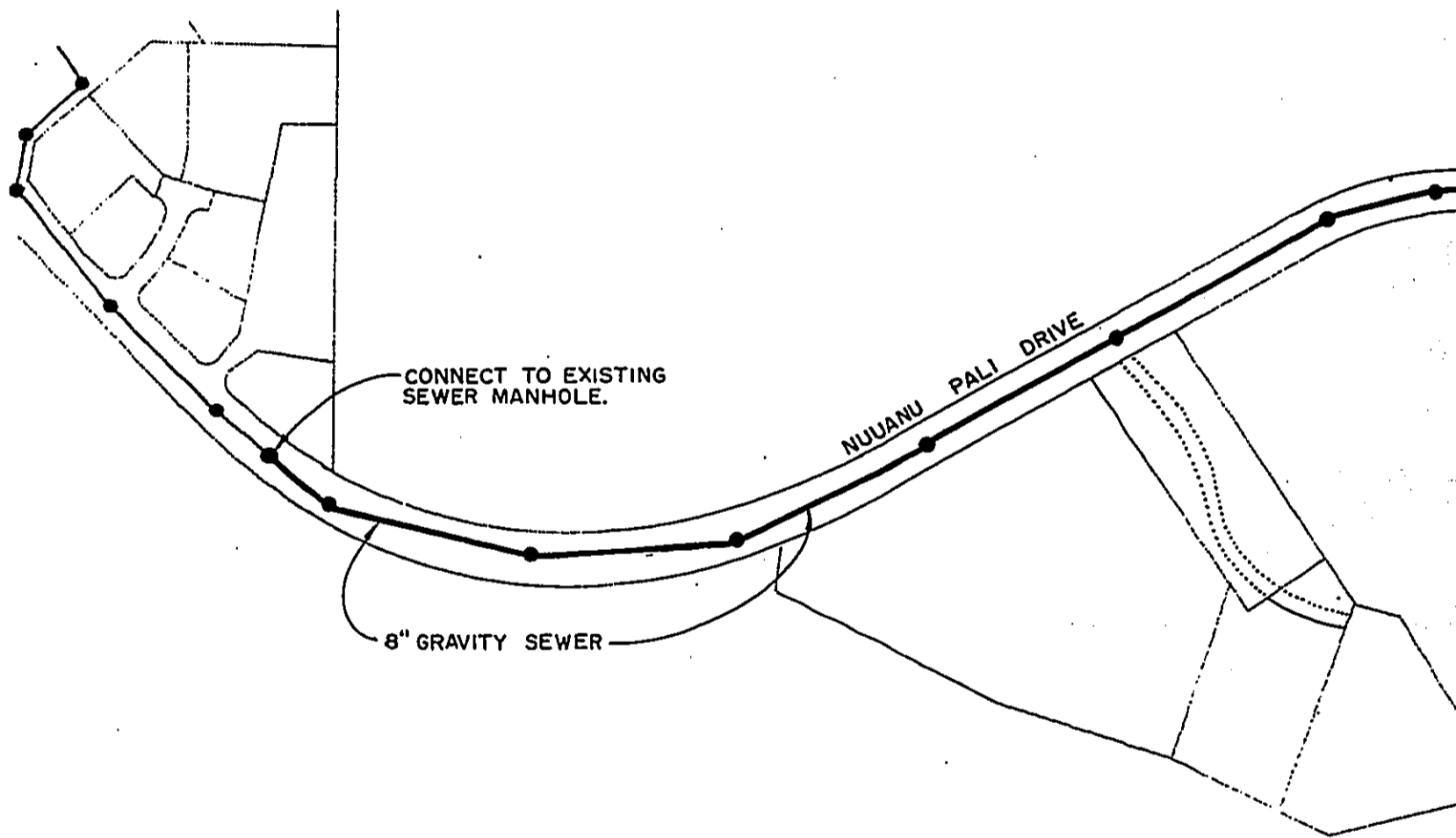


Figure A-73

Extending the Collection System into Unsewered Areas:
 Mapunapuna Industrial Area,
 Low Pressure/Small Diameter Gravity Sewerage

ump
 /Cleanout



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT

BELT COLLINS HAWAII • DECEMBER 1993

200 100 0 200



Scale in Feet



North

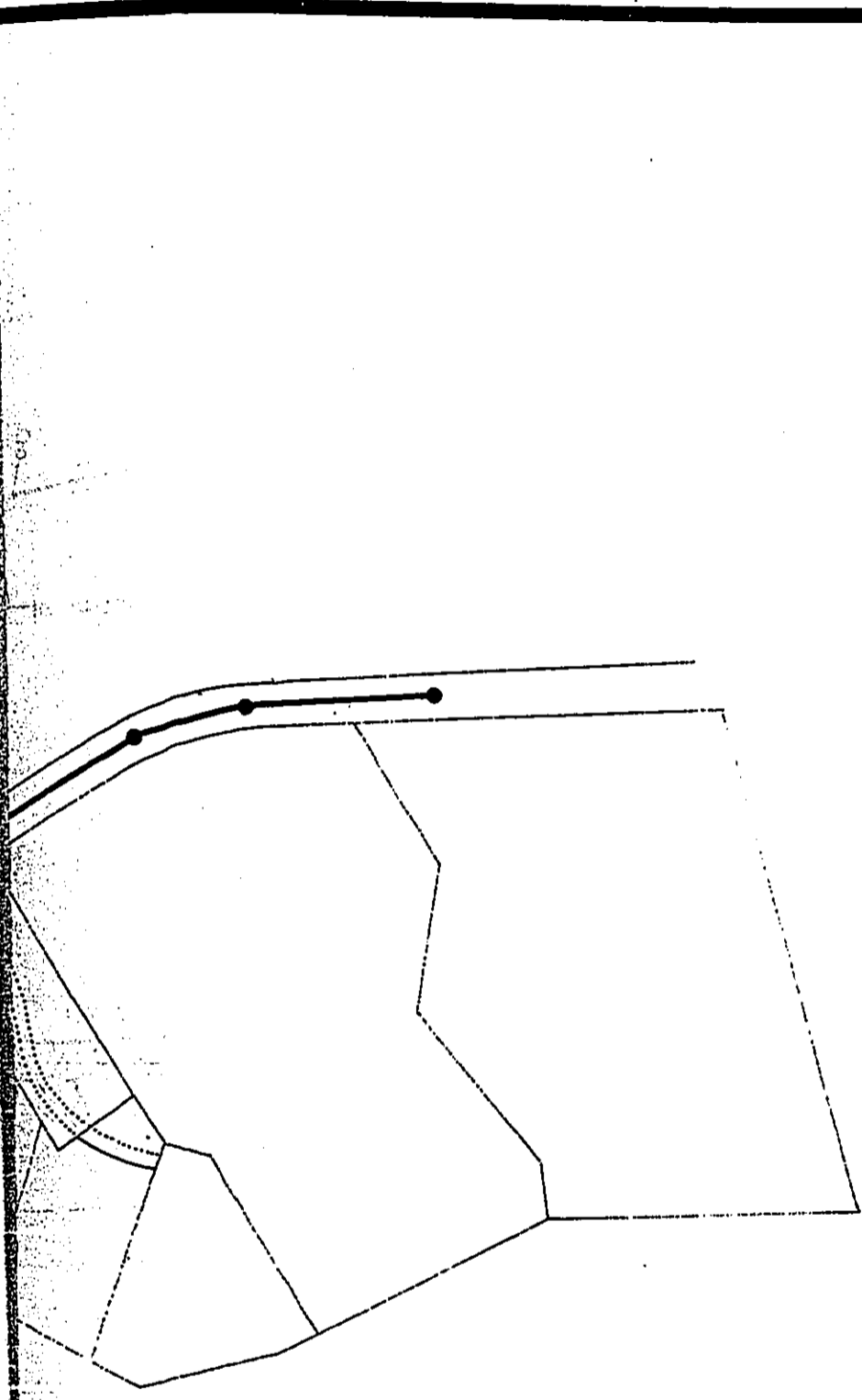
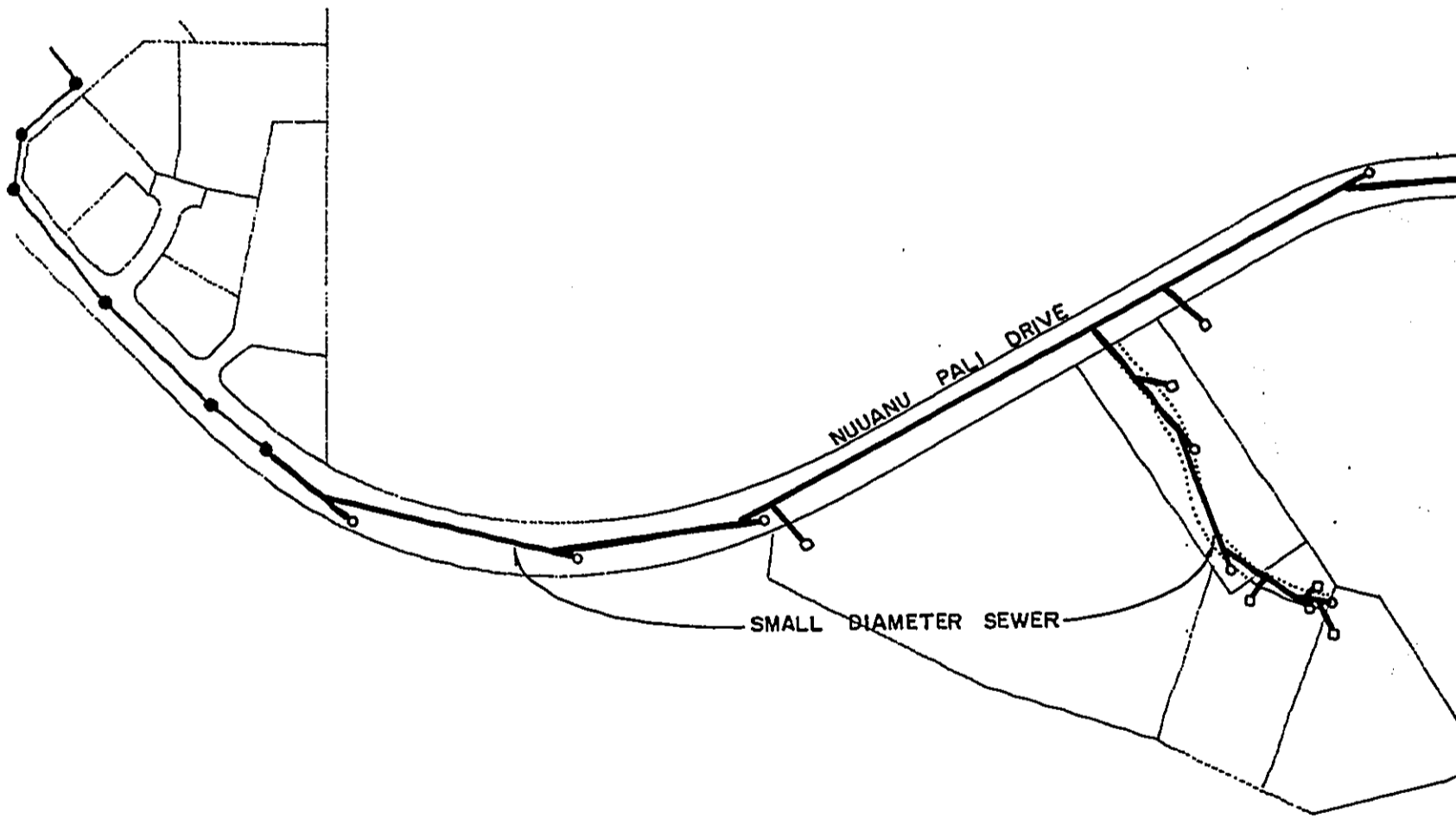


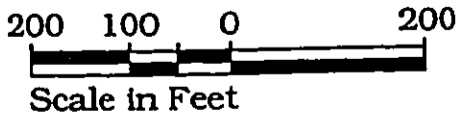
Figure A-74
Extending the Collection System into Unsewered Areas:
Nuuanu Pali Drive,
Conventional Gravity Sewerage



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT

BELT COLLINS HAWAII • DECEMBER 1993



North

LEGEND

- SEPTIC TANKS
- CLEAN OUT TO GRADE

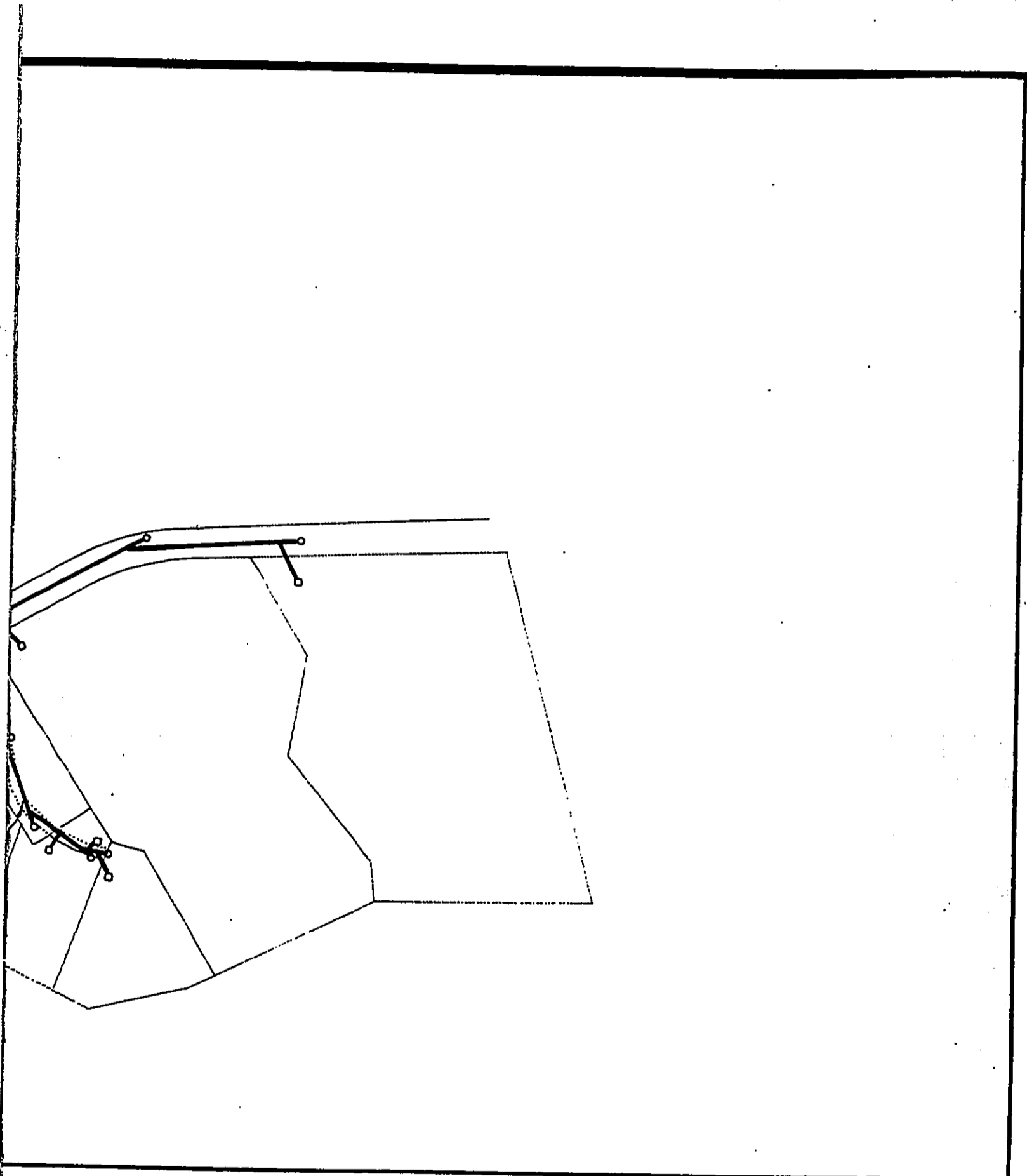
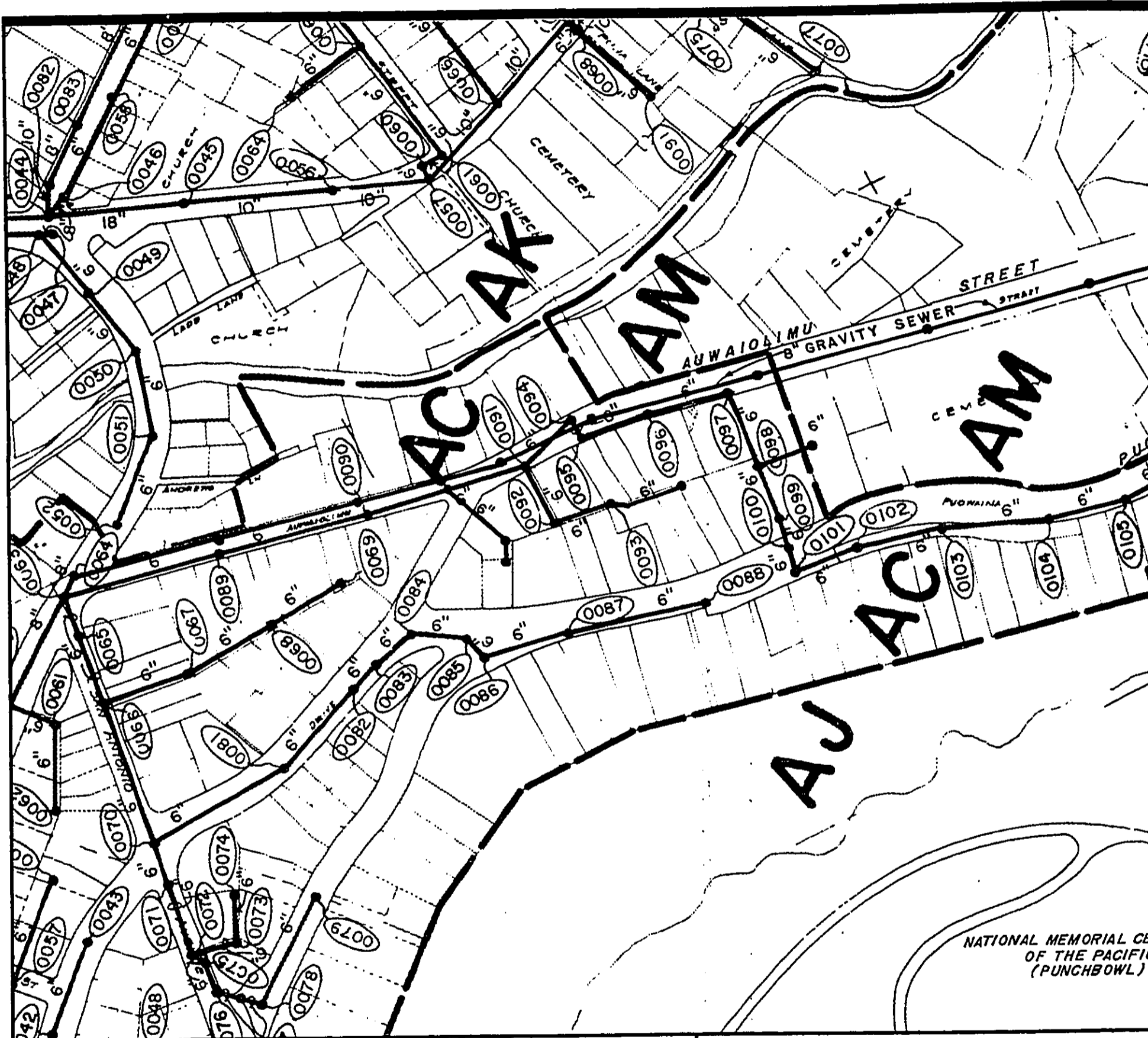
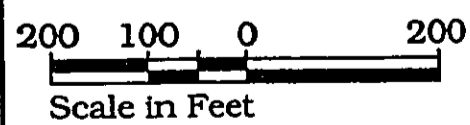


Figure A-75
Extending the Collection System into Unsewered Areas:
Nuuanu Pali Drive,
Small Diameter Gravity Sewerage



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



LEGEND:
 ● MANHOLE

Puow

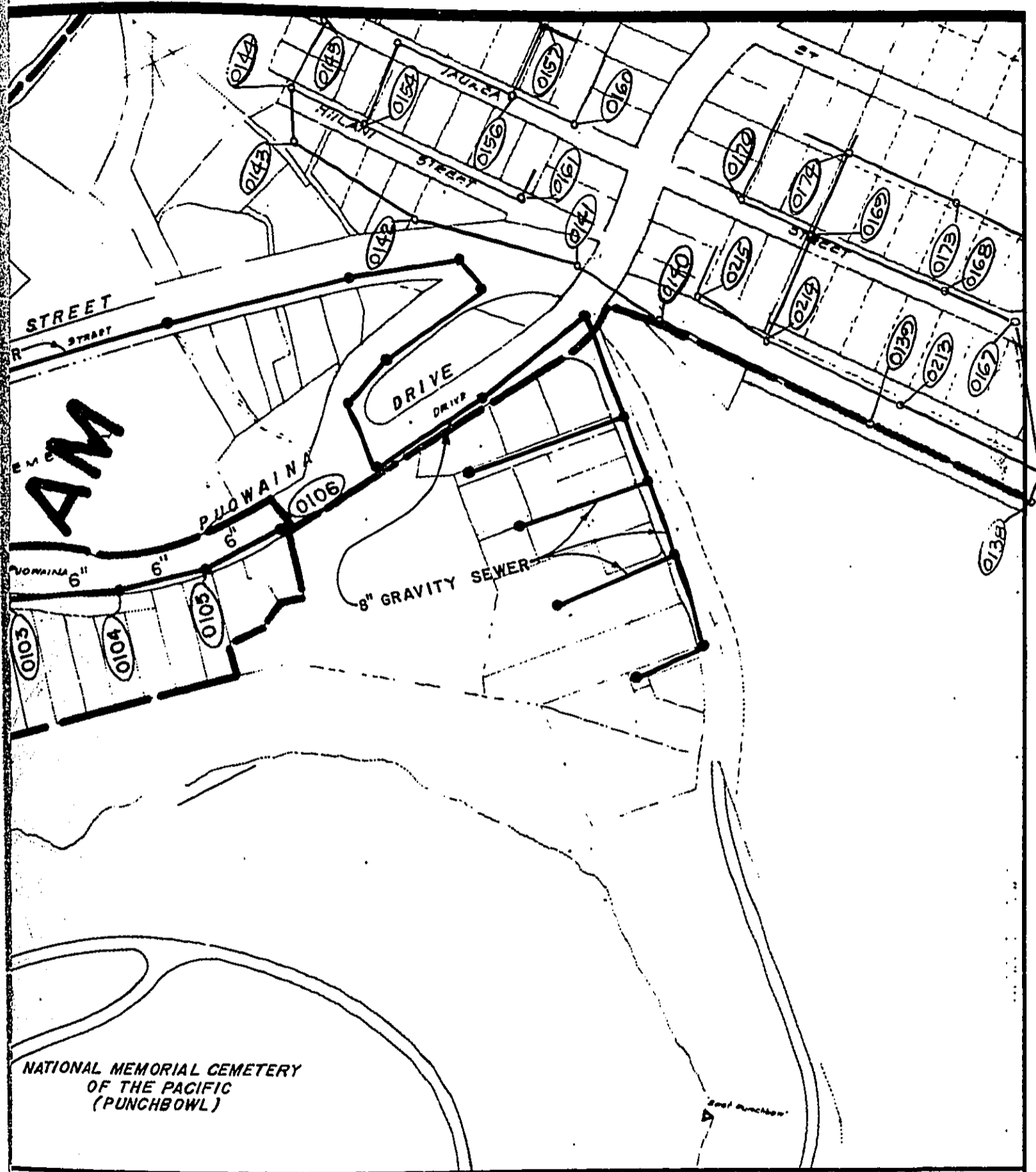
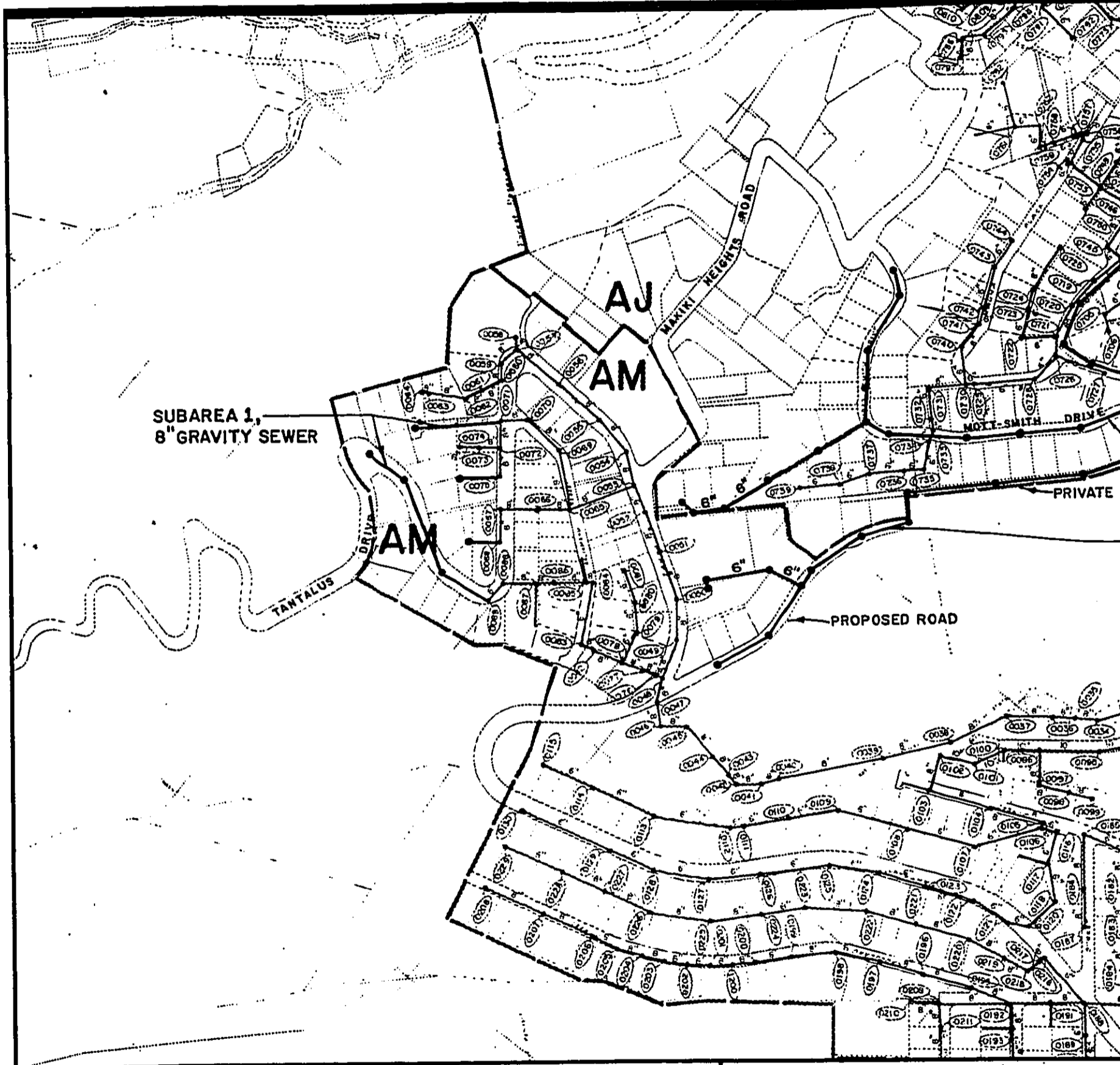


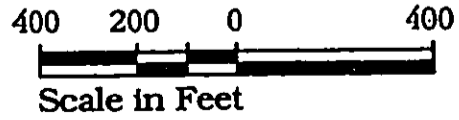
Figure A-76

**Extending the Collection System into Unsewered Areas:
Puowaina Drive, Punchbowl, Conventional Gravity Sewerage**



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



LEGEND:

● MANHOLE

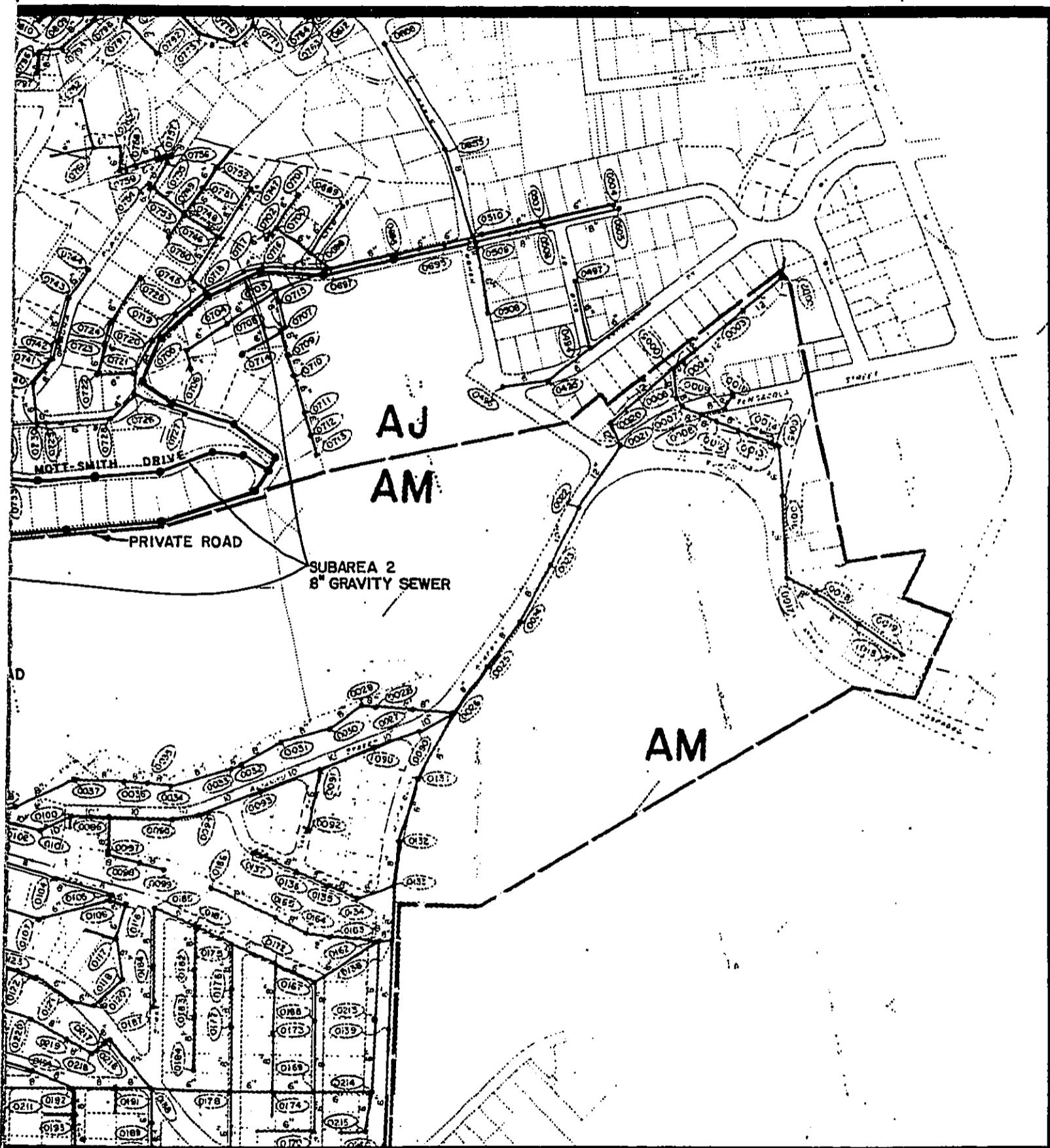
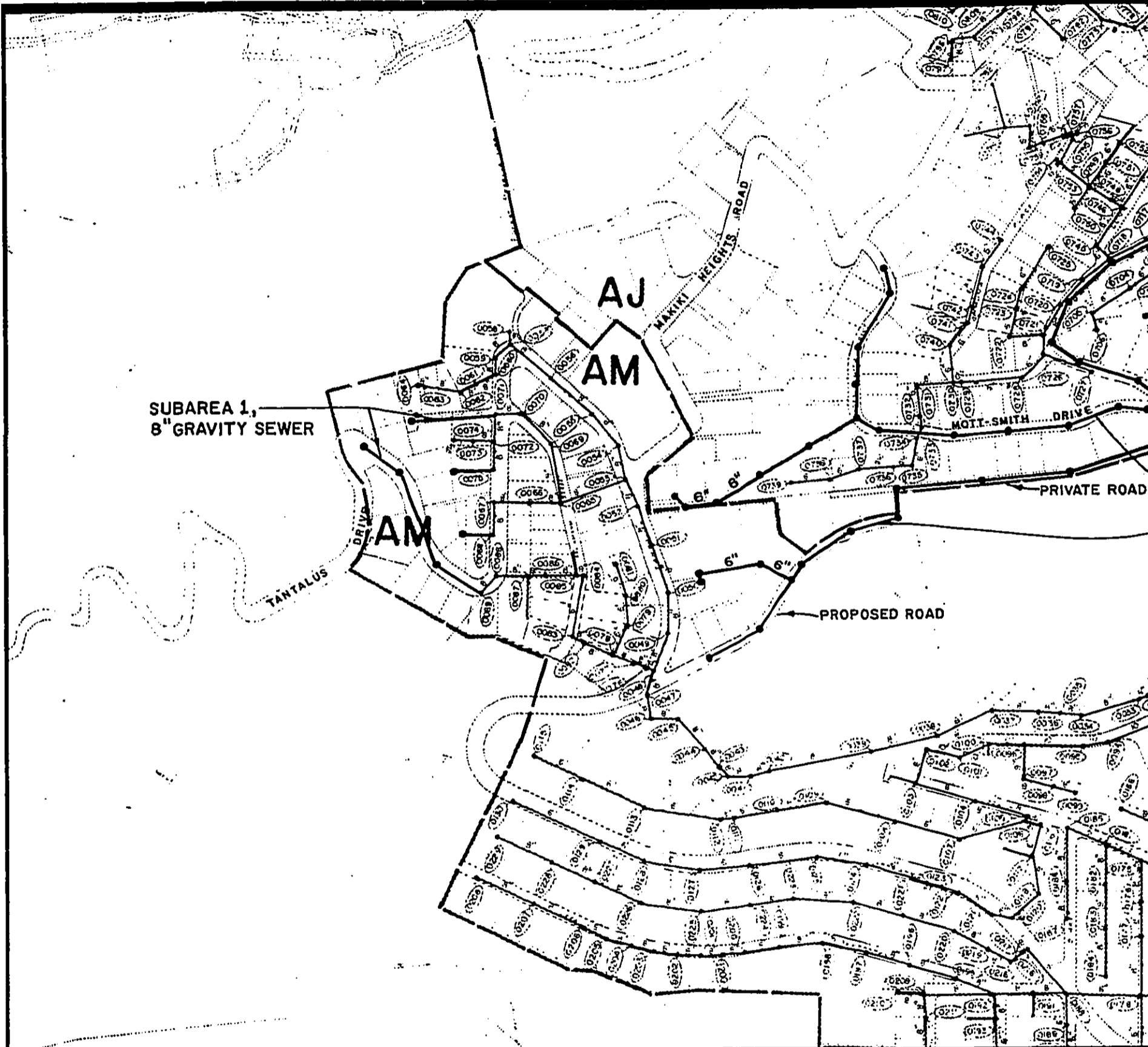


Figure A-77
 Extending the Collection System into Unsewered Areas:
 Makiki Heights-Sub-Areas 1 & 2,
 Conventional Gravity Sewerage



SUBAREA 1,
8" GRAVITY SEWER

AM

AJ

AM

TANTALUS
DRIVE

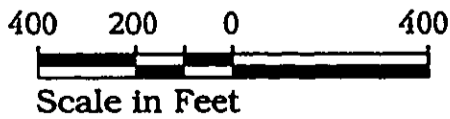
MAKIKI HEIGHTS ROAD

MOTT-SMITH DRIVE

PRIVATE ROAD

PROPOSED ROAD

EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
BELT COLLINS HAWAII • DECEMBER 1993



North

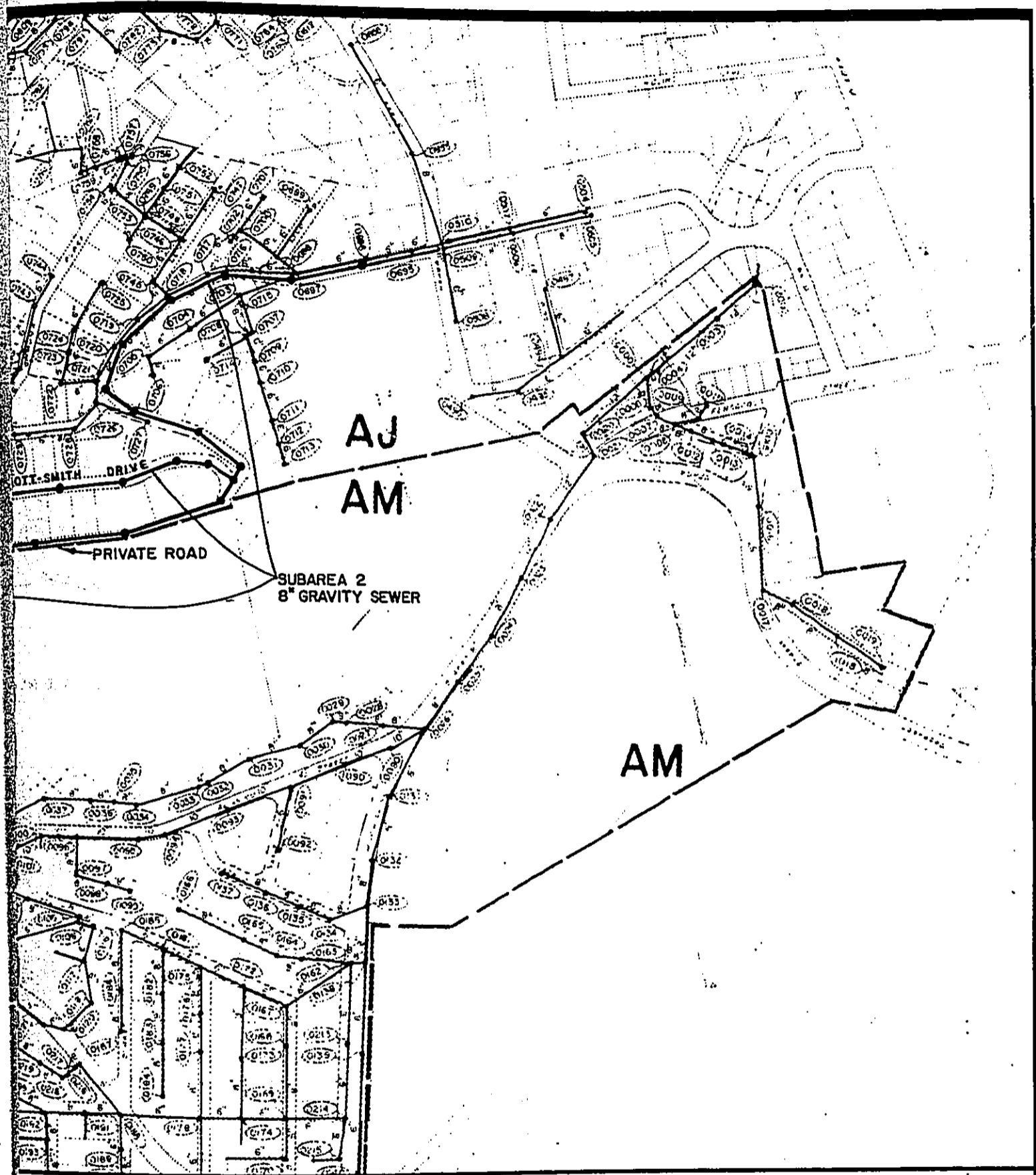
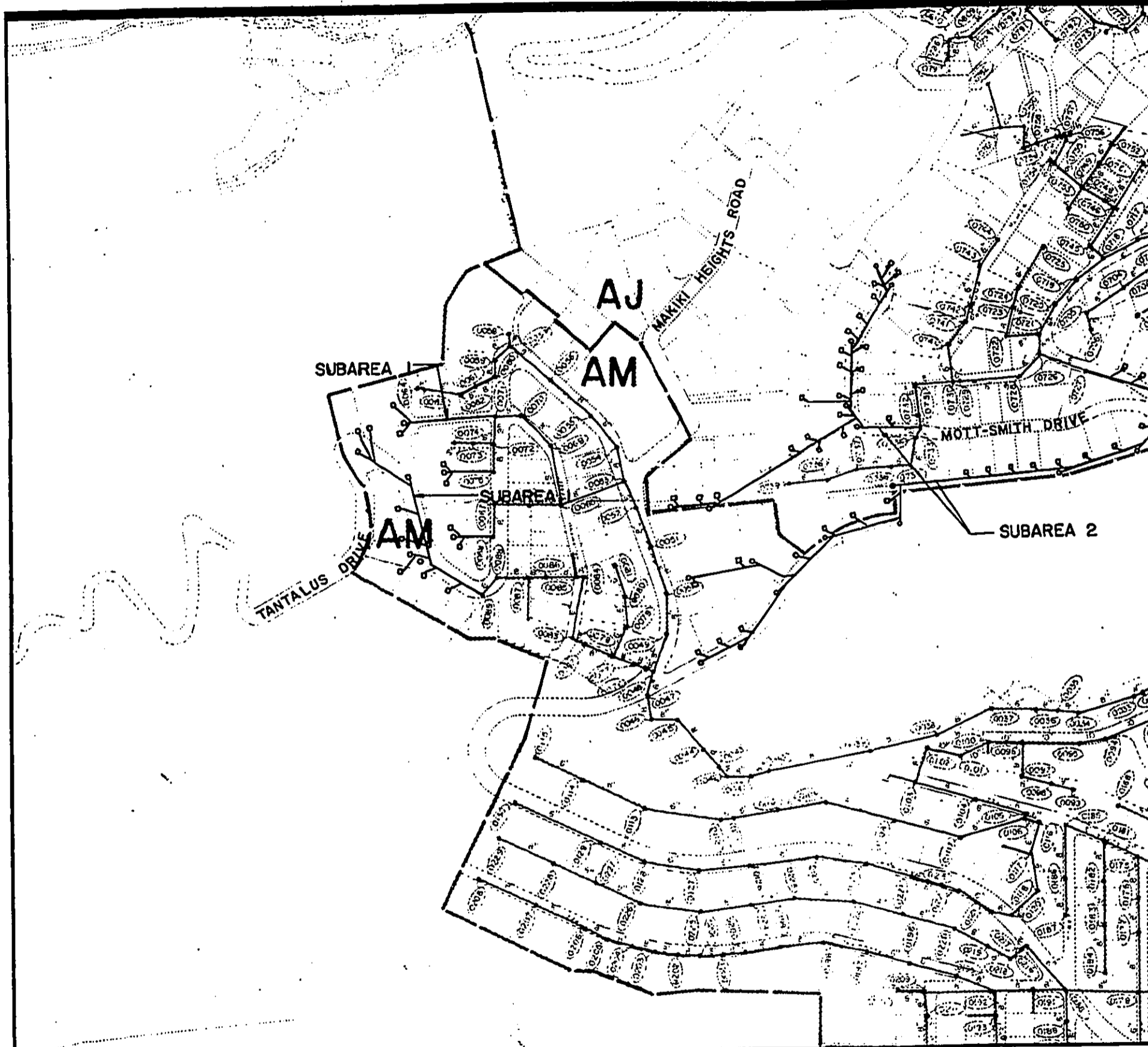
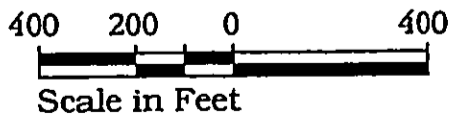


Figure A-78
 Extending the Collection System into Unsewered Areas:
 Makiki Heights - Sub-Areas 1 & 2,
 Conventional Gravity Sewerage


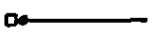
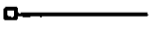



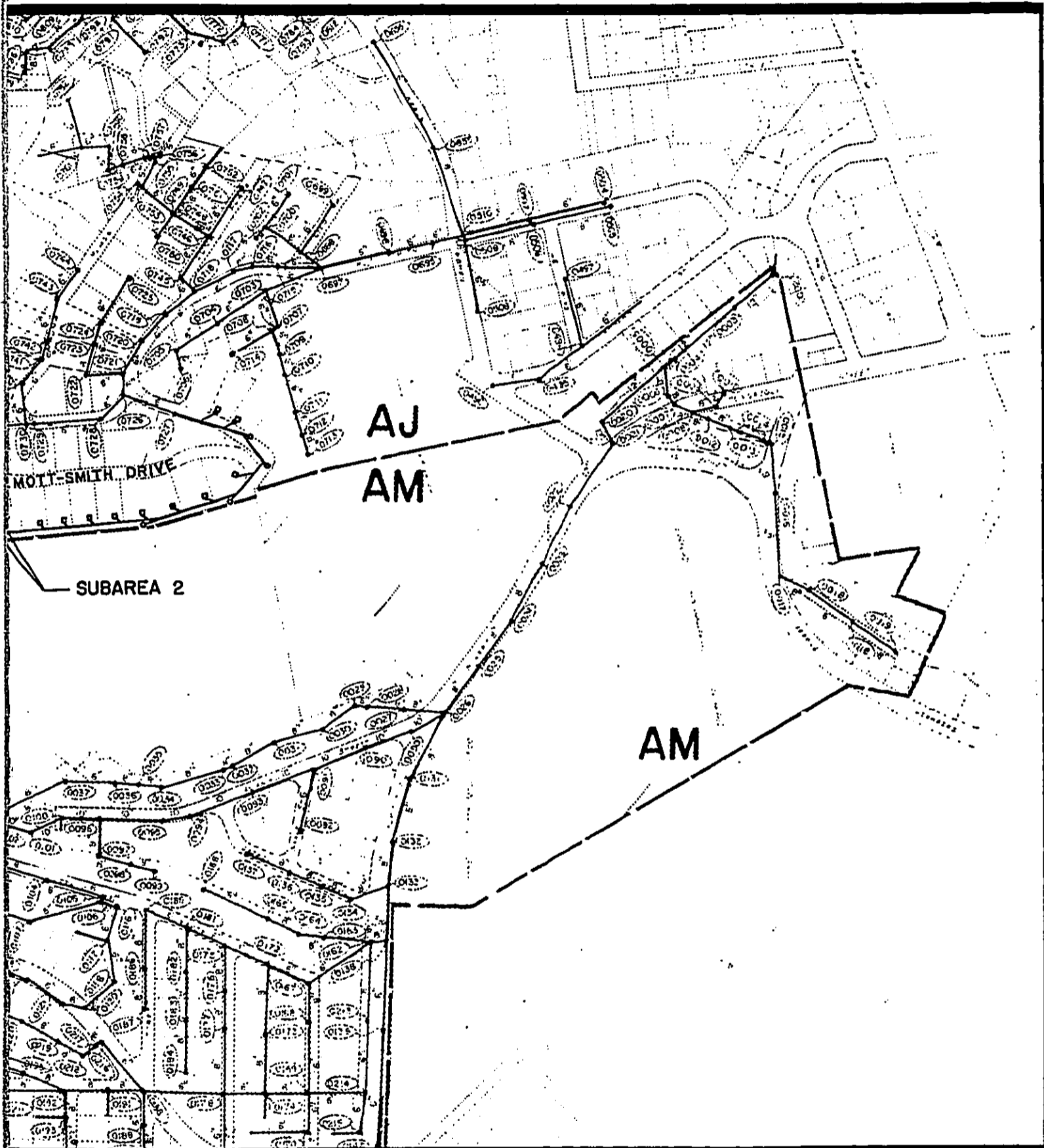
EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



North

LEGEND:

-  Small Diameter Gravity Sewer Line
-  Septic Tanks w/ Grinder Pumps
-  Septic Tanks
-  Cleanout To Grade

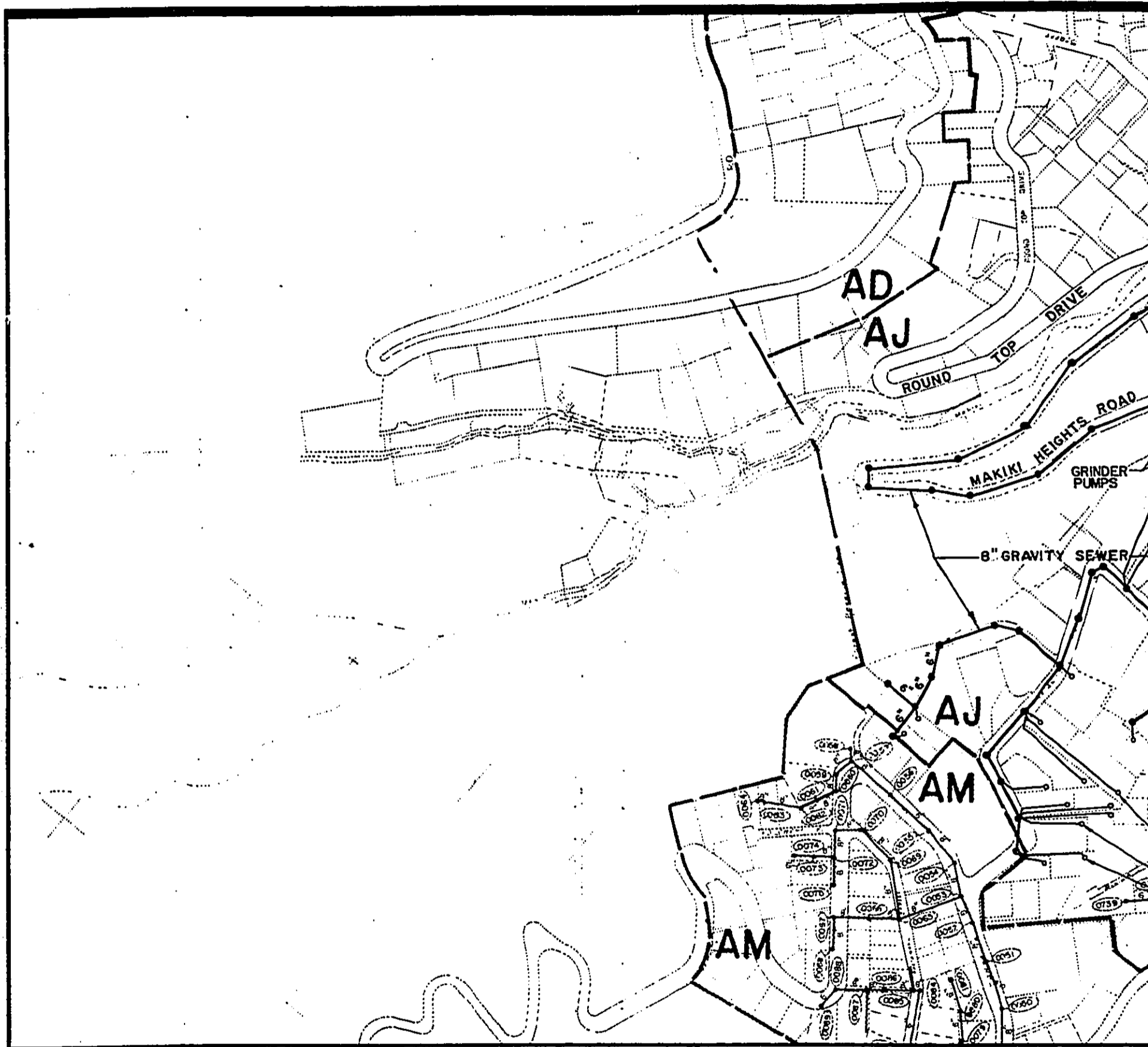


Gravity Sewer Line
Grinder Pumps

Extending the Collection System into Unsewered Areas:
Makiki Heights - Sub-Areas 1 & 2,
Small Diameter Gravity Sewerage

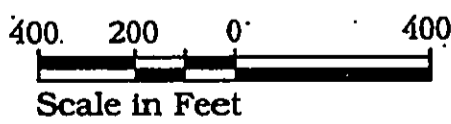
Figure A-79

1e



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



- LEGEND:**
- MANHOLE
 - GRINDER PUMP

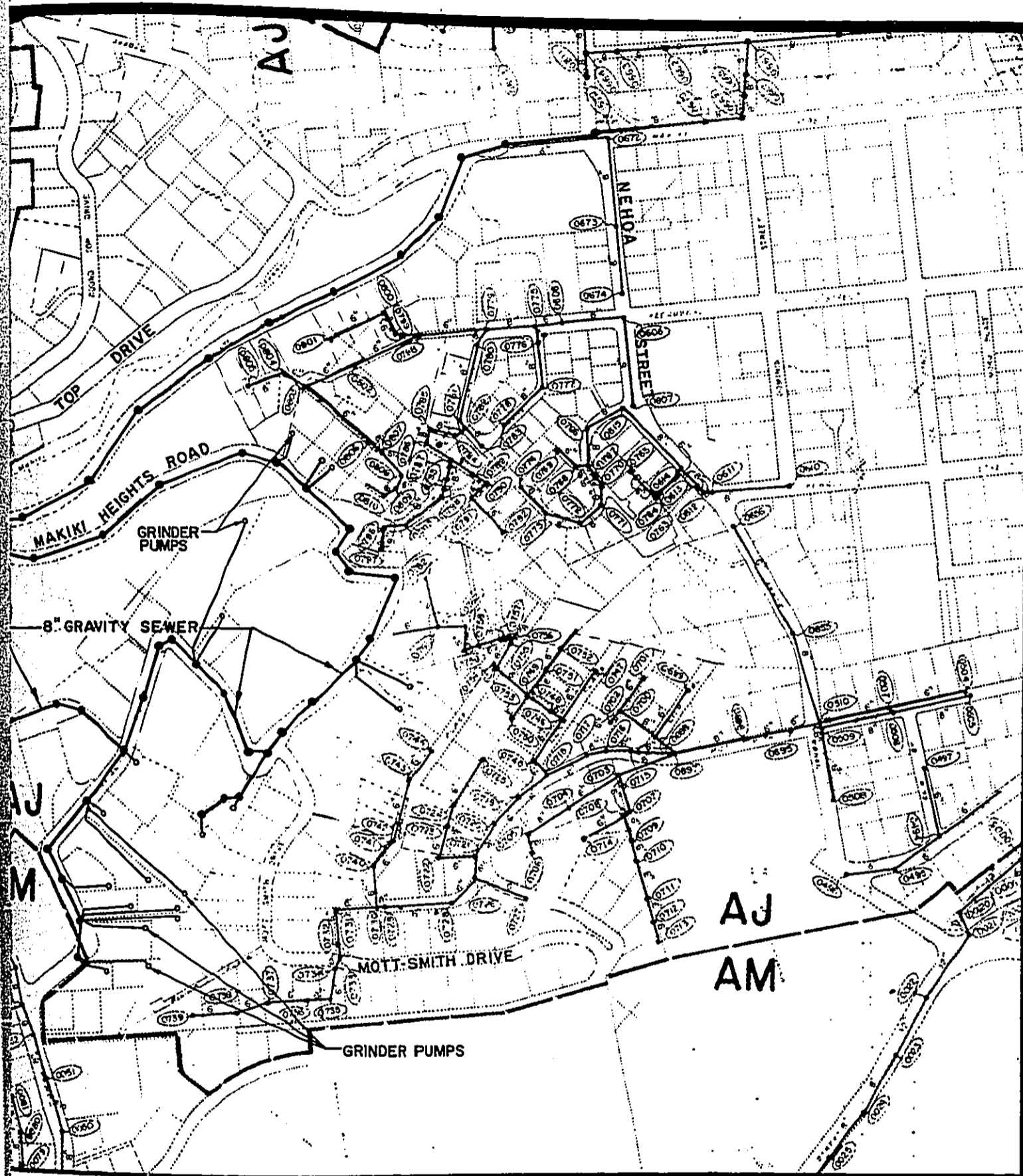
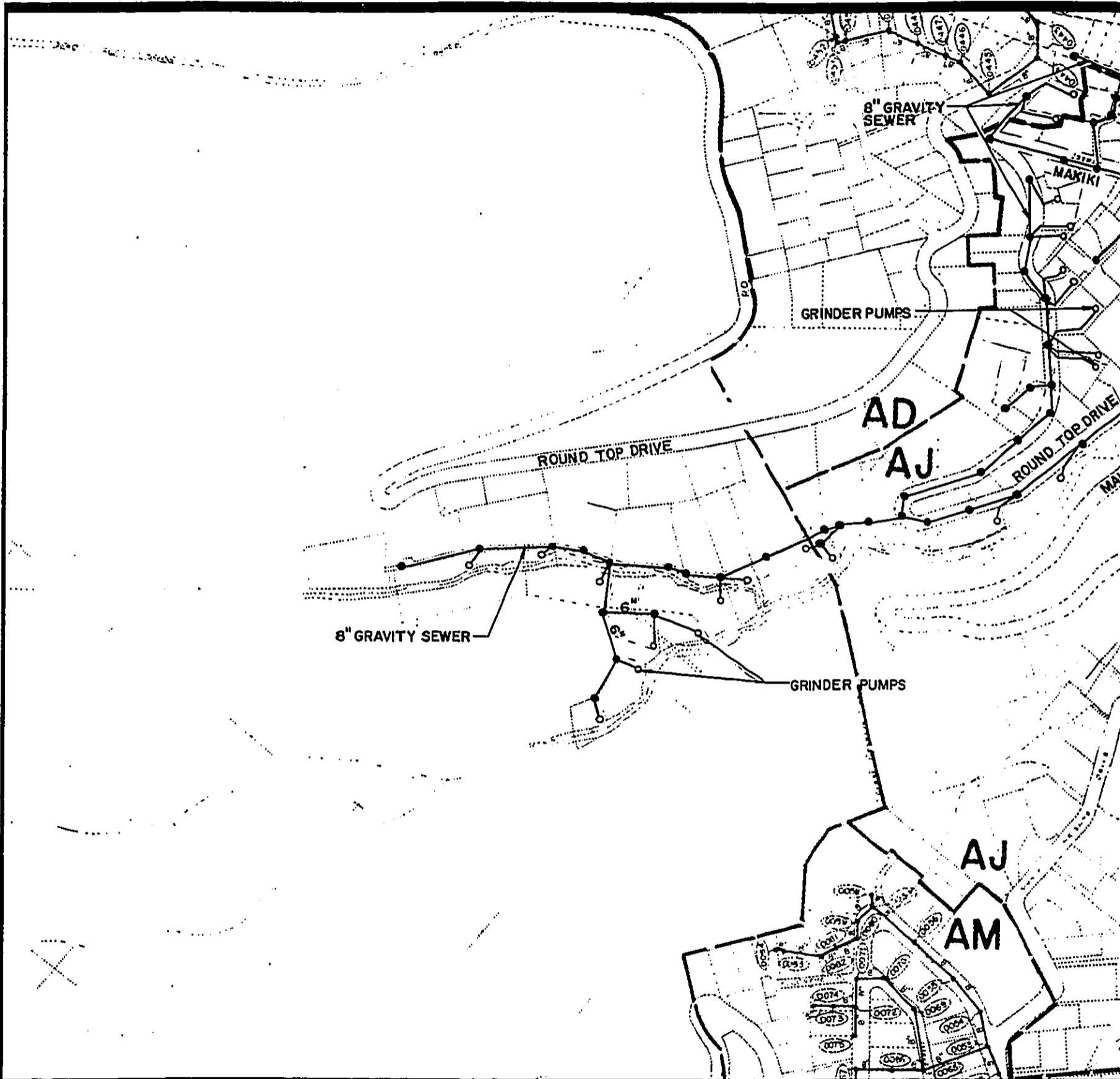
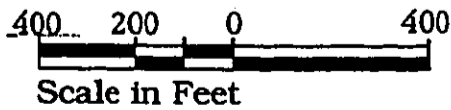


Figure A-80
 Extending the Collection System into Unsewered Areas:
 Makiki Heights-Sub-Area 3,
 Conventional Gravity Sewerage



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



North

- LEGEND:**
- MANHOLE
 - GRINDER PUMP

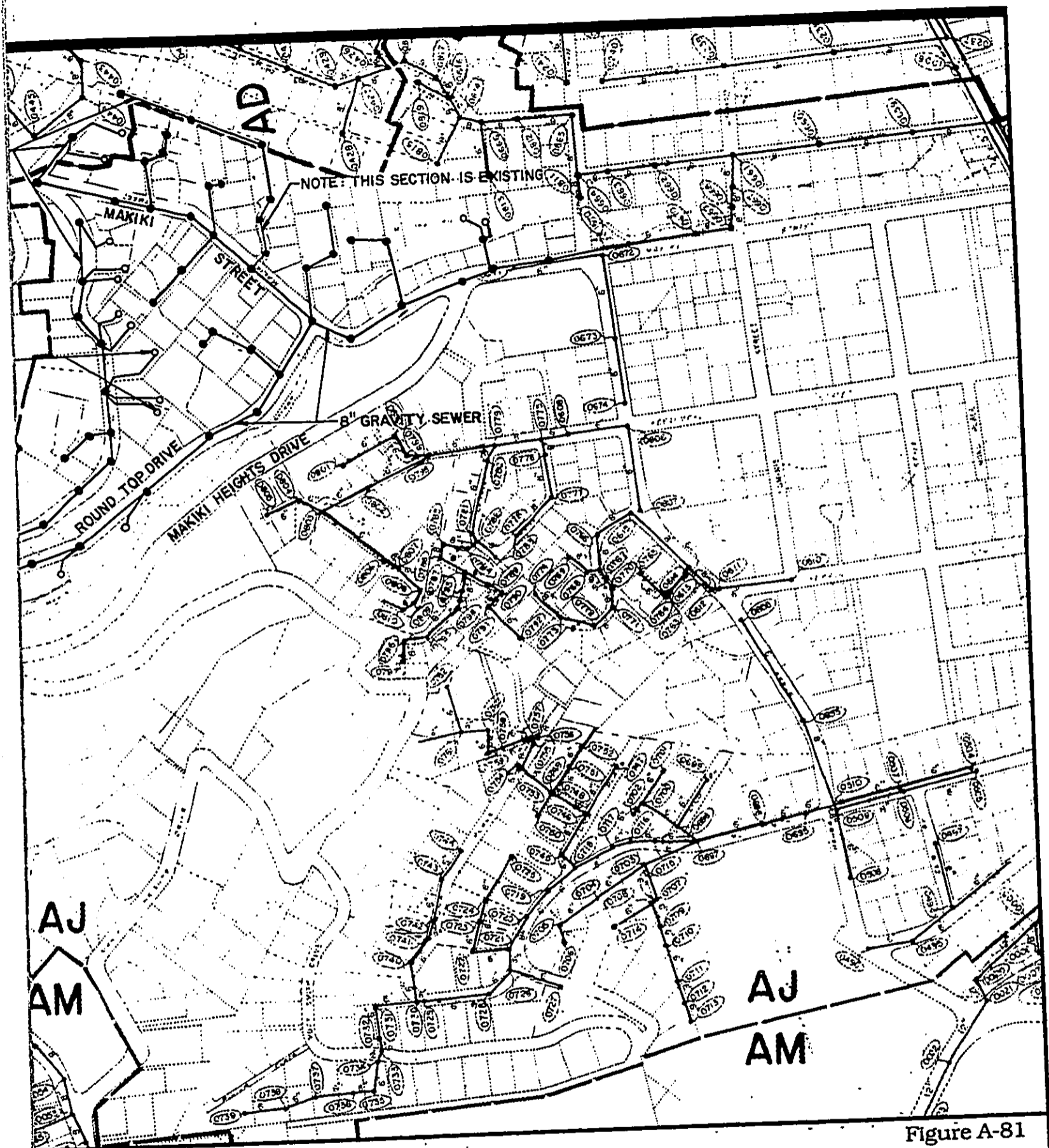
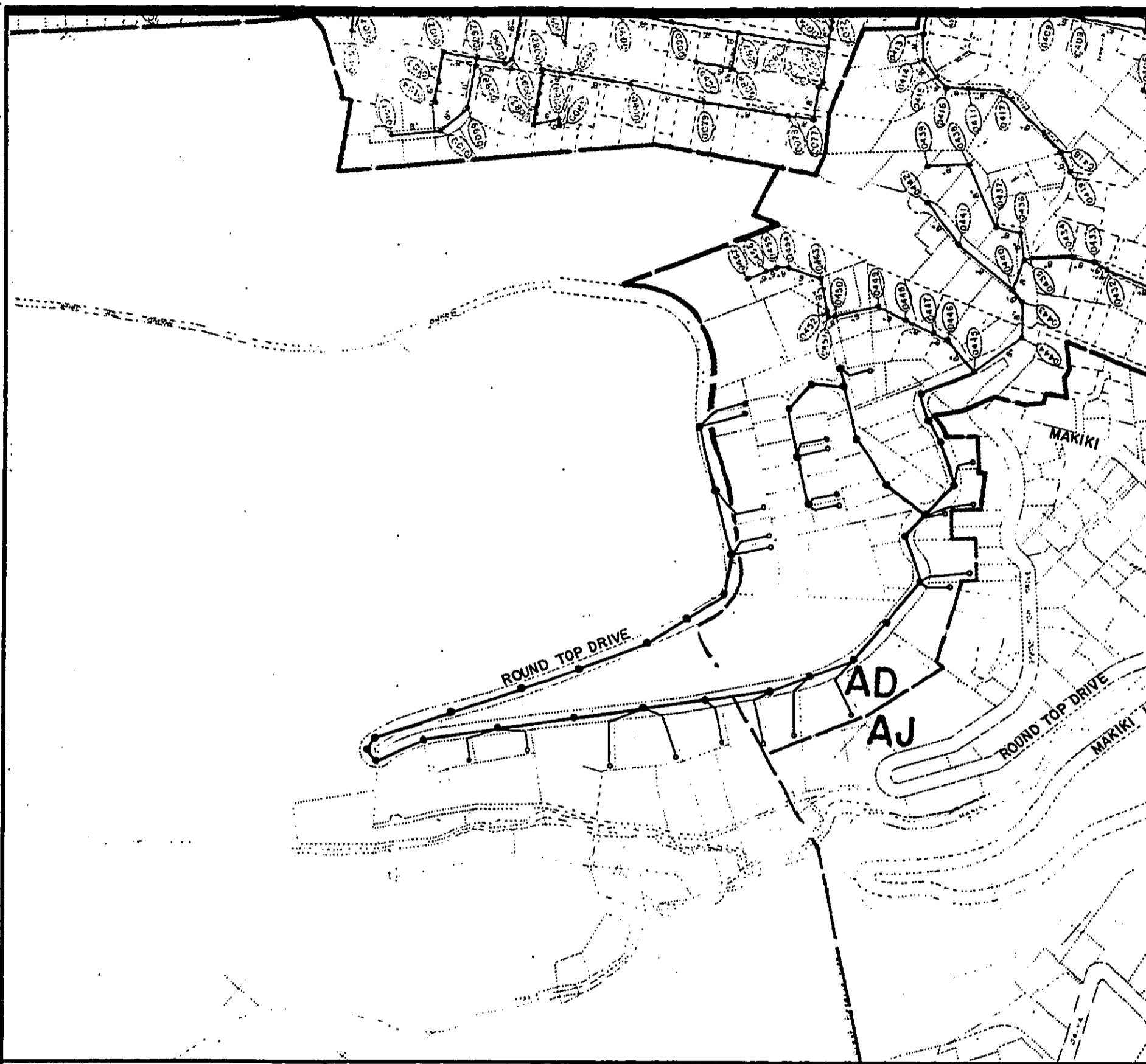


Figure A-81
 Extending the Collection System into Unsewered Areas:
 Makiki Heights-Sub-Area 4,
 Conventional Gravity Sewerage



EAST MAMALA BAY

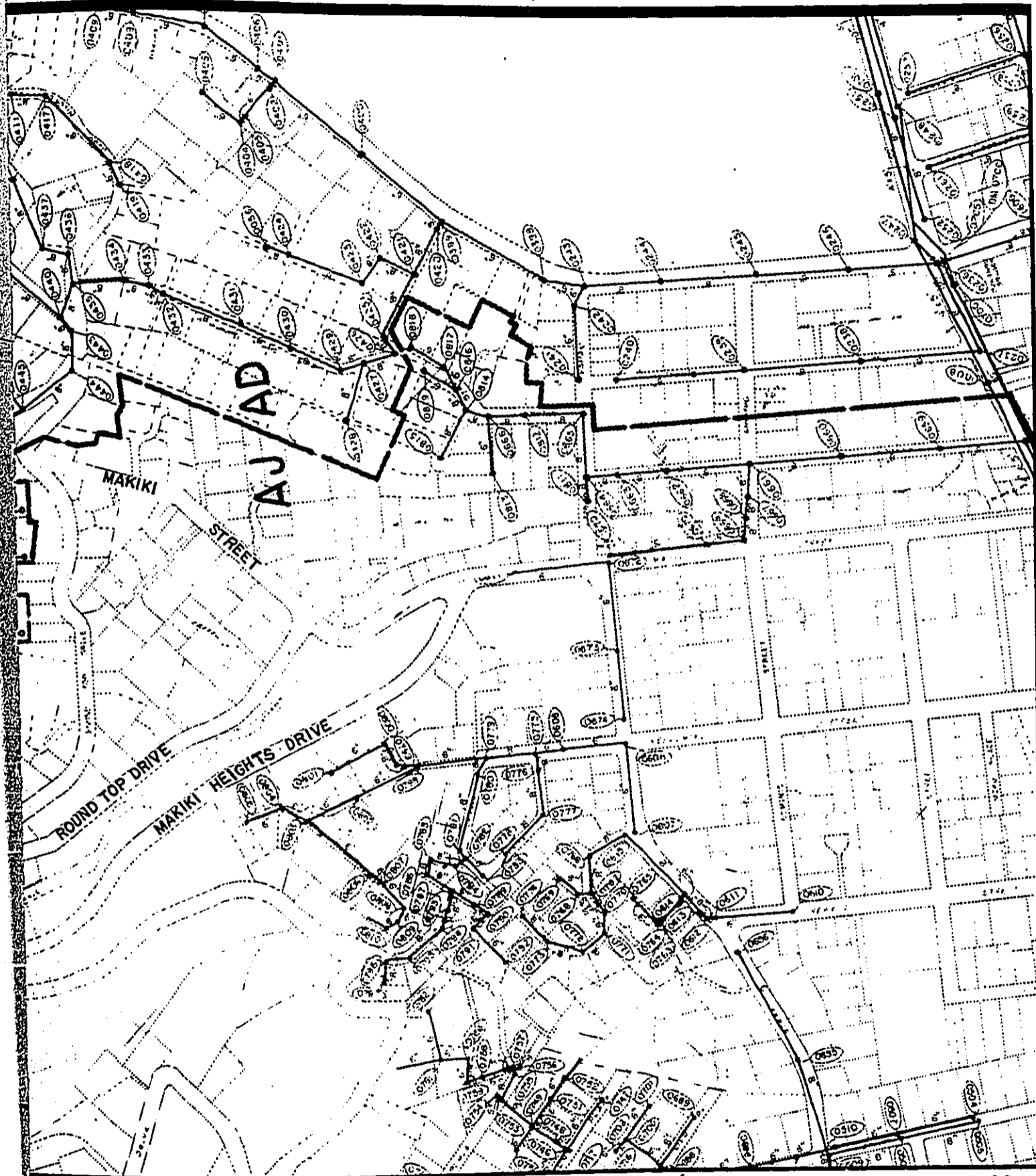
WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



North

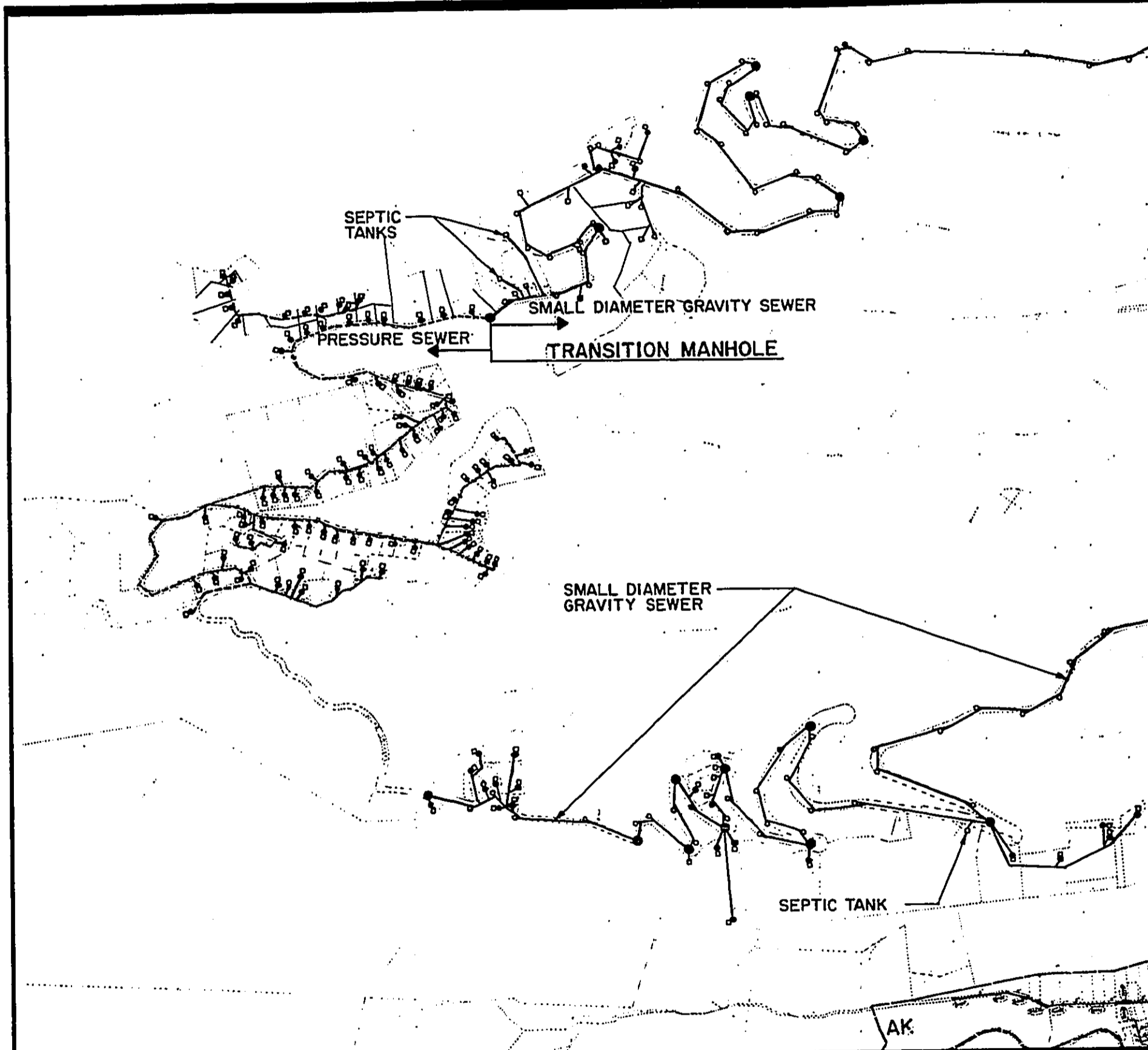
LEGEND:

- 8" Gravity Sewer w/Manhole
- Grinder Pump w/Lateral

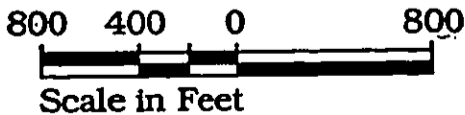


Manhole
Lateral

Figure A-82
 Extending the Collection System into Unsewered Areas:
 Makiki Heights-Sub-Area 5,
 Conventional Gravity Sewerage



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



LEGEND:

- Small Diameter Gravity Sewer Line
- Pressure Sewer Line
- Septic Tank w/Grinder Pump
- Cleanout To Grade
- Standard Sewer Manhole

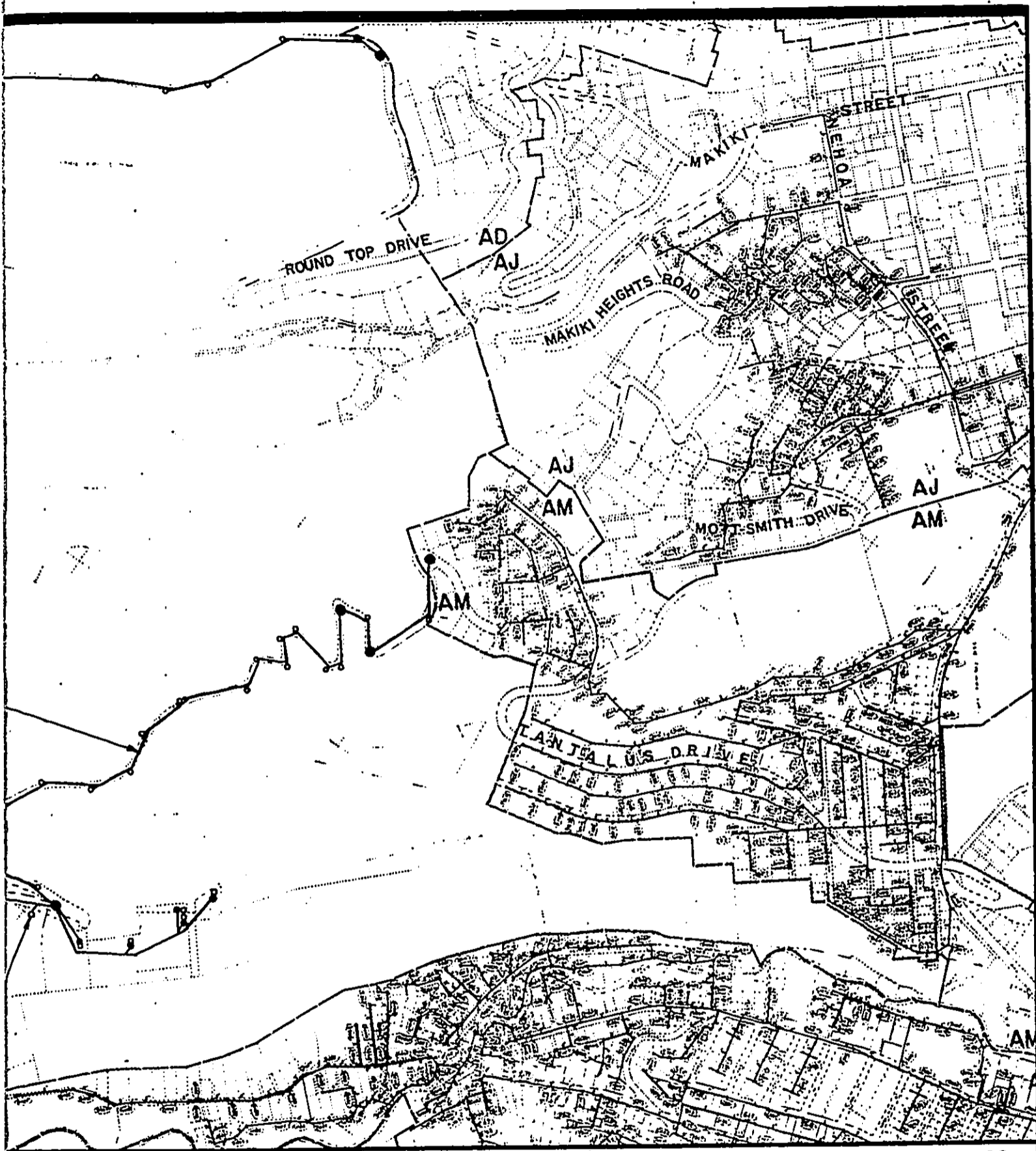
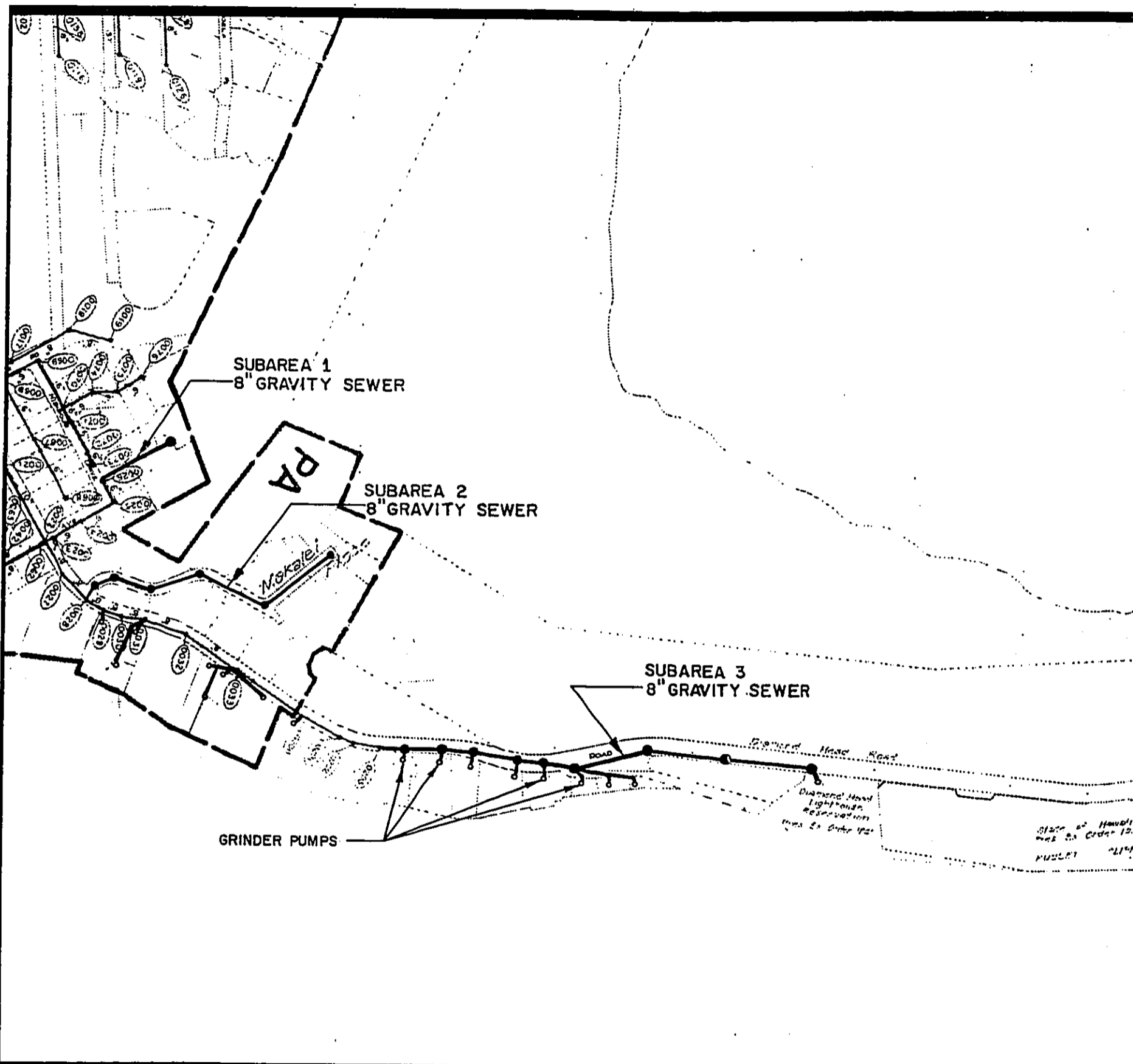


Figure A-83

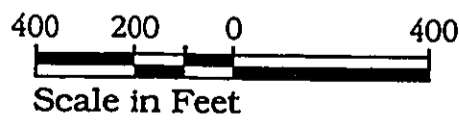
Extending the Collection System into Unsewered Areas:
Upper Tantalus, Round Top
Low Pressure/Small Diameter Gravity Sewerage

Gravity Sewer Line
Line
Under Pump
Manhole

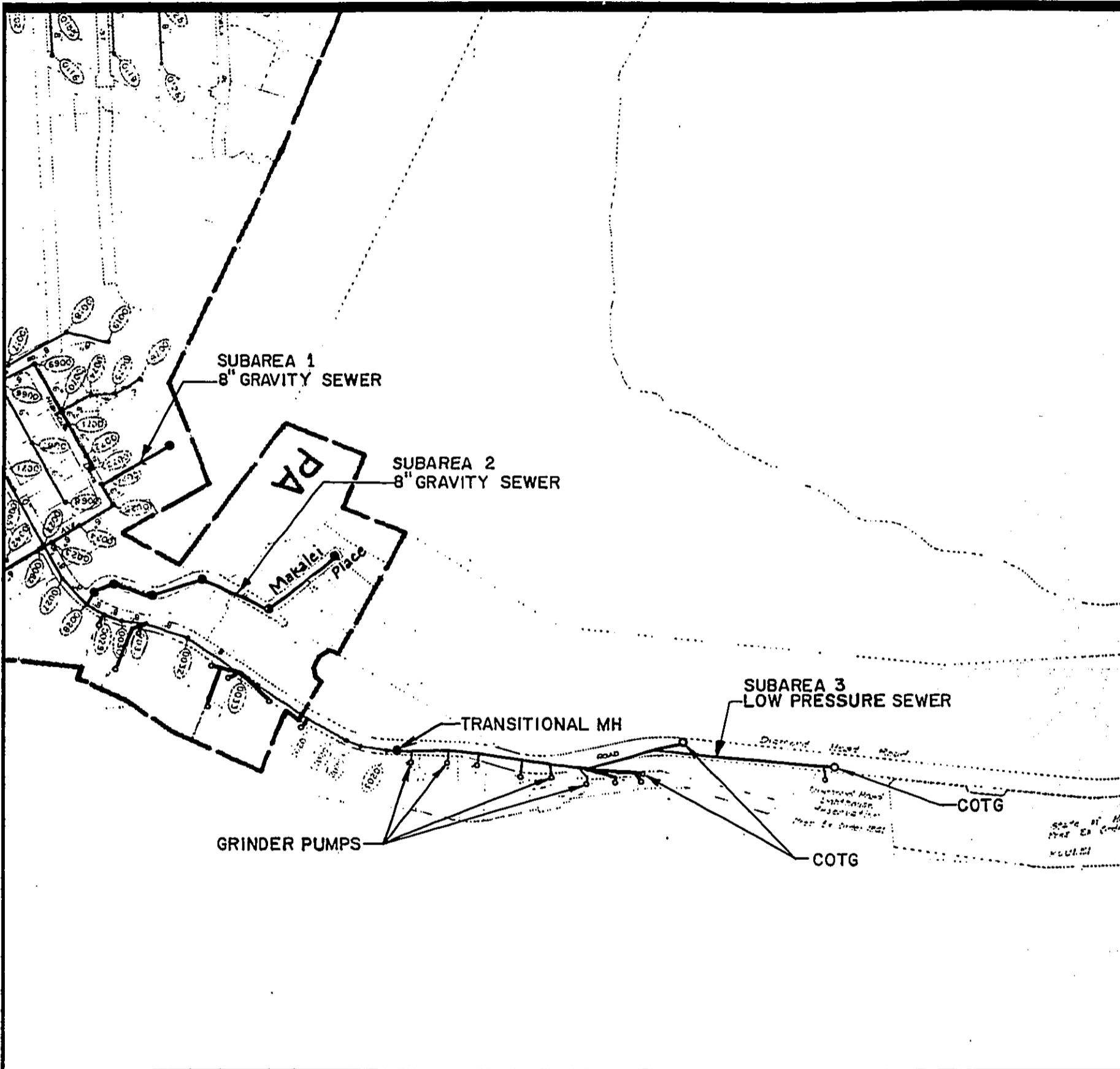


EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



LEGEND:
 ● MANHOLE
 ◻ GRINDER PUMP



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT

BELT COLLINS HAWAII • DECEMBER 1993

400 200 0 400



Scale in Feet



North

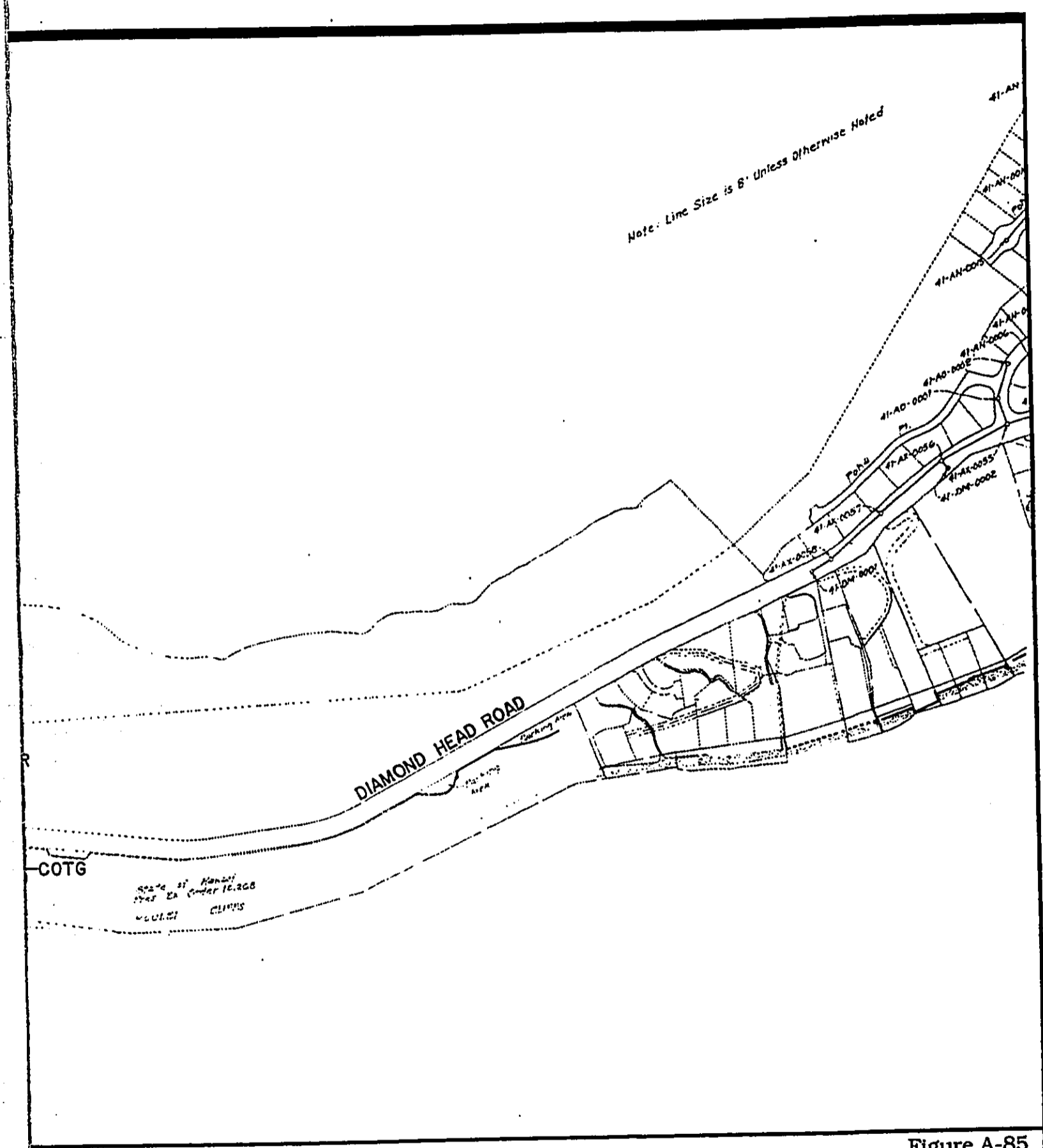
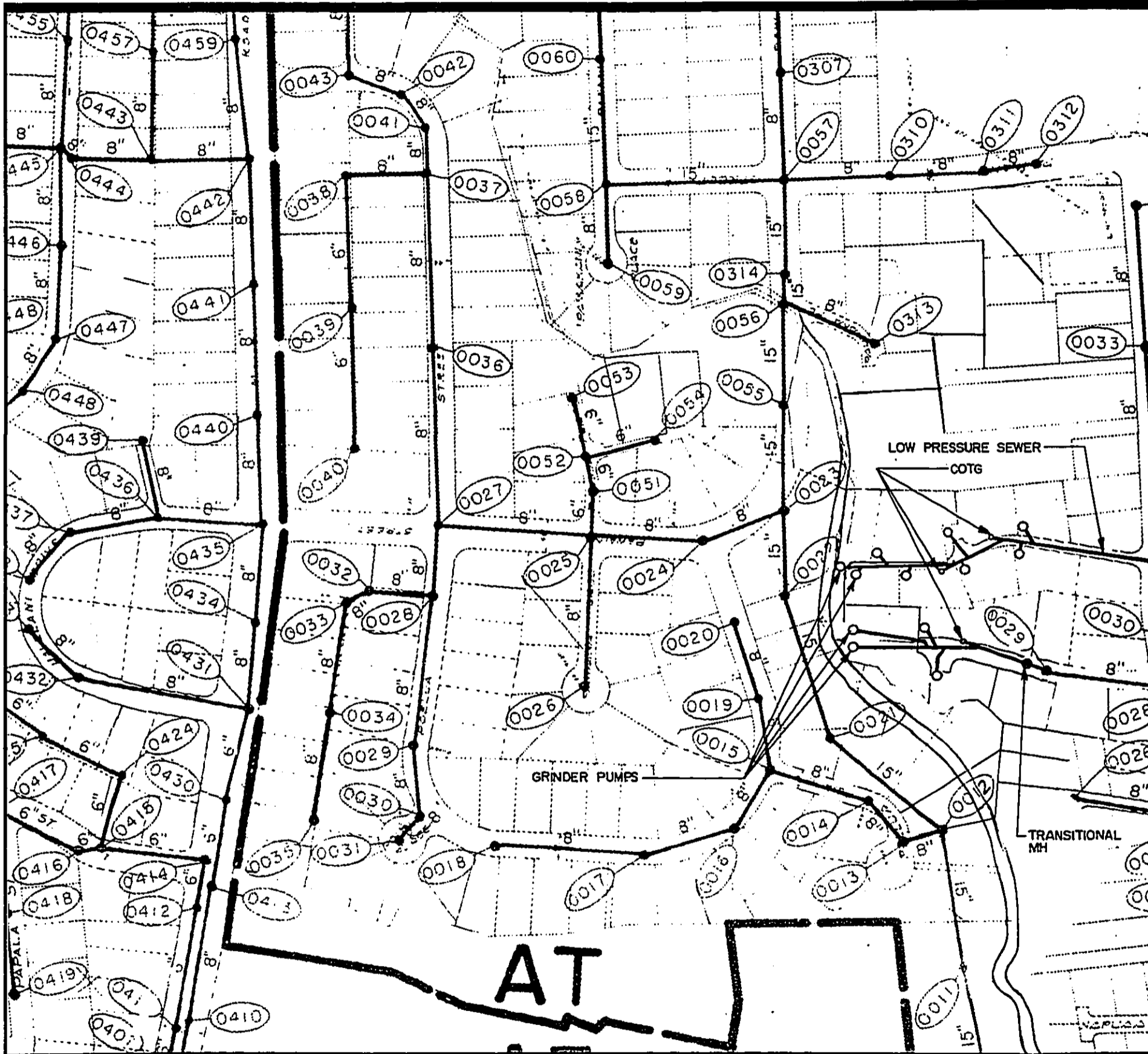


Figure A-85

**Extending the Collection System into Unsewered Areas:
Diamond Head,
Low Pressure Sewerage**



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT

BELT COLLINS HAWAII • DECEMBER 1993



Scale in Feet



North

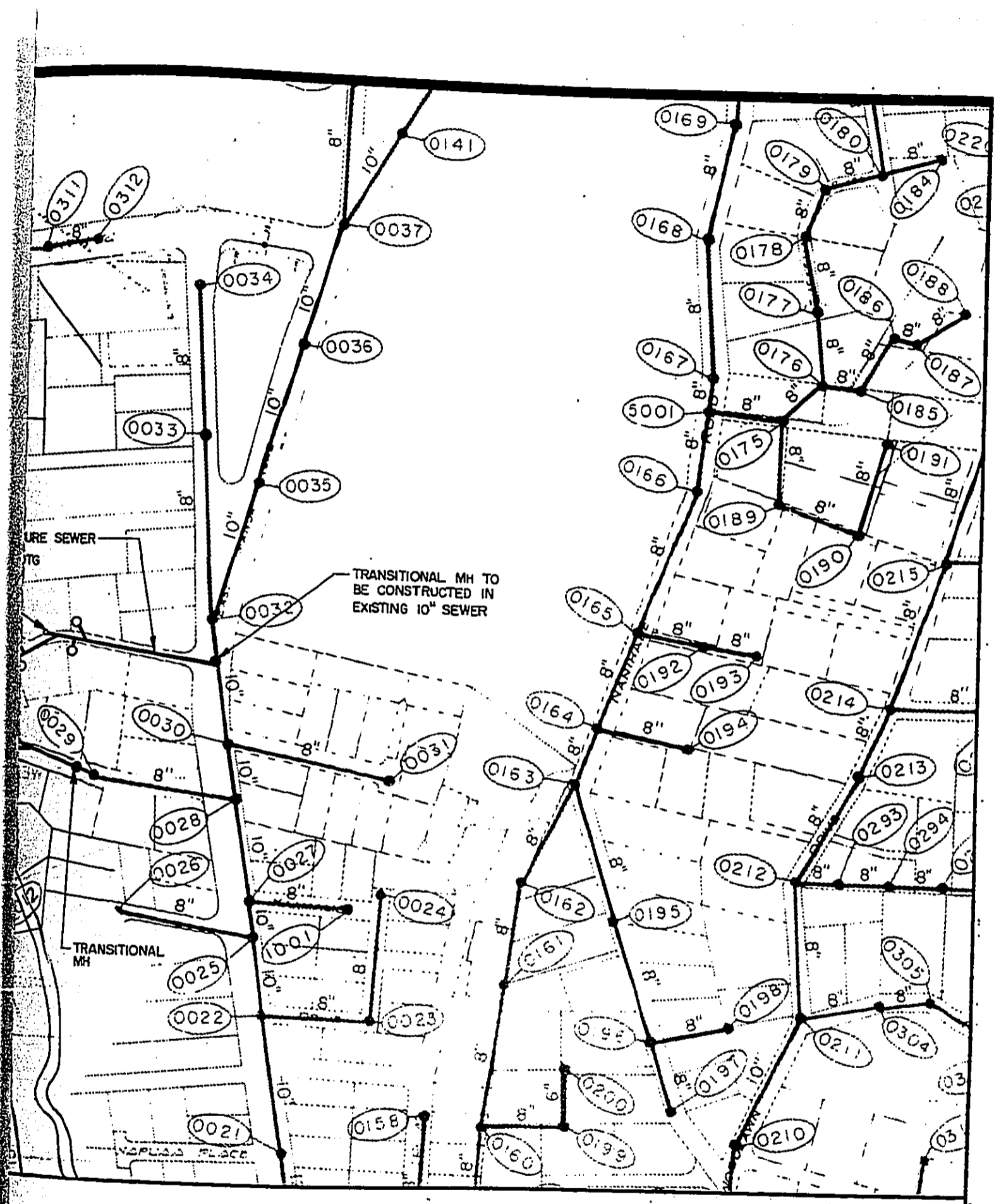
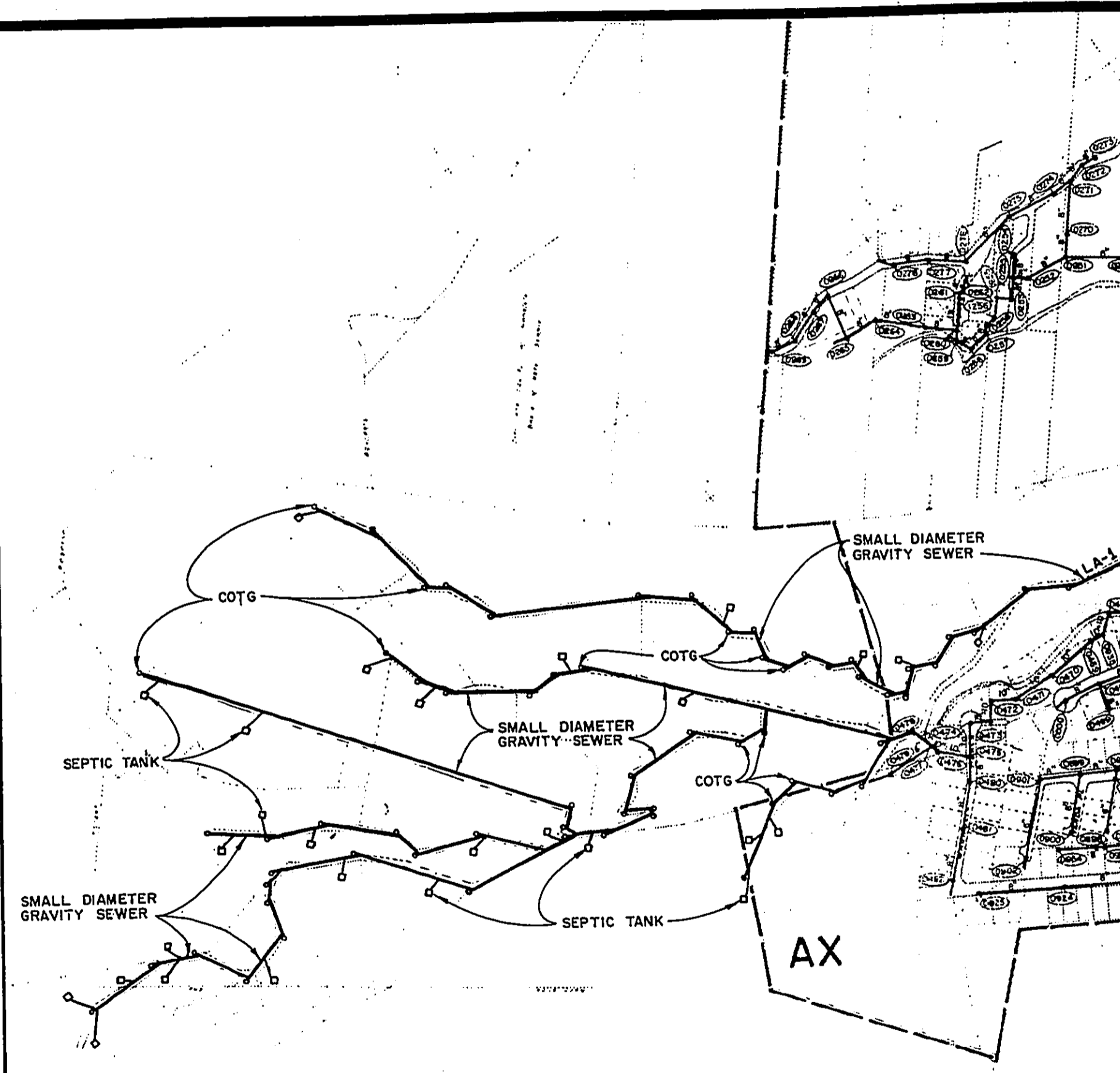
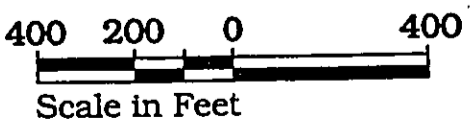


Figure A-86
 Extending the Collection System into Unsewered Areas:
 East Manoa Road, Kinohou Place,
 Low Pressure Sewerage



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993





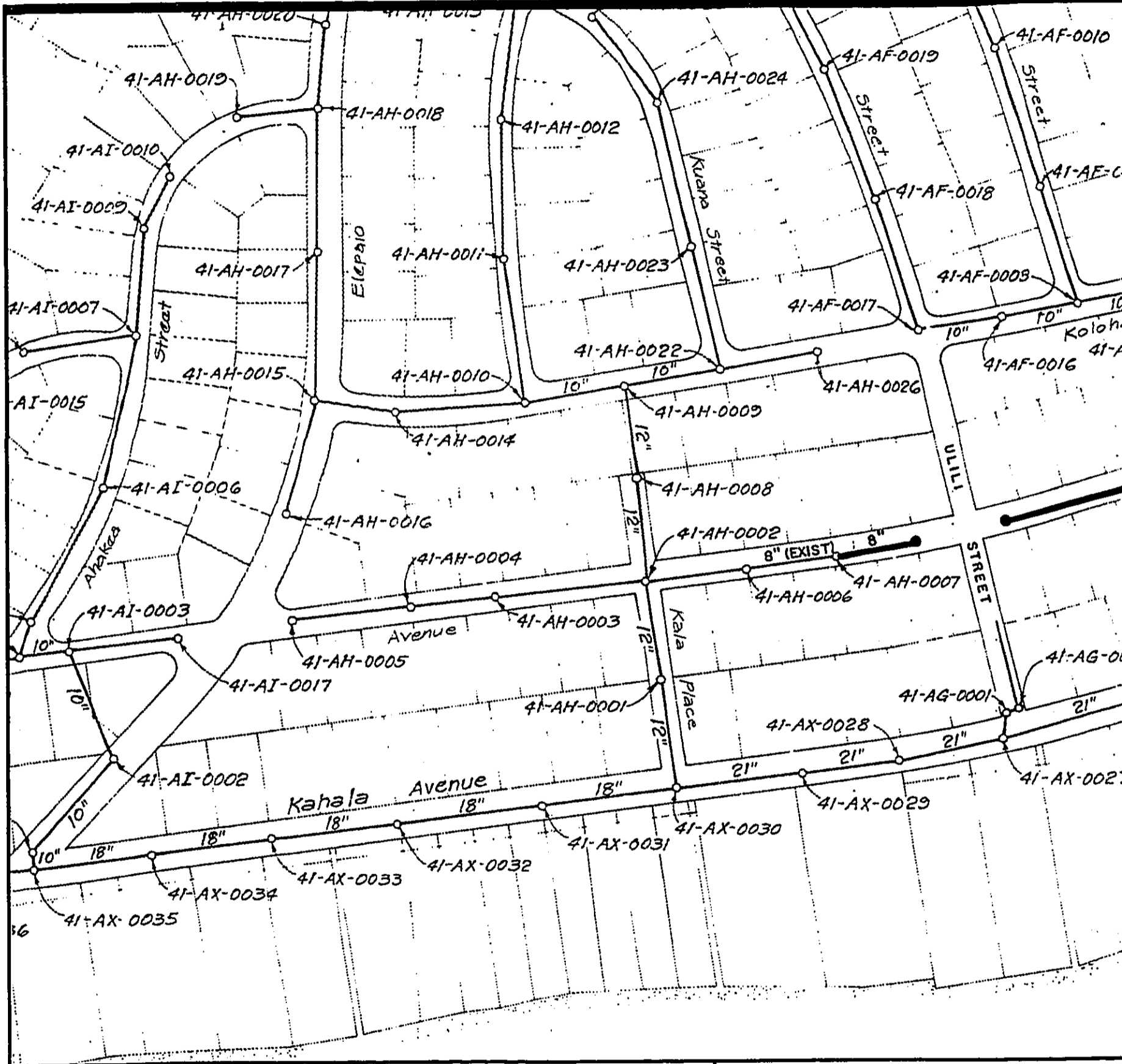
- LEGEND:**
-  Septic Tank
 -  Small Diameter Gravity Sewer w/
Cleanout To Grade (COTG)



Figure A-87

Extending the Collection System into Unsewered Areas:
 Upper Palolo Valley,
 Small Diameter Gravity Sewerage

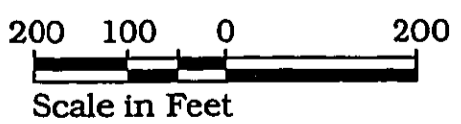
or Gravity Sewer w/
 grade (COTG)



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT

BELT COLLINS HAWAII • DECEMBER 1993



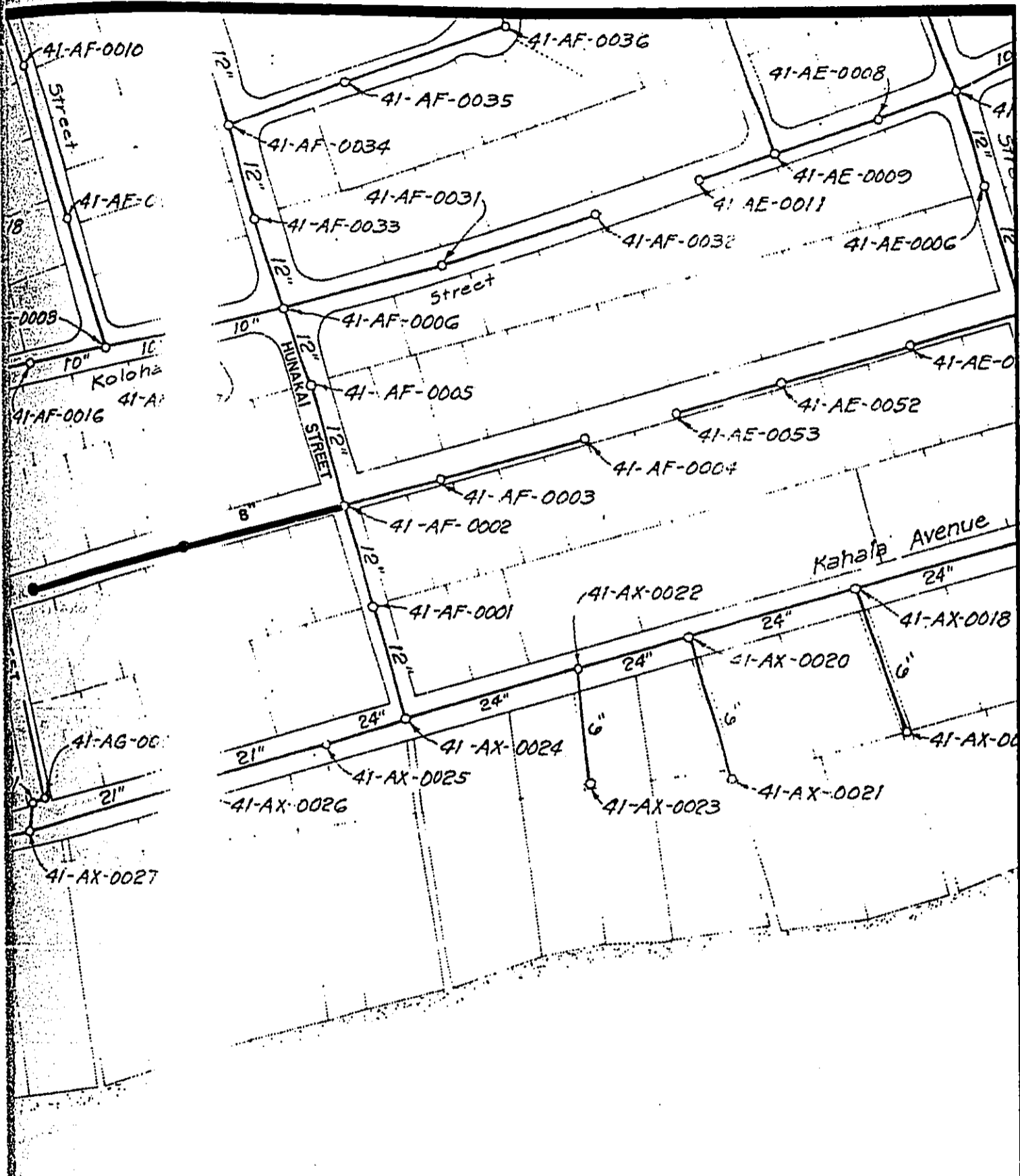
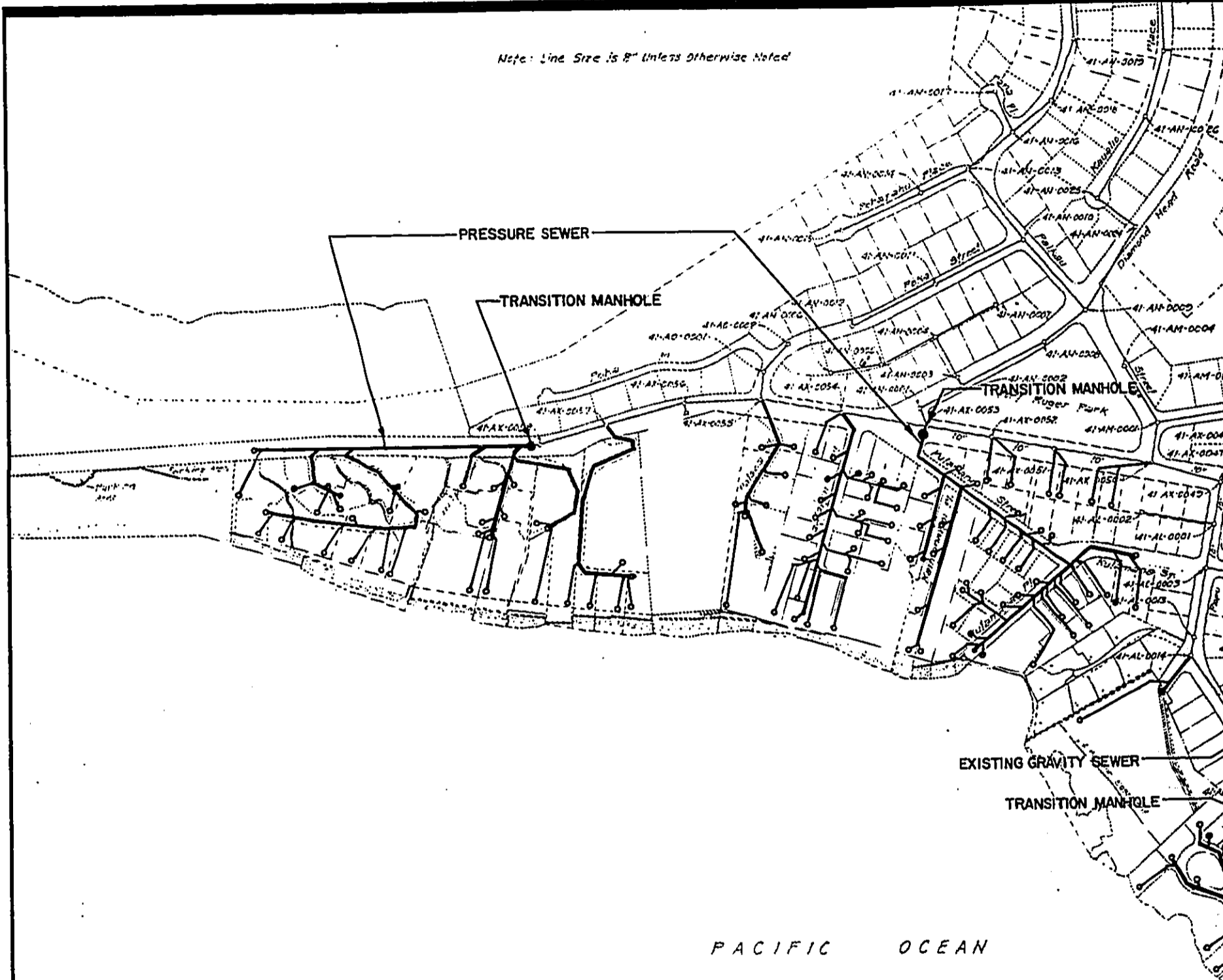
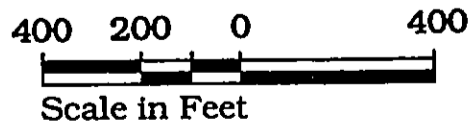


Figure A-88
 Extending the Collection System into Unsewered Areas:
 Aukai Avenue,
 Conventional Gravity Sewerage

Note: Line Size is 8" Unless Otherwise Noted



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
BELT COLLINS HAWAII • DECEMBER 1993



North

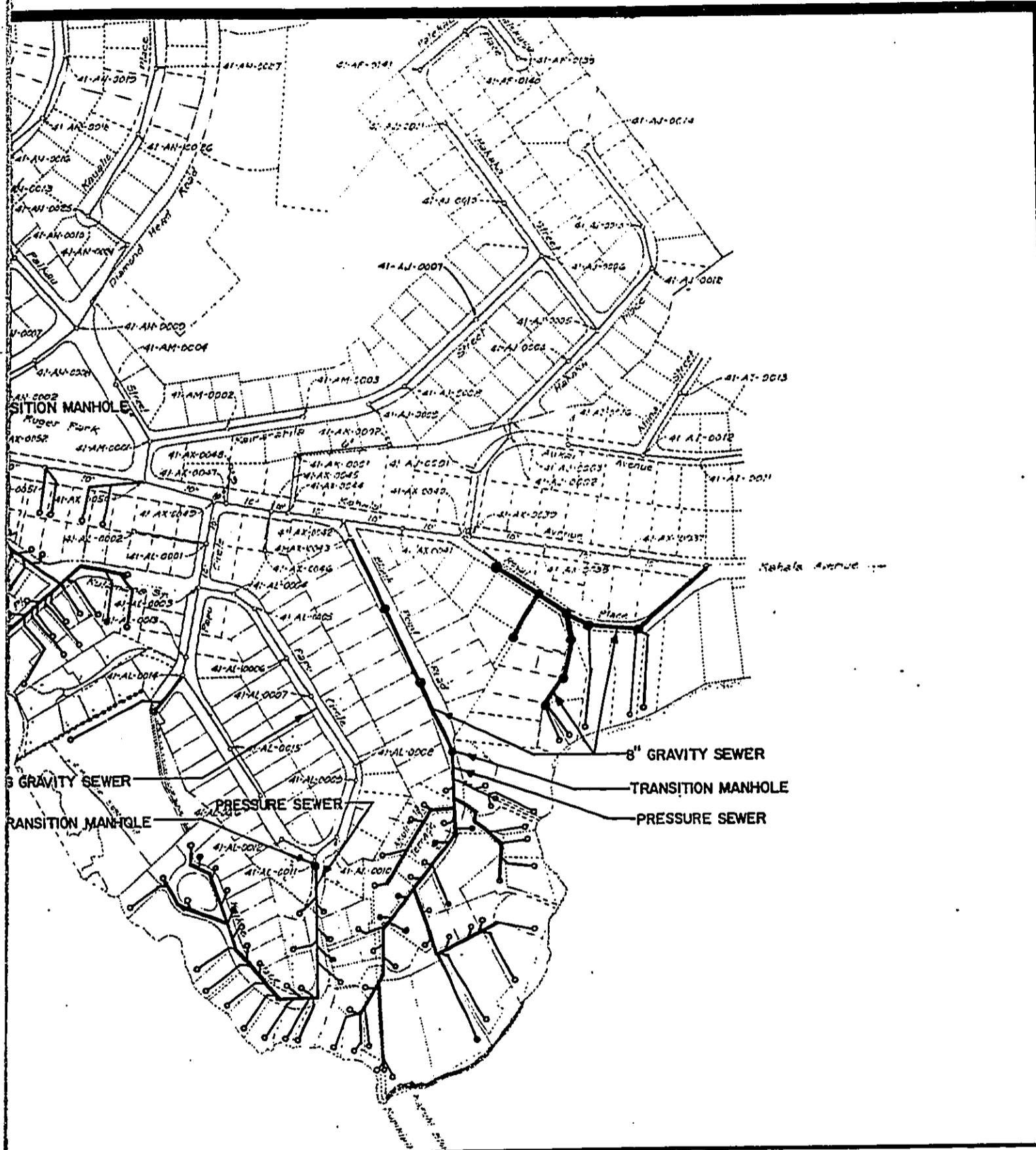
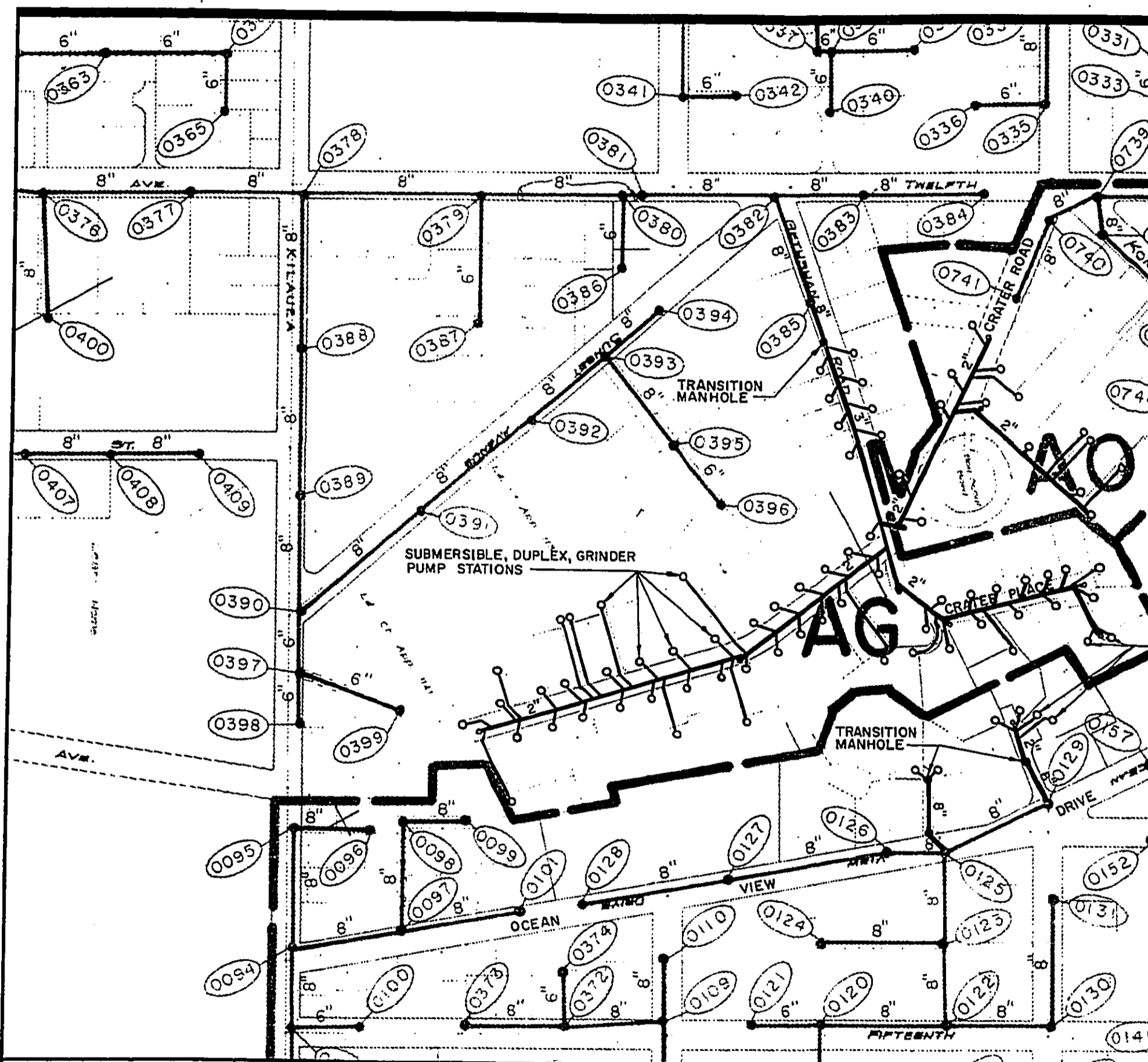
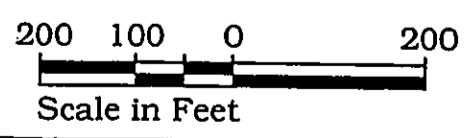


Figure A-89
 Extending the Collection System into Unsewered Areas:
 Black Point,
 Low Pressure Sewerage



EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



LEGEND:

	Small Diameter Gravity Sewer Line
	Submersible, Duplex, Grinder Pump Station
	Cleanout To Grade

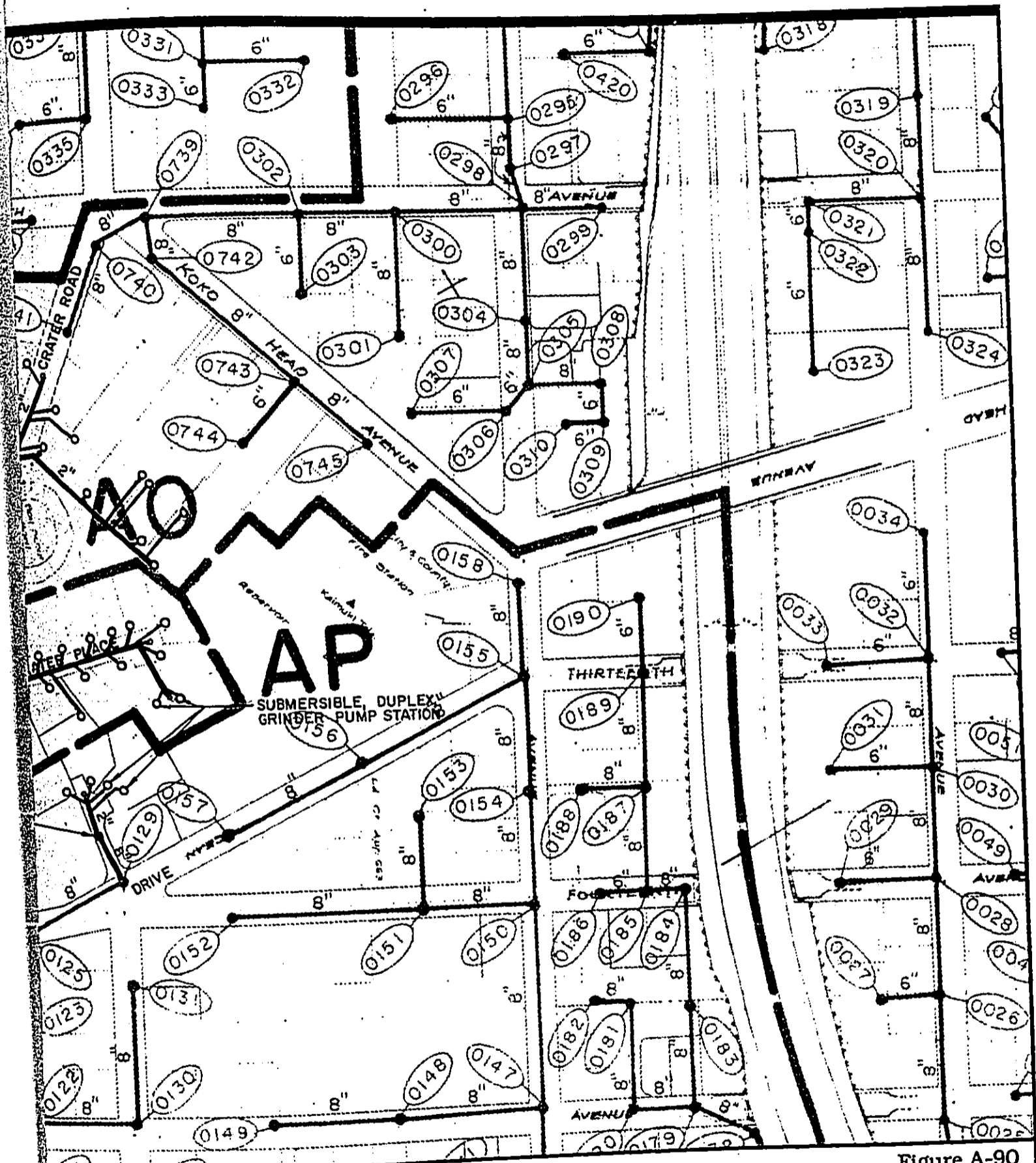
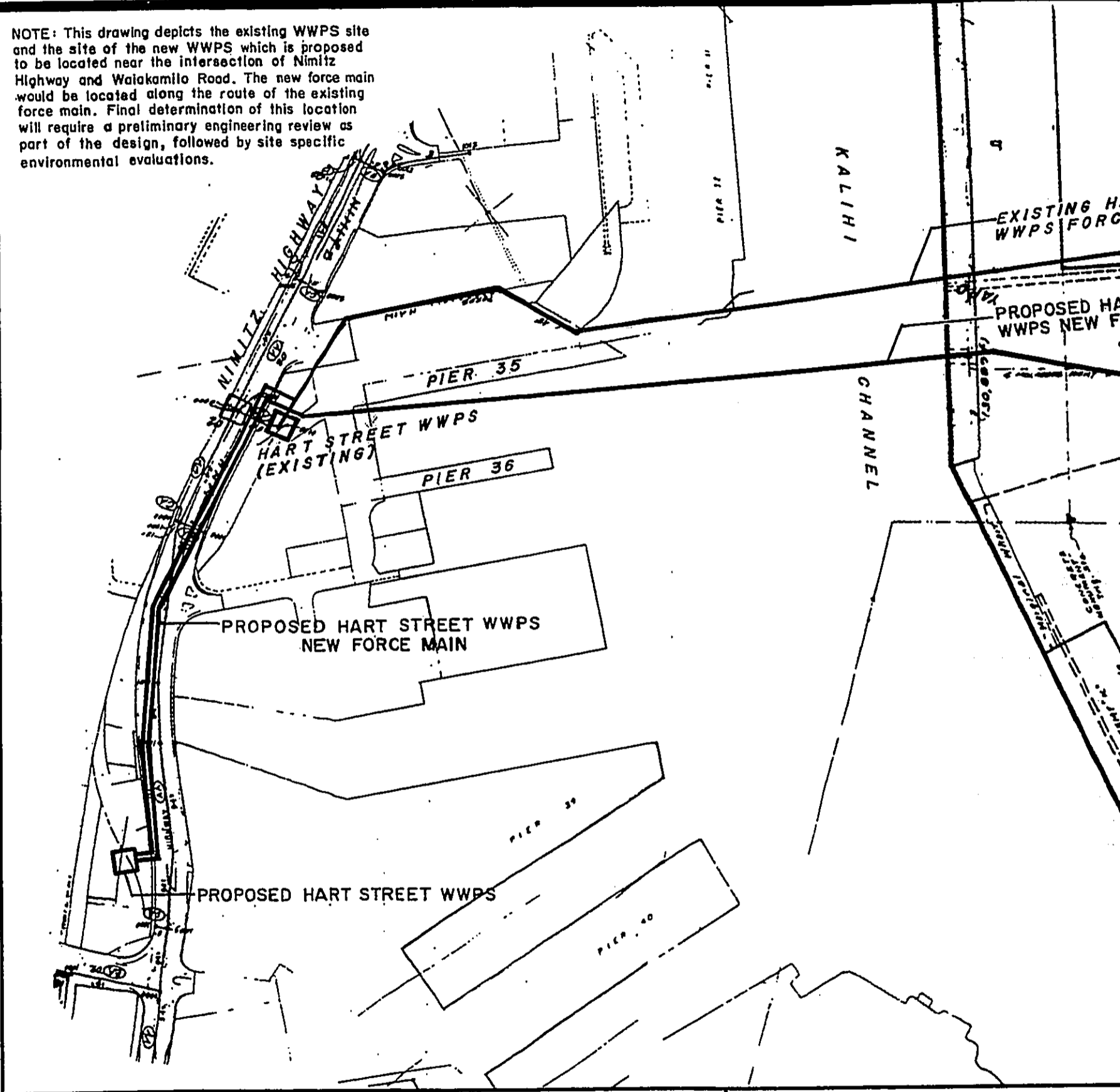


Figure A-90

Extending the Collection System into Unsewered Areas:
 Crater Road Area,
 Low Pressure Sewerage

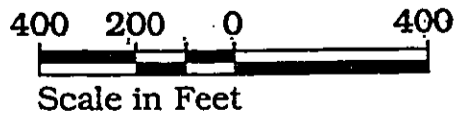
wer Line
 der Pump Station

NOTE: This drawing depicts the existing WWPS site and the site of the new WWPS which is proposed to be located near the intersection of Nimitz Highway and Waiakamilo Road. The new force main would be located along the route of the existing force main. Final determination of this location will require a preliminary engineering review as part of the design, followed by site specific environmental evaluations.



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



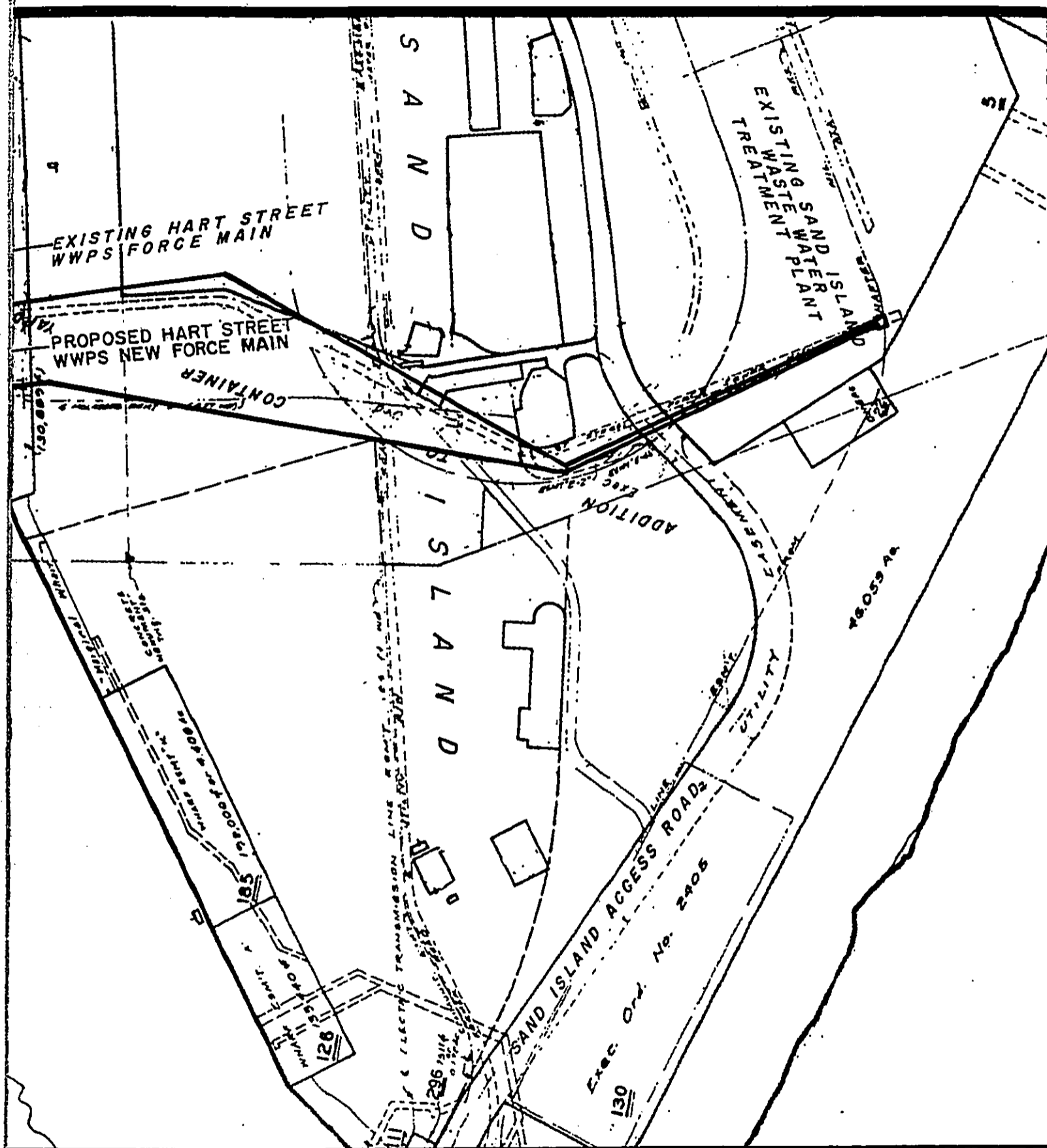
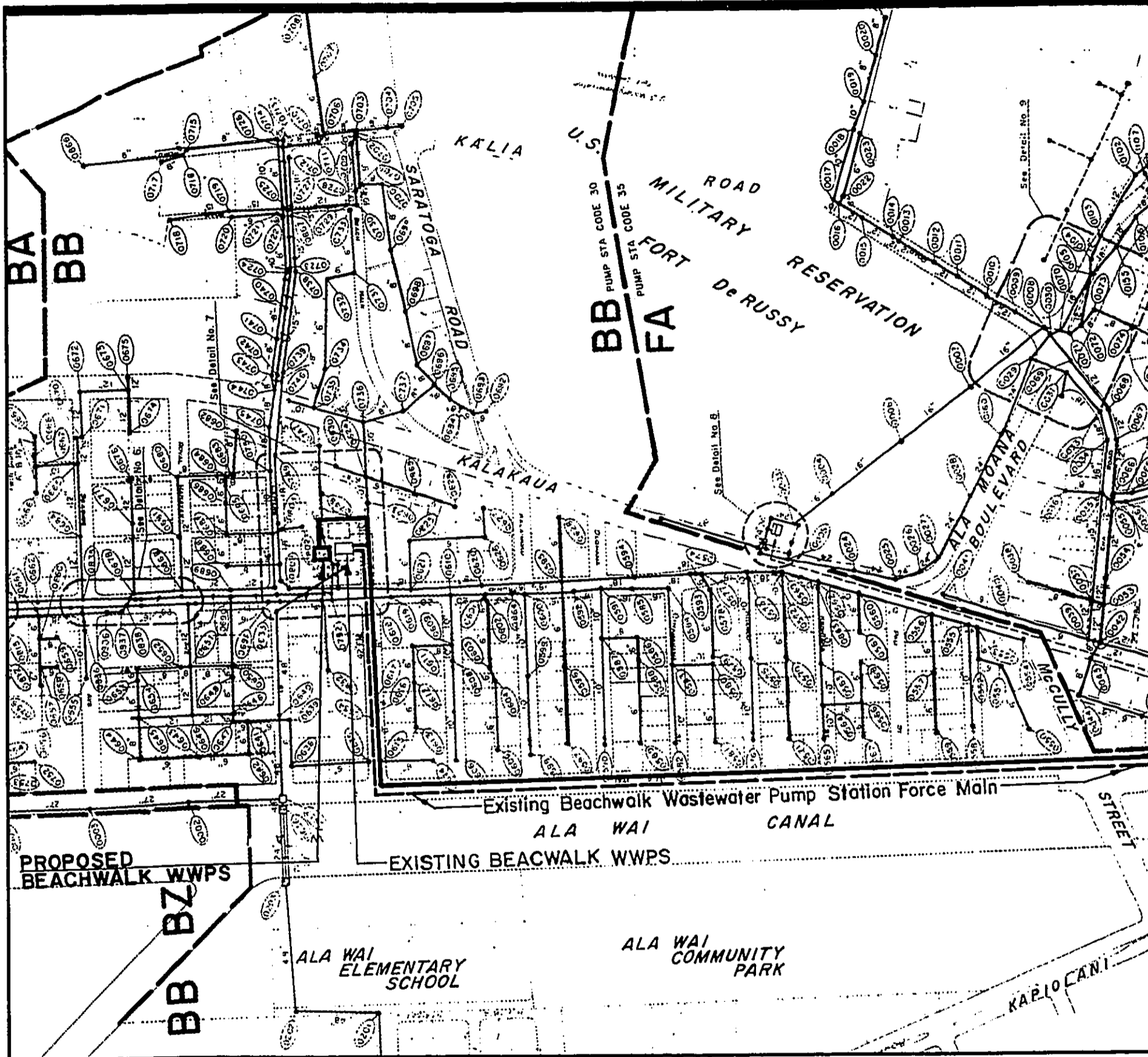
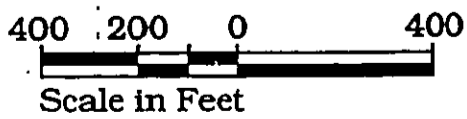


Figure A-91
Proposed Hart Street WWPS and New Force Main

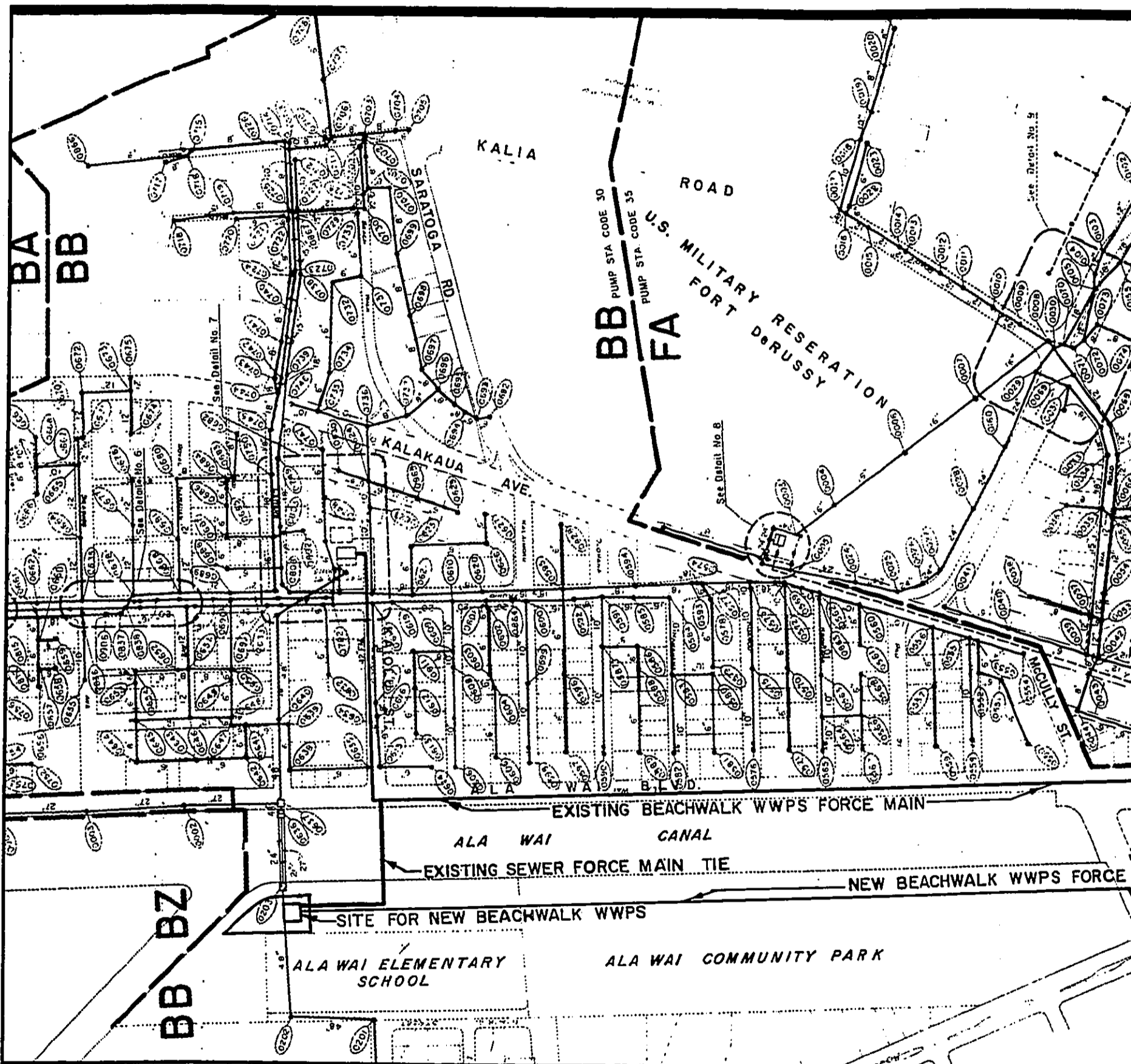


EAST MAMALA BAY
WASTEWATER FACILITIES PLAN
ENVIRONMENTAL IMPACT STATEMENT

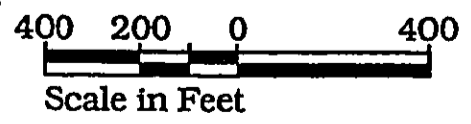
BELT COLLINS HAWAII • DECEMBER 1993



Pro



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



Beach

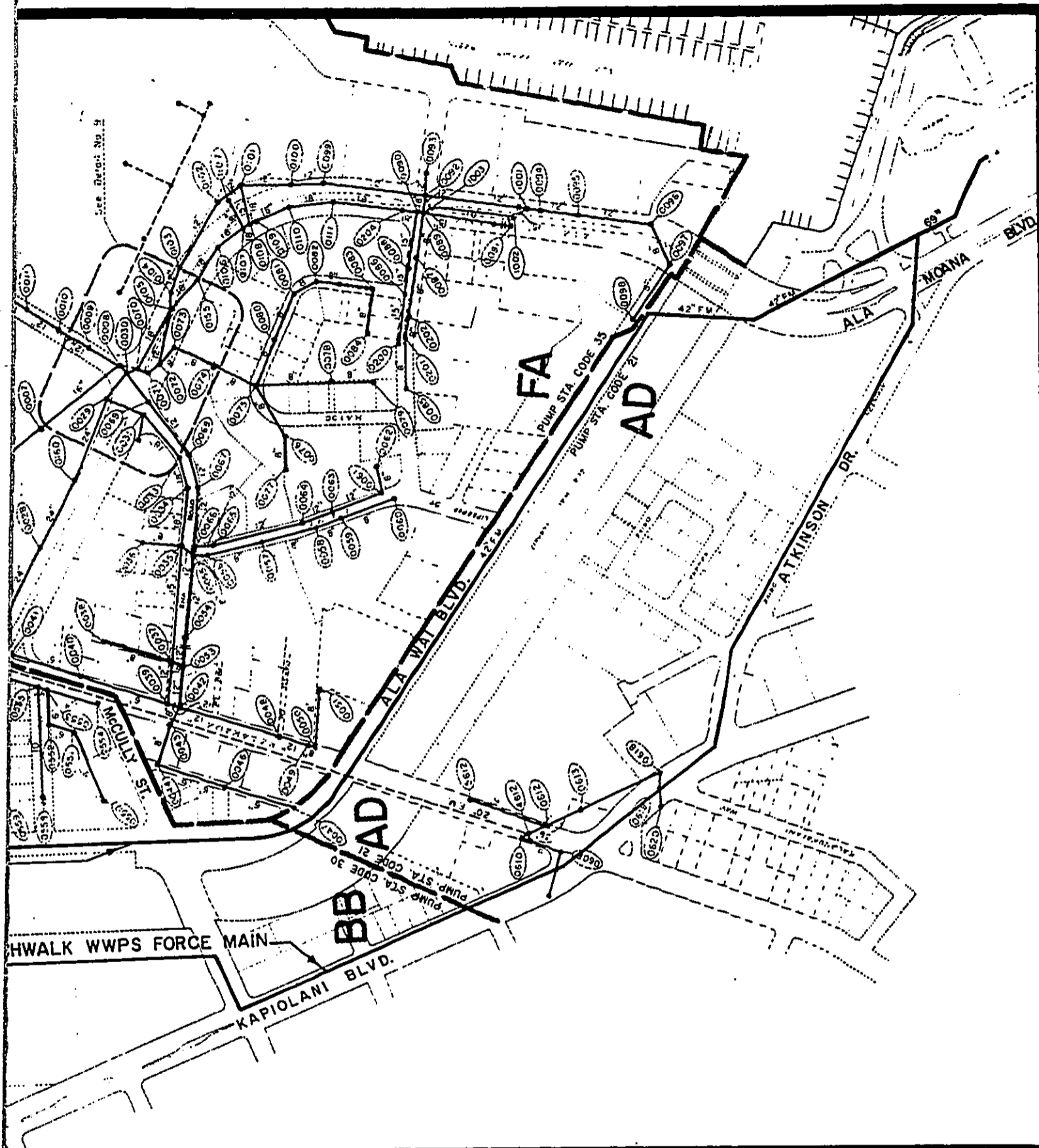
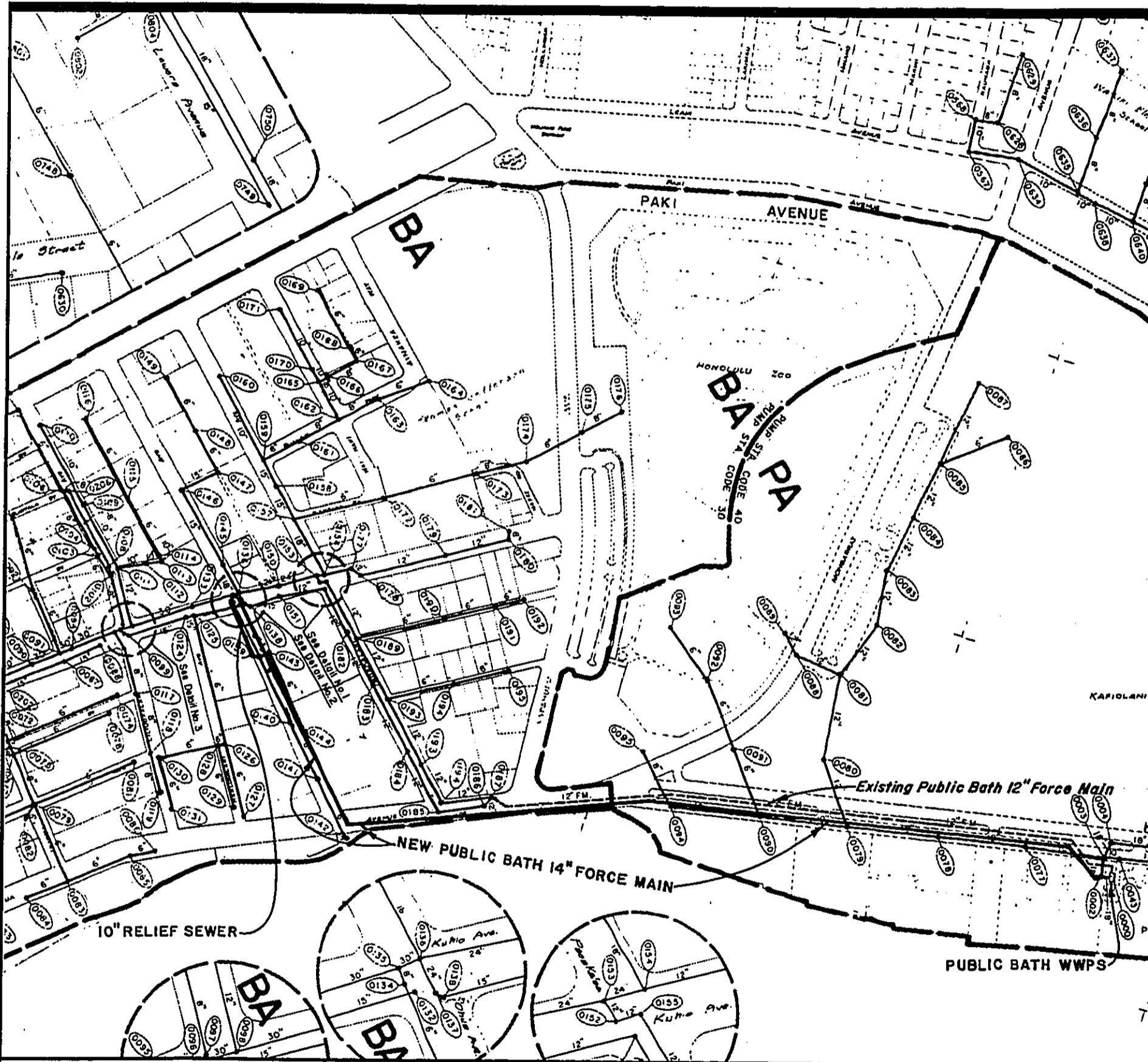


Figure A-93

Beachwalk WWPS and New Force Main (Alternate WWPS Site)



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



Pu

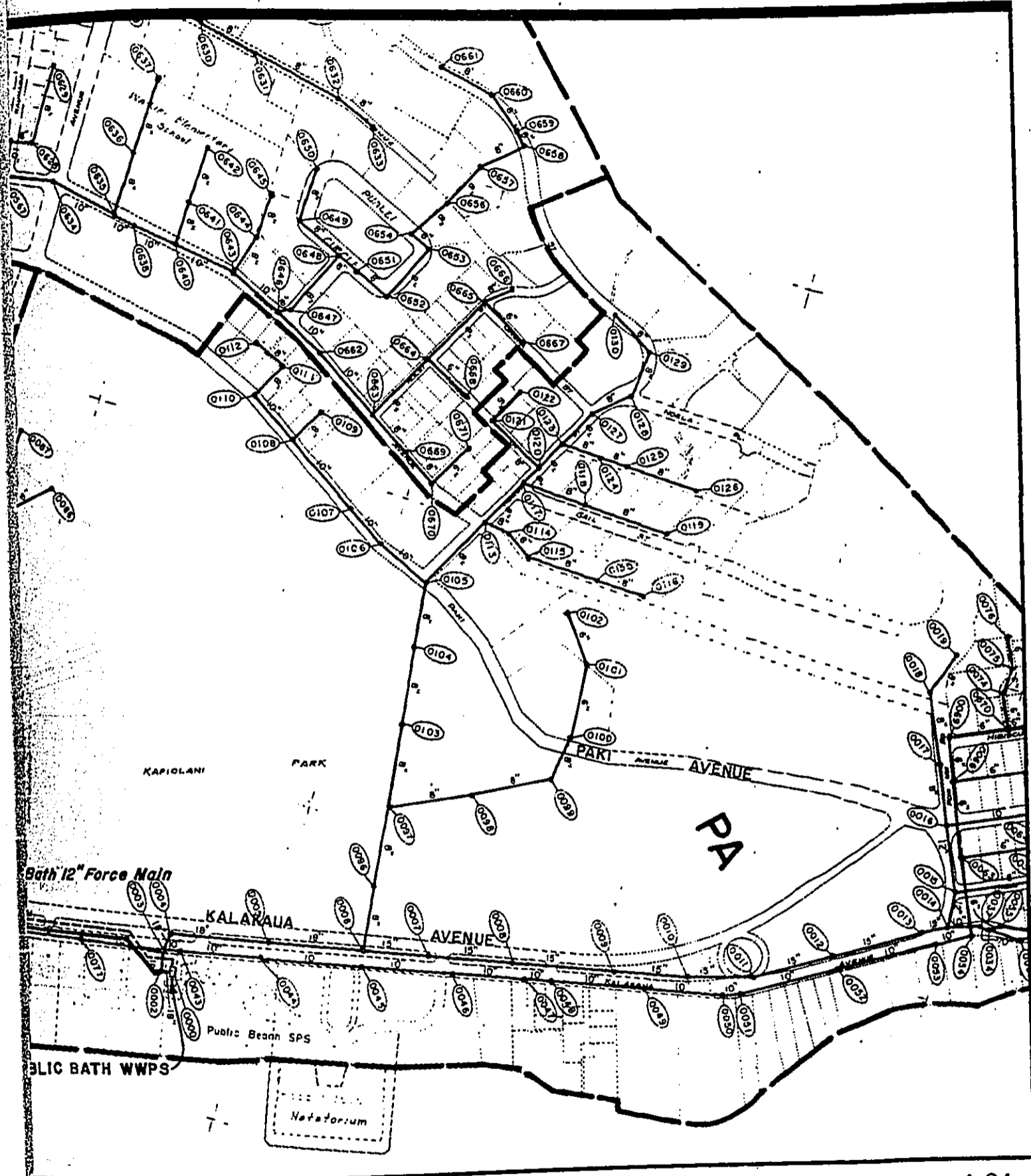
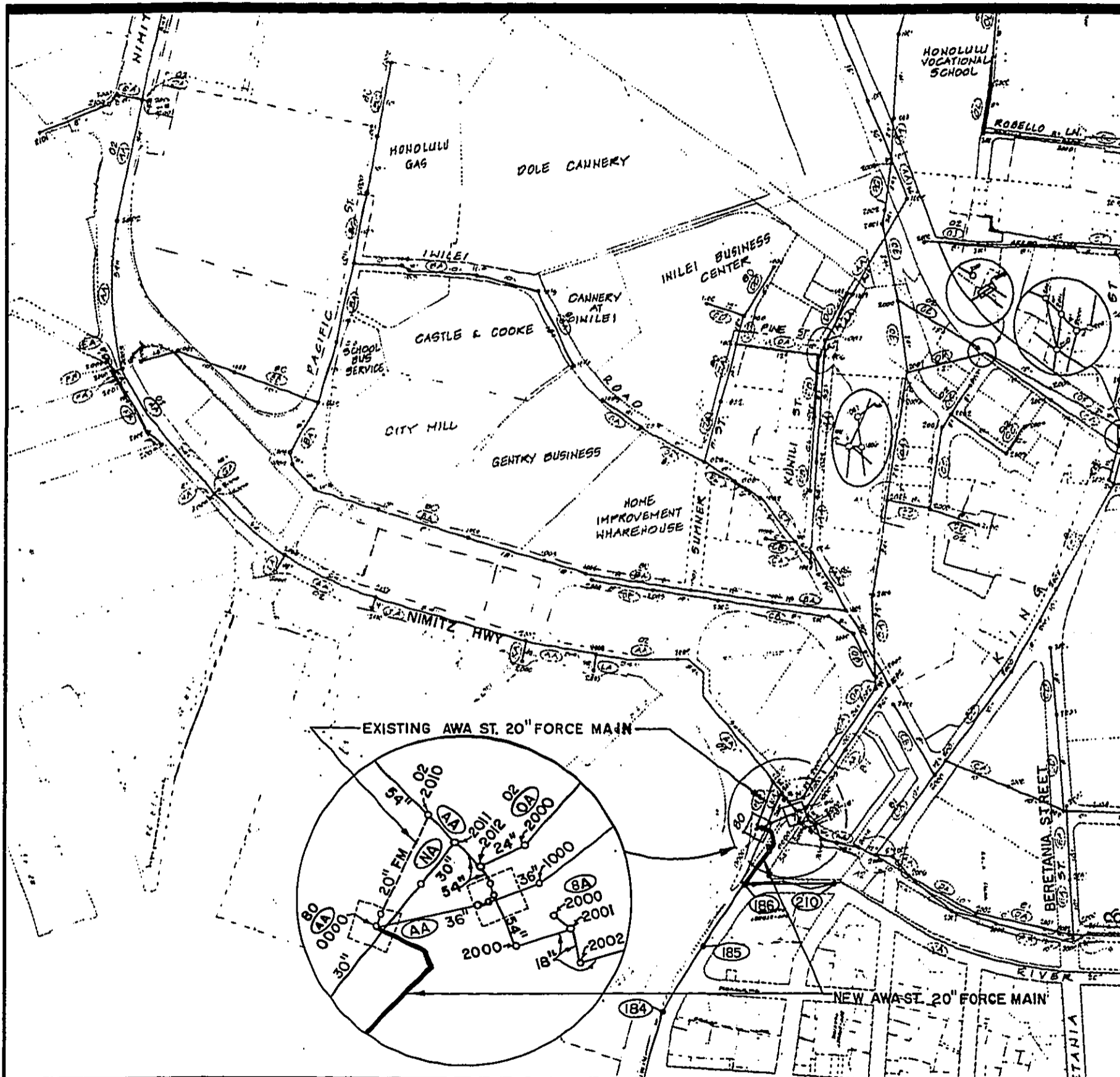
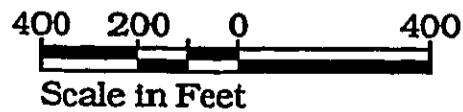


Figure A-94
 Public Baths WWPS Extended Force Main and Relief Sewer



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER, 1993



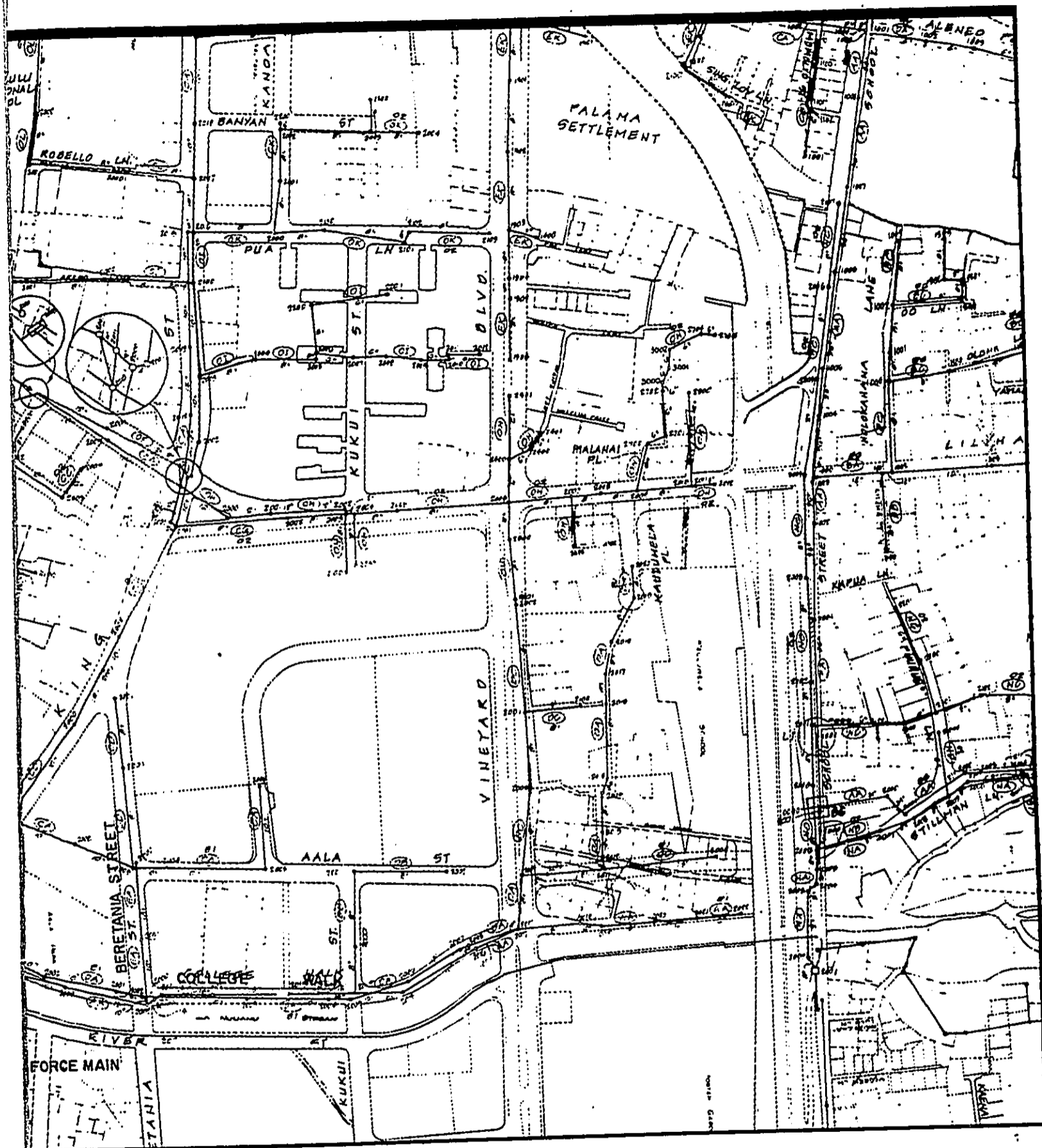


Figure A-95
 Awa St. WWPS New Force Main.

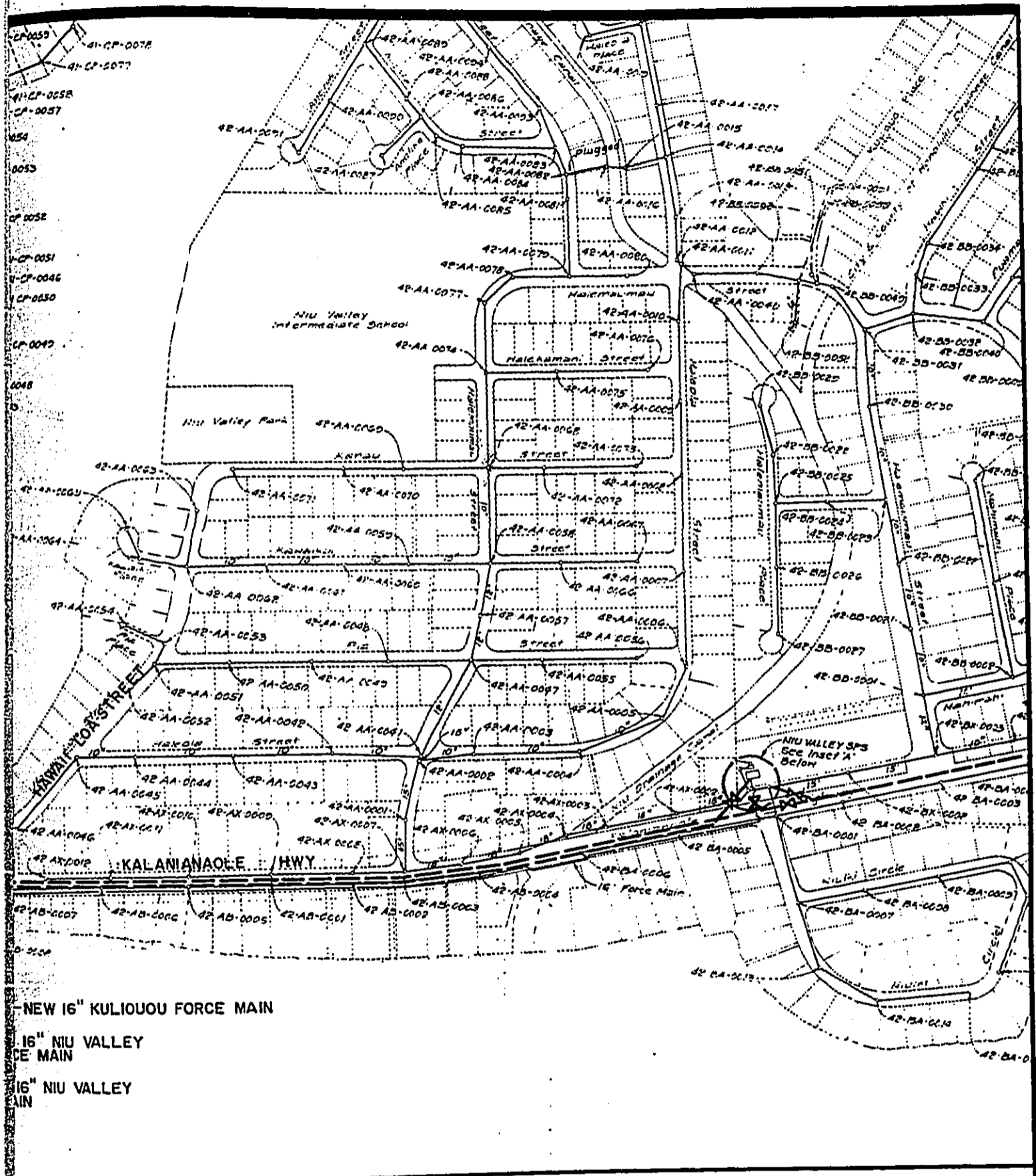
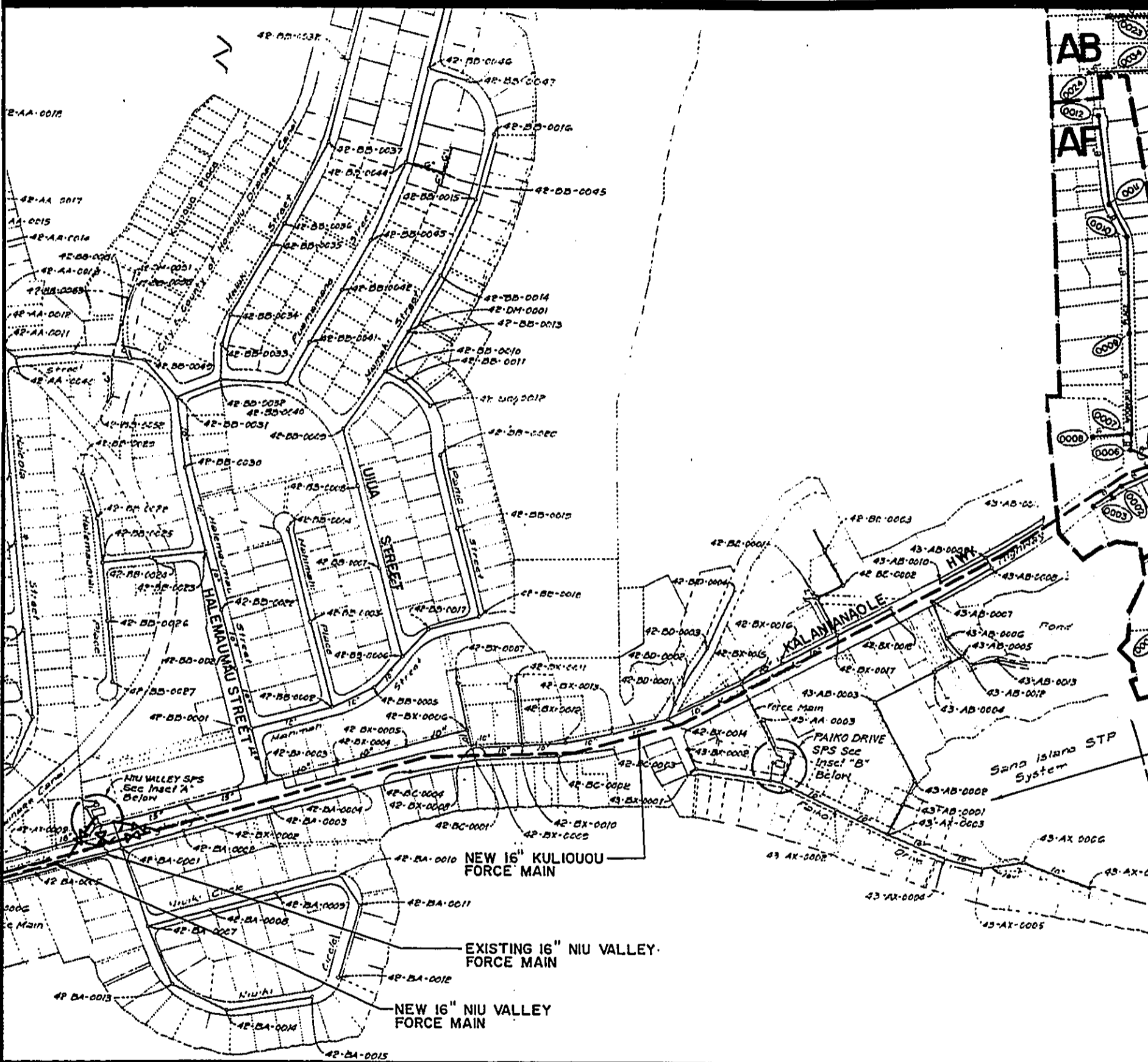


Figure A-96

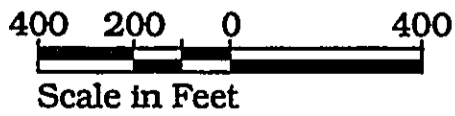
Connecting the Kuliouou WWPS Discharge to the Ala Moana Wastewater Collection System and Niu Valley New Force Main



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN

BELT COLLINS HAWAII • DECEMBER 1993



North

Conr
Waste

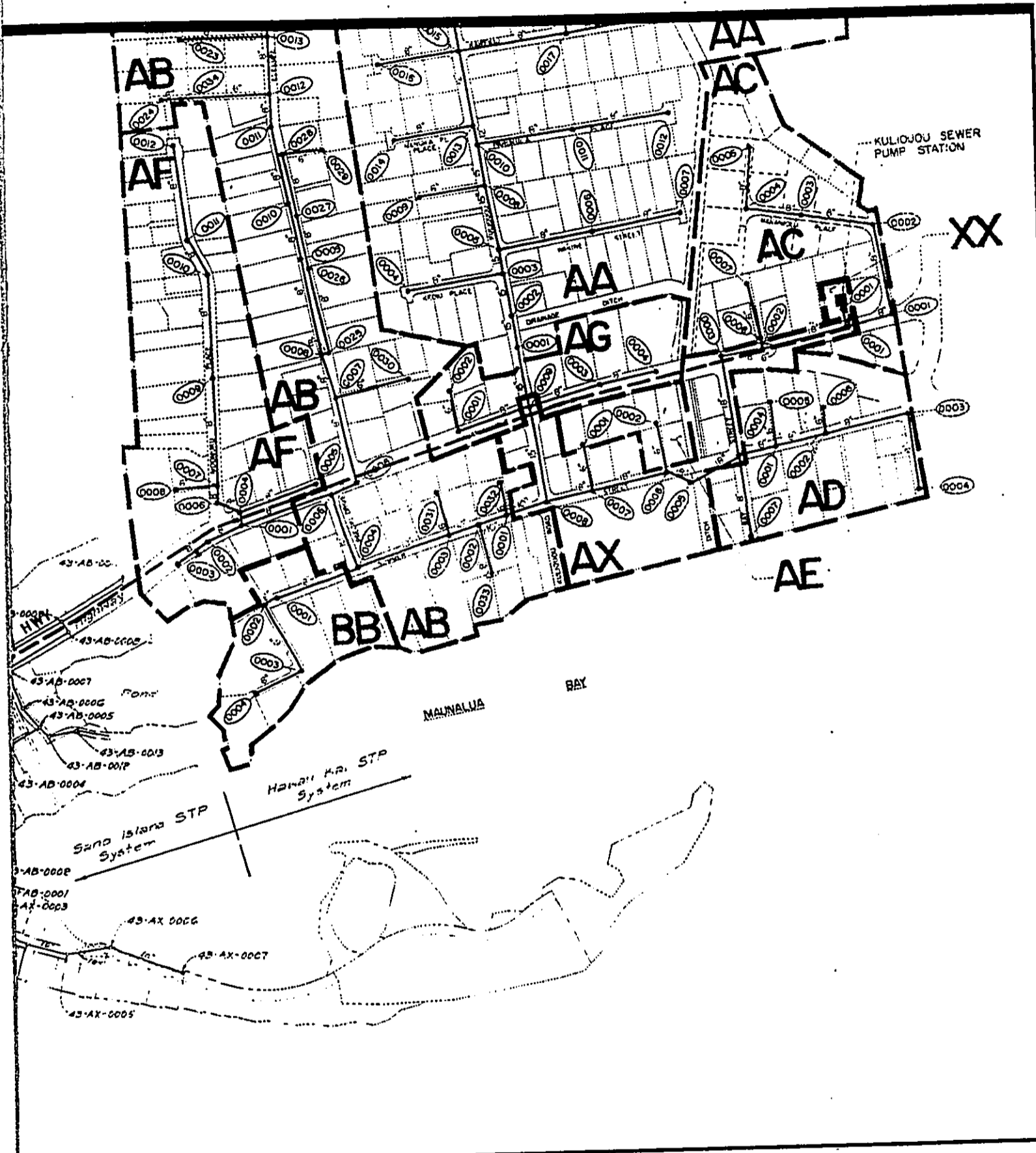
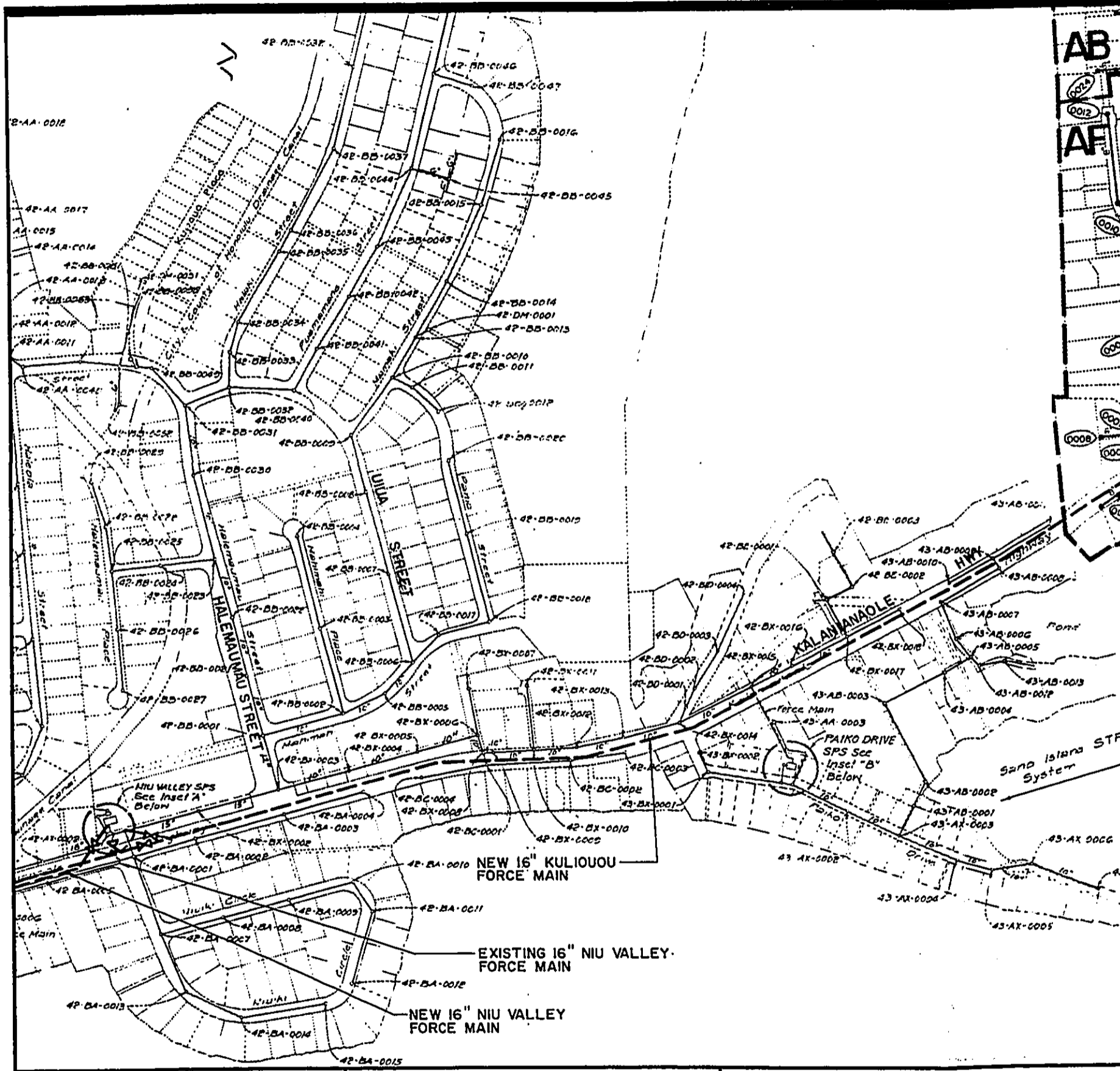


Figure A-97
 Connecting the Kuliouou WWPS Discharge to the Ala Moana
 Wastewater Collection System and Niu Valley New Force Main



EAST MAMALA BAY

WASTEWATER FACILITIES PLAN

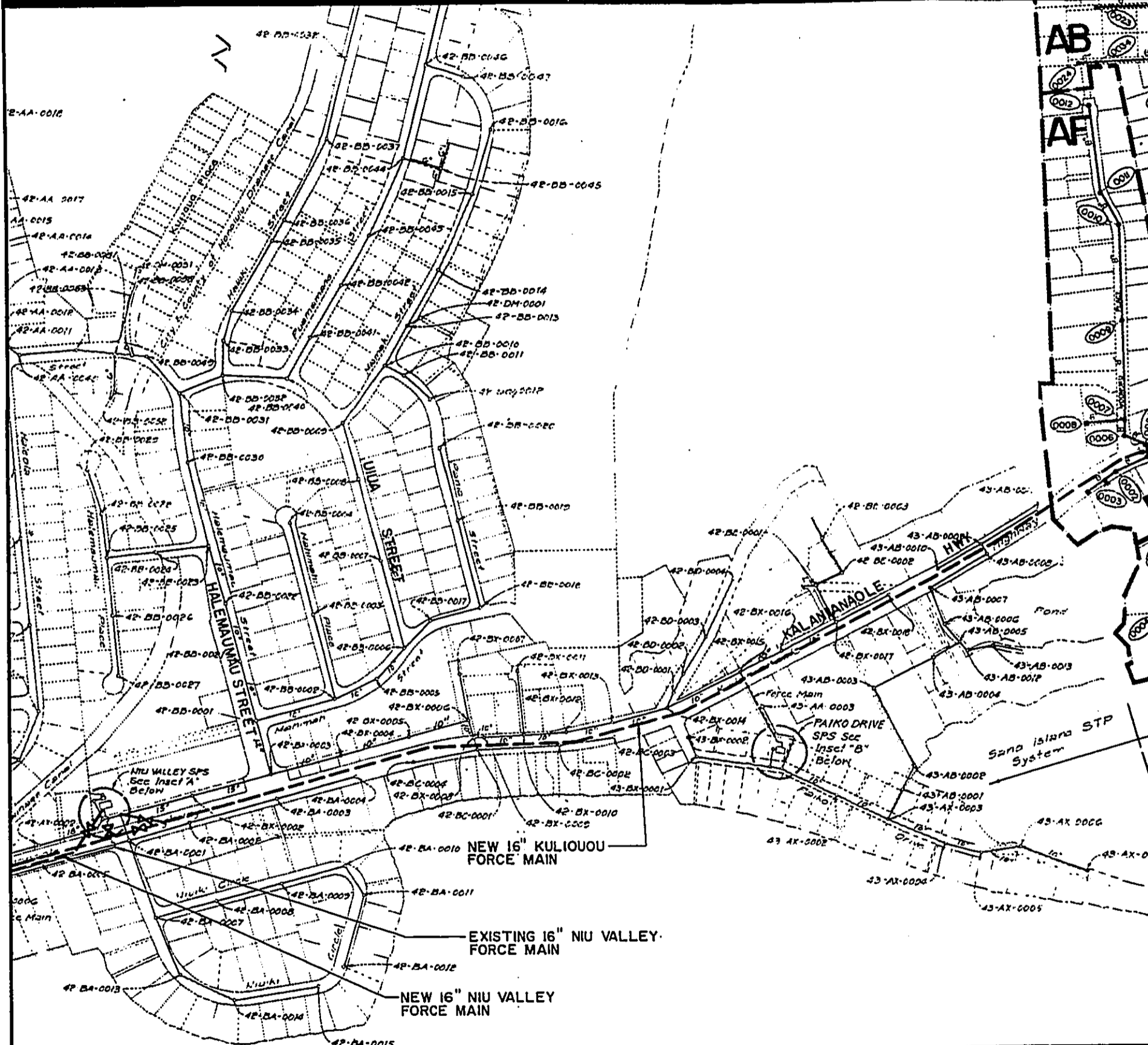
BELT COLLINS HAWAII • DECEMBER 1993



Co
Was

CORRECTION

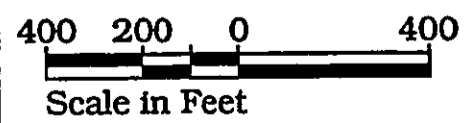
THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING



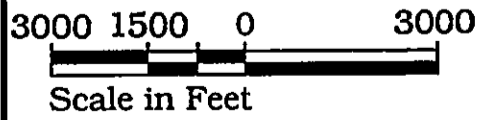
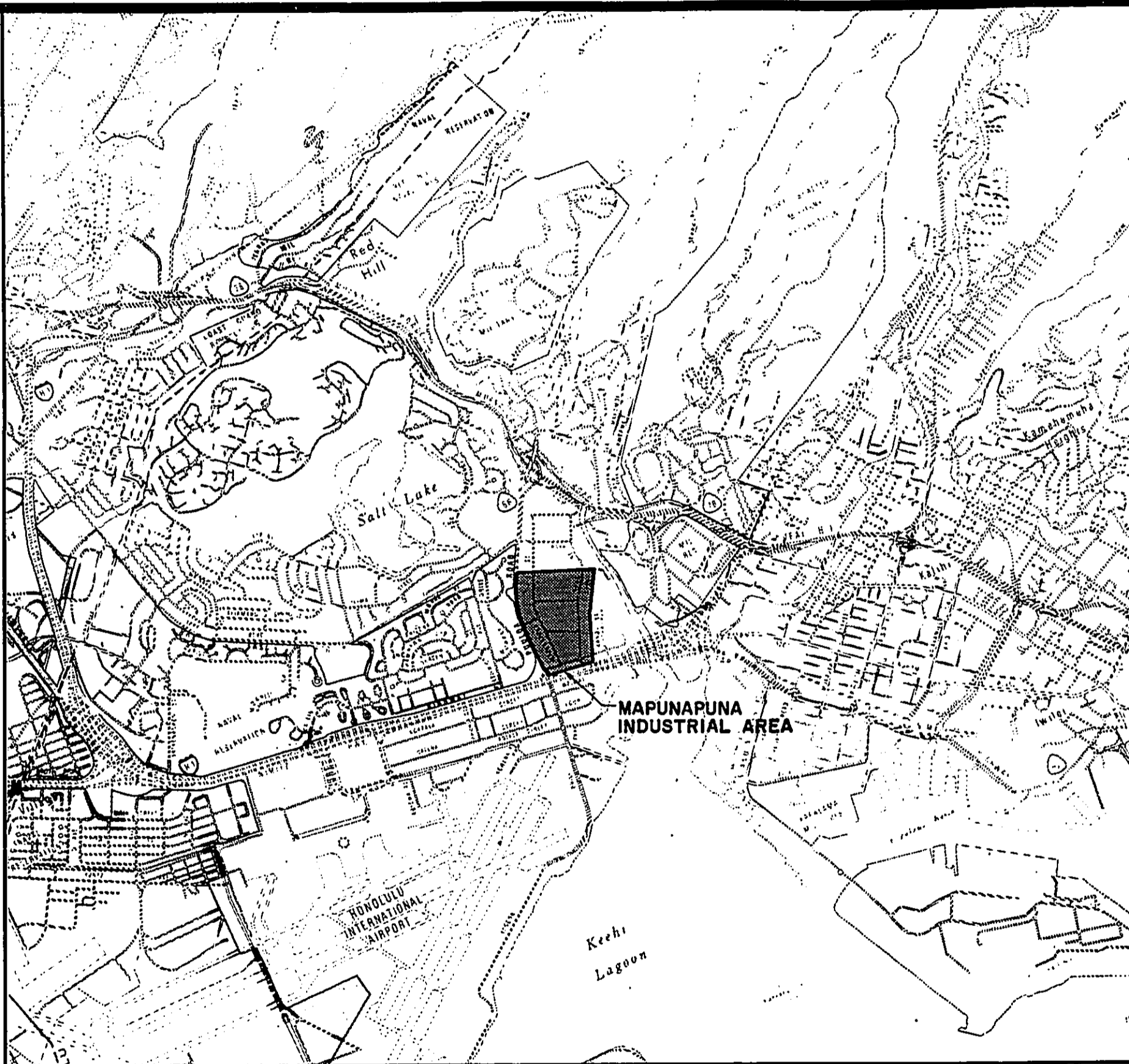
EAST MAMALA BAY

WASTEWATER FACILITIES PLAN

BELT COLLINS HAWAII • DECEMBER 1993



Con
Waste

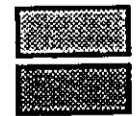


Scale in Feet



North

Legend



Conventional Sewers

IWS Retained

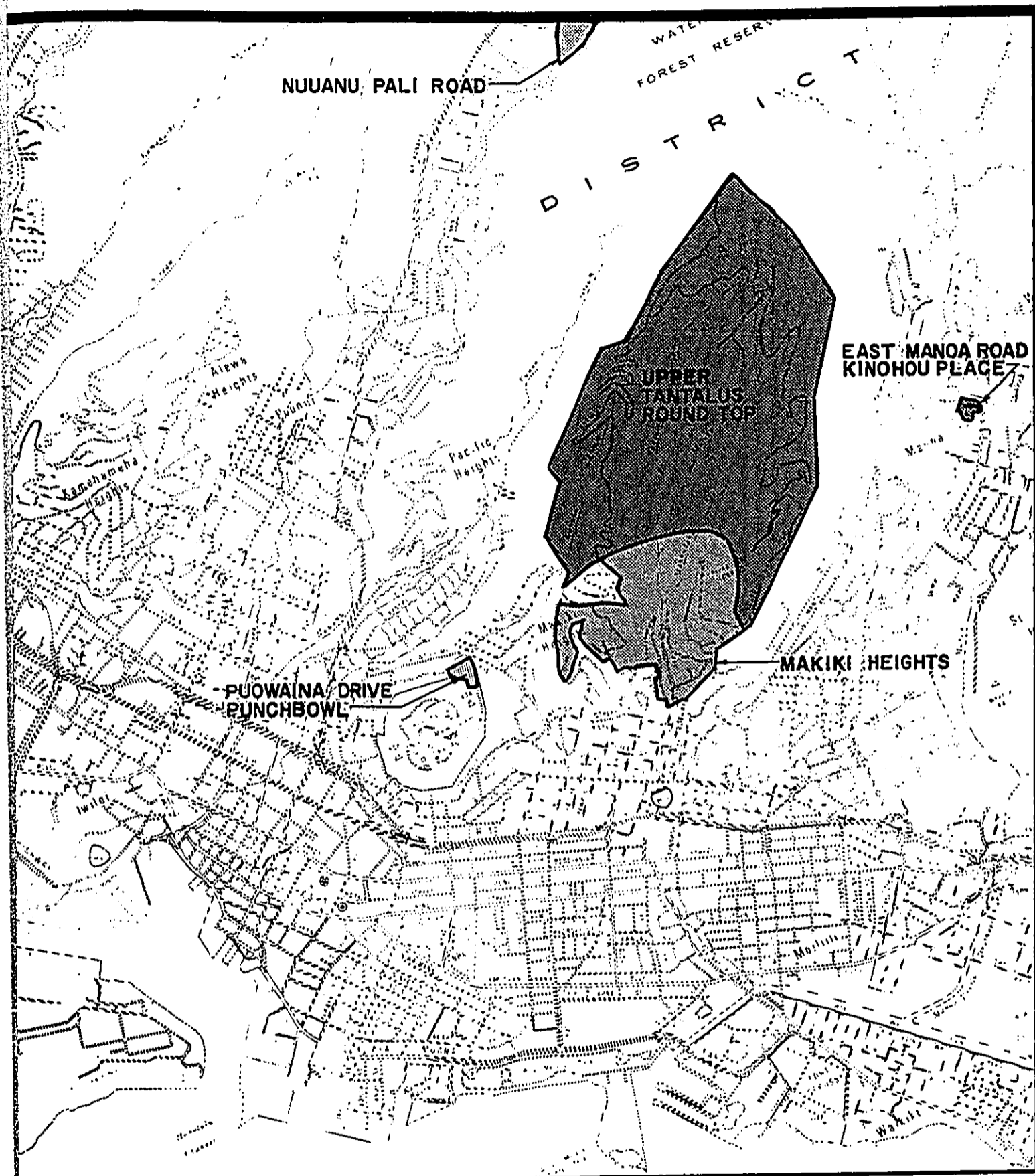
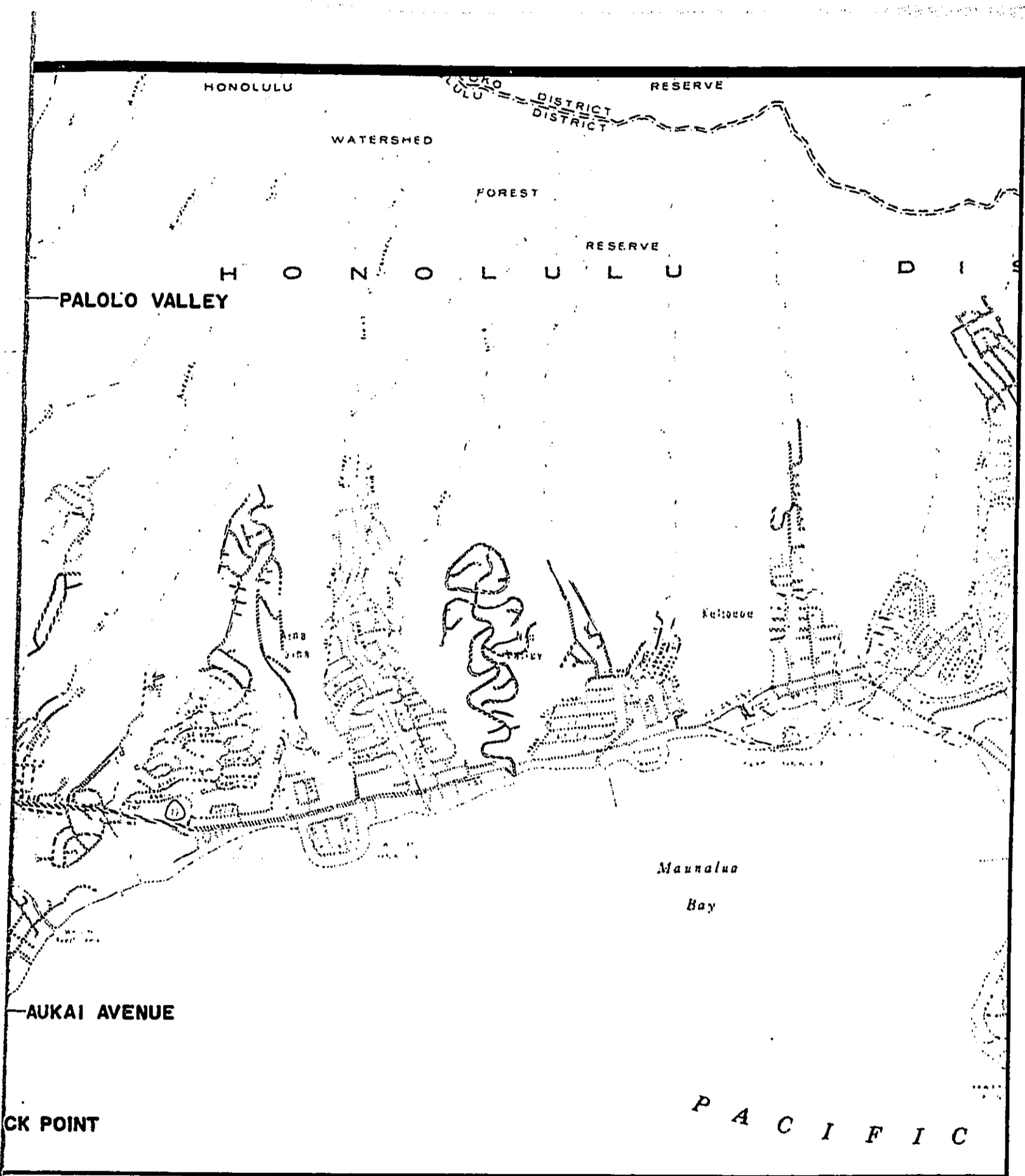


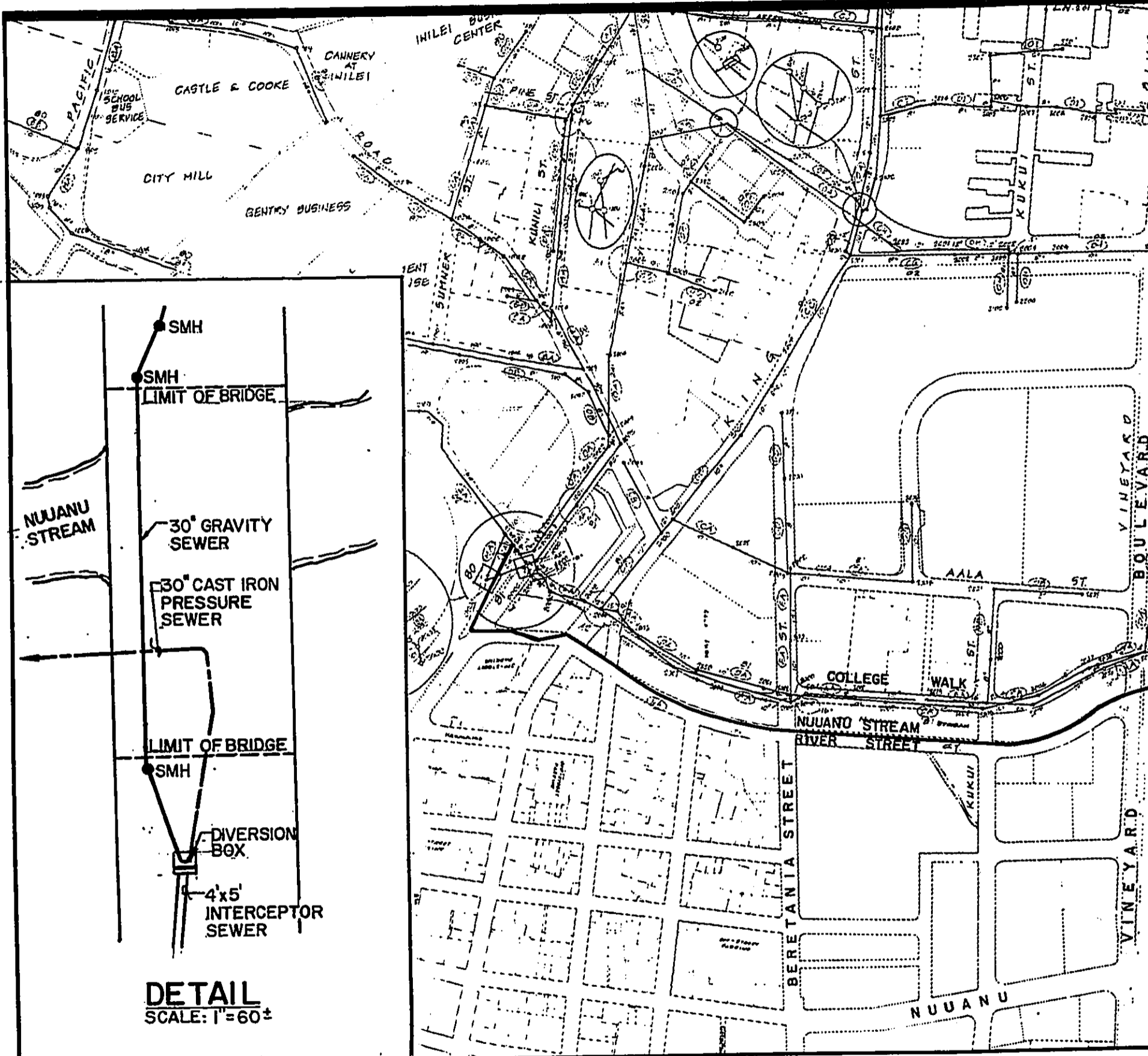
Figure A-98
Collection and Treatment - Unsewered Areas

ers

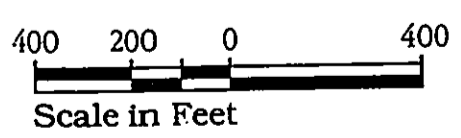


ewers

Figure A-99
Collection and Treatment - Unsewered Areas



EAST MAMALA BAY
 WASTEWATER FACILITIES PLAN
 ENVIRONMENTAL IMPACT STATEMENT
 BELT COLLINS HAWAII • DECEMBER 1993



Elim

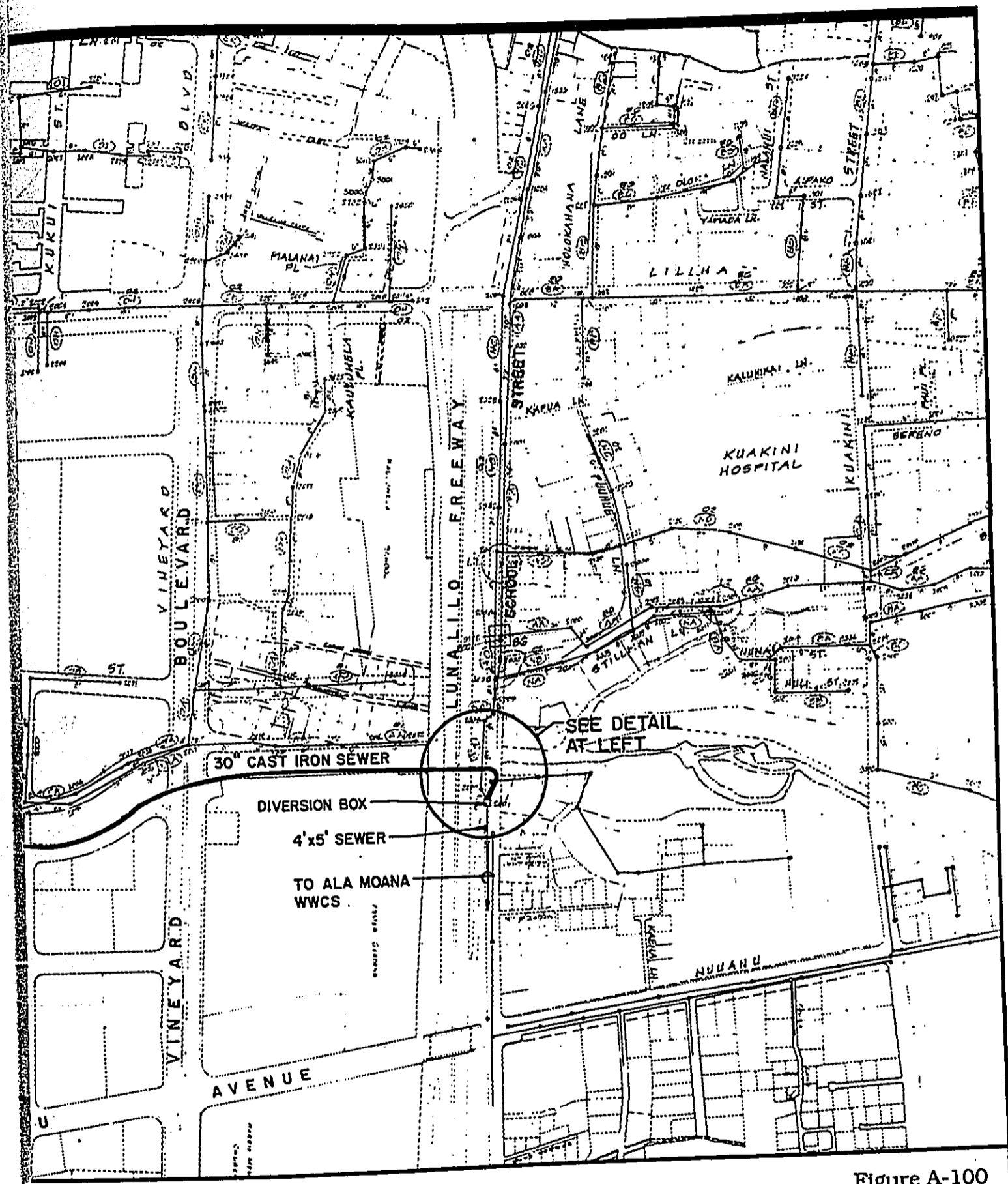


Figure A-100
 Elimination of the 30" Cast Iron Sewer along Nuuanu Stream