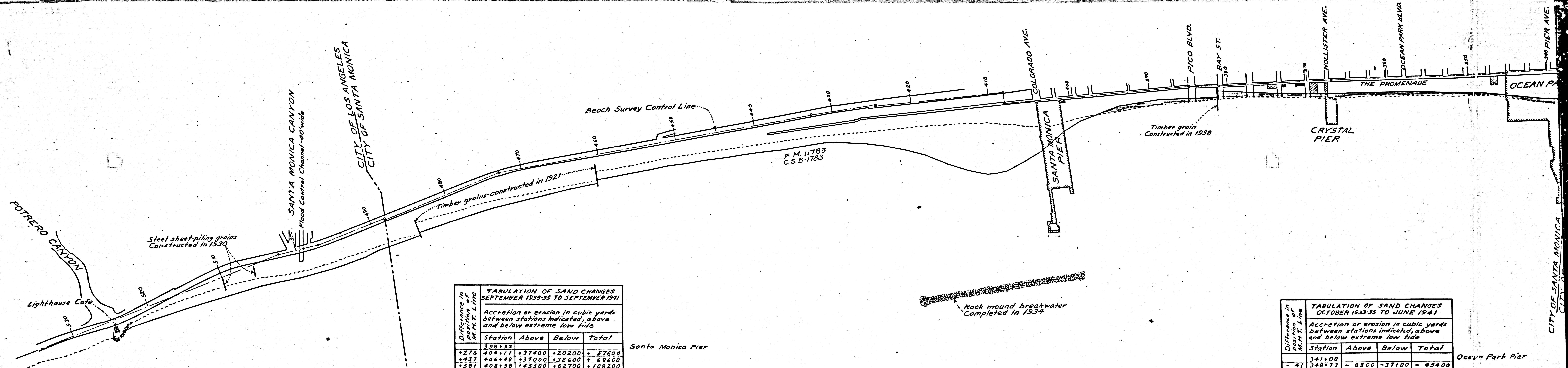
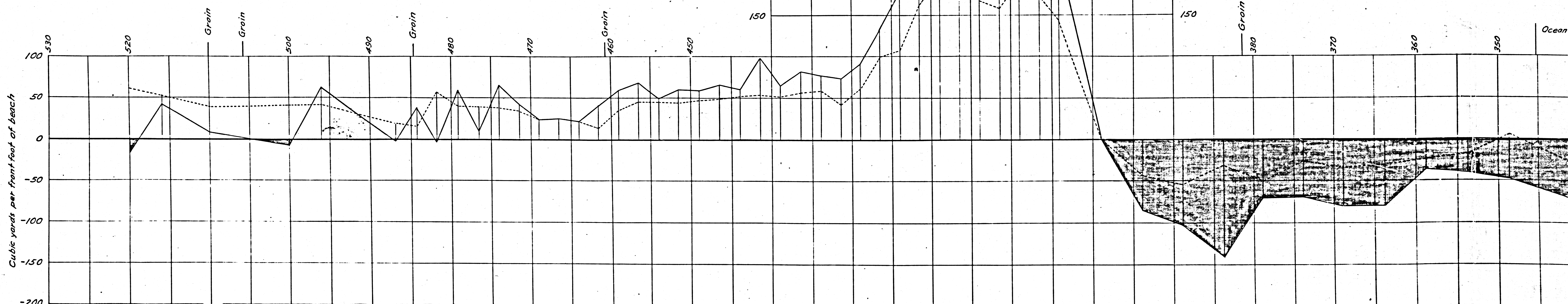
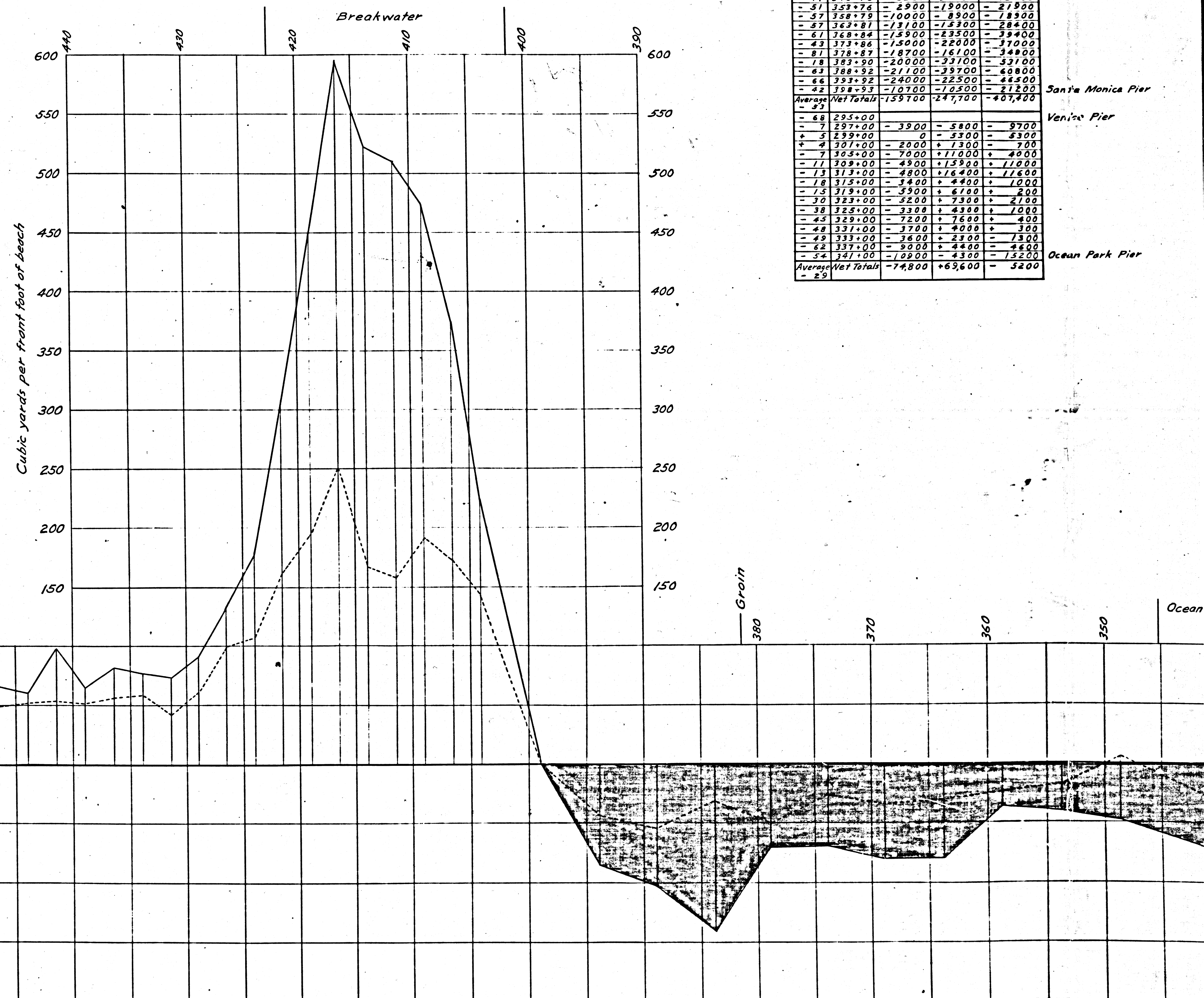




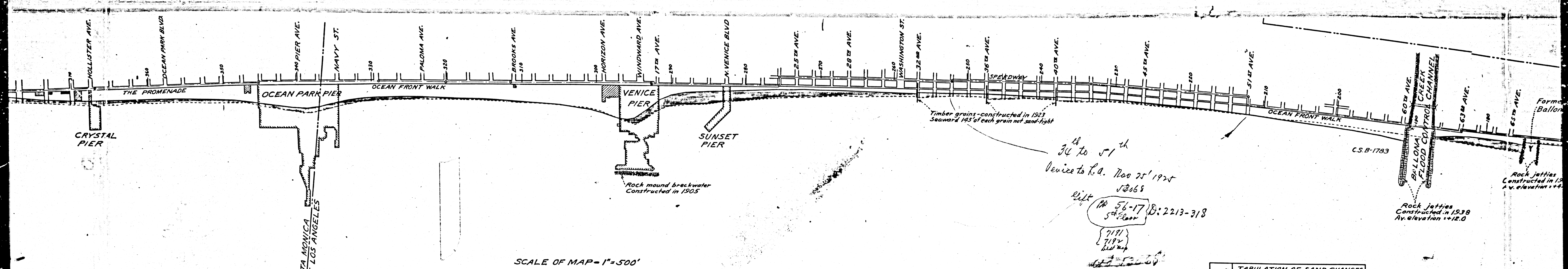
Difference in position of station	Station	Above	Below	Total
+276	404+11	+37400	+20200	+57600
+437	406+48	+37000	+32600	+69600
+581	408+98	+45500	+62700	+108200
+621	411+48	+43700	+81400	+125100
+576	413+98	+40800	+88100	+128900
+484	416+48	+52500	+87000	+139500
+367	418+98	+55800	+71800	+127600
+274	421+48	+44700	+46700	+91400
+192	423+98	+33800	+26400	+60400
+147	426+48	+22900	+7300	+29900
+112	428+98	+20100	+8000	+28100
+106	431+48	+13000	+7700	+20700
+108	432+98	+12700	+6300	+19000
+109	434+48	+14600	+4600	+20200
+104	436+98	+12700	+4900	+18600
+107	441+48	+13300	+8200	+21500
+105	444+98	+13500	+7600	+21100
+102	446+50	+12700	+5100	+17800
+103	443+00	+12100	+3600	+15700
+100	451+50	+11600	+3500	+15100
+104	454+01	+11400	+2500	+13900
+102	456+51	+11600	+3300	+14900
+100	459+01	+10300	+2900	+13200
+37	461+51	+6300	+4500	+10800
+49	464+02	+4300	+3400	+7900
+64	466+52	+5800	+0	+5800
+74	469+02	+6900	+0	+6900
+86	471+52	+7800	+1100	+8900
+85	474+07	+9200	+4400	+13600
+110	476+68	+9800	+7300	+17100
+115	479+22	+10000	+6400	+16400
+126	481+80	+12400	+5400	+17800
+46	484+38	+9300	+3100	+12400
+66	486+98	+4300	+0	+4300
+87	489+50	+27100	+500	+27600
+89	500+00	+16400	+3800	+20200
+118	510+00	+40500	+39000	+79500
+128	516+00	+27600	+12300	+39900
+99	520+00	+22800	+18000	+40800
+171	Average Net Total	+807200	+343300	+1,150,500

Note: Within the limits of Santa Monica the beach and offshore profiles were taken parallel to the prolonged center line of Colorado Ave. At all other points they were taken at right angles to the Beach Survey Control Line.

Difference in position of station	Station	Above	Below	Total
-41	341+00	-8300	-37100	-45400
-51	353+76	-2900	-19000	-21900
-57	358+79	-10000	-8900	-18900
-57	363+81	-13100	-14300	-27400
-61	368+84	-15900	-23500	-39400
-43	373+86	-15000	-22000	-37000
-81	378+87	-18700	-16100	-34800
-18	383+90	-20000	-9100	-29100
-63	388+92	-21100	-39700	-60800
-66	393+92	-24000	-22500	-46500
-42	398+93	-10700	-10500	-21200
Average Net Total		-159700	-247700	-407400
-68	295+00	-3900	-5800	-9700
-7	297+00	-0	-5300	-5300
+5	299+00	-0	-5300	-5300
+4	301+00	-2000	+1300	-700
-7	303+00	-7000	+11000	+4000
-11	305+00	-4900	+13900	+10000
-13	313+00	-4800	+16400	+11600
-18	315+00	-3400	+4400	+1000
-15	319+00	-3500	+4100	+600
-30	323+00	-3200	+7300	+4100
-38	325+00	-3300	+4300	+1000
-45	329+00	-7200	+7400	+200
-48	331+00	-3700	+4000	+300
-49	333+00	-3600	+2300	-1300
-62	337+00	-9000	+4400	-4600
-54	341+00	-19000	+4300	-14700
-29	Average Net Total	-74800	+65600	-9200



F.M. 111768
A1 OF A4



TABULATION OF SAND CHANGES OCTOBER 1933-35 TO JUNE 1941

Accretion or erosion in cubic yards between stations indicated, above and below extreme low tide

Station	Above	Below	Total
341+00	-	-	-
342+75	-8500	-37100	-45600
343+75	-2900	-19000	-21900
344+75	-10000	-8900	-18900
345+75	-13100	-75300	-88400
346+75	-15000	-23500	-38500
347+75	-15000	-22500	-37500
348+75	-18700	-16100	-34800
349+75	-20000	-33100	-53100
350+75	-21100	-39700	-60800
351+75	-24000	-22500	-46500
352+75	-70500	-70500	-141000
353+75	-139700	-247700	-387400
354+75	-	-	-
355+00	-3900	-5800	-9700
356+00	-	-5300	-5300
357+00	-2000	-1300	-3300
358+00	-7000	-11000	-18000
359+00	-4900	-15200	-20100
360+00	-4800	-16400	-21200
361+00	-4400	-4400	-8800
362+00	-3900	-6760	-10660
363+00	-2800	-7300	-10100
364+00	-3300	-4300	-7600
365+00	-2200	-7600	-9800
366+00	-3700	-4000	-7700
367+00	-3800	-2300	-6100
368+00	-9000	-4400	-13400
369+00	-10900	-4300	-15200
370+00	-74800	+69600	-5200

Ocean Park Pier

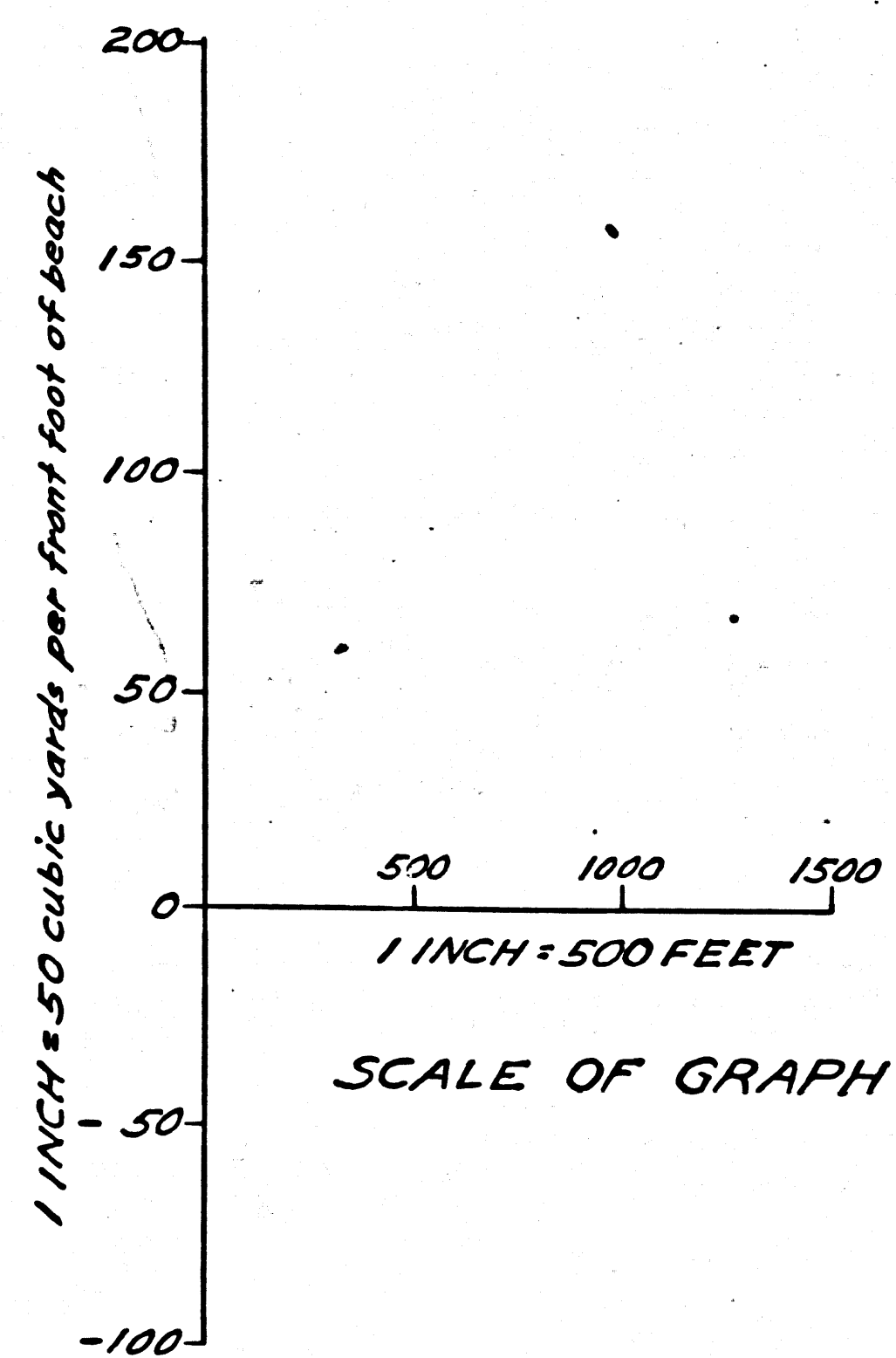
Santa Monica Pier

Venice Pier

Ocean Park Pier

Mean High Tide Lines

October 1933-N.W. to S.E. boundary of Santa Monica
 September-October 1935-Santa Monica to El Segundo
 September 1935-Potrero Canyon to Santa Monica
 June 1941-Santa Monica Pier to El Segundo
 September 1941-Potrero Canyon to Santa Monica Pier
 August 1938-El Segundo to Ballona Creek



SCALE OF GRAPH

CITY OF LOS ANGELES

LLOYD ALDRICH-CITY ENGINEER

BEACH PROTECTION AND DEVELOPMENT STUDIES

MAP SHOWING CHANGES IN THE MEAN HIGH TIDE LINE BETWEEN POTRERO CANYON AND THE NORTH CITY BOUNDARY OF EL SEGUNDO AND A GRAPH SHOWING THE NET GAIN OR LOSS OF SAND BETWEEN THE SAME LIMITS FROM 1933-1935 TO 1941

The graph is based on a comparison of surveys made in June and September of 1941 with surveys made in Santa Monica in October 1933, before the breakwater was begun, and surveys made northwest and southeast of Santa Monica in September and October 1935, before the breakwater had any effect in those areas. Thus the graph shows the net effect of the Santa Monica breakwater, the Ballona Creek jetties, and the sand-slucing and grain construction at Hyperion.

In the graph the area between the dotted line and the O-O line represents the accretion or erosion above extreme low tide level at each point along the beach, between the dates above. The area between the solid line and the O-O line represents the combined accretion or erosion above and below extreme low tide. The changes below extreme low tide usually do not extend more than 500 feet seaward of the original extreme low tide line.

The area above the O-O line represents accretion and the area below the line represents erosion.

The survey profiles on which the data are based extended from the inner portion of the beach to elevation minus 25 below mean lower low water.

In the portion of the graph for the beach between El Segundo and the former outlet of Ballona Creek the area between the O-O line and the line represents the accretion or erosion above extreme low tide level at each point along the beach, from October 1935 to August 1938. The area between the O-O line and the line represents the combined accretion or erosion above and below extreme low tide, from October 1935 to August 1938.

In the tabulations herein the plus (+) and minus (-) signs indicate accretion and erosion, respectively. Elevations given herein refer to Mean Lower Low Water Datum.

Compiled by A.G. Johnson
 March, 1942
 F.M. 11768
 C.S.B-1768

TABULATION OF SAND CHANGES OCTOBER 1935 TO JUNE 1941

Accretion or erosion in cubic yards between stations indicated, above and below extreme low tide

Station	Above	Below	Total
103	175+00	-	-
104	178+00	-19800	-6300
105	180+00	-4500	-600
106	182+00	-14000	-3000
107	184+00	-11500	-8100
108	186+00	-8700	-3100
Average	Net Totals	-68900	-18000
109	188+00	-	-
110	190+00	-30200	-30200
111	192+00	-9300	-19200
112	194+00	-9300	-21600
113	196+00	-5600	-12300
114	198+00	-4500	-19200
115	200+00	-3000	-16700
116	202+00	-3200	-16900
117	204+00	-1900	-29000
118	206+00	-1100	-20800
119	208+00	-100	-8900
120	210+00	-100	-8900
121	212+00	-100	-8900
122	214+00	-100	-8900
123	216+00	-100	-8900
124	218+00	-100	-8900
125	220+00	-100	-8900
126	222+00	-100	-8900
127	224+00	-100	-8900
128	226+00	-100	-8900
129	228+00	-100	-8900
130	230+00	-100	-8900
131	232+00	-100	-8900
132	234+00	-100	-8900
133	236+00	-100	-8900
134	238+00	-100	-8900
135	240+00	-100	-8900
136	242+00	-100	-8900
137	244+00	-100	-8900
138	246+00	-100	-8900
139	248+00	-100	-8900
140	250+00	-100	-8900
141	252+00	-100	-8900
142	254+00	-100	-8900
143	256+00	-100	-8900
144	258+00	-100	-8900
145	260+00	-100	-8900
146	262+00	-100	-8900
147	264+00	-100	-8900
148	266+00	-100	-8900
149	268+00	-100	-8900
150	270+00	-100	-8900
151	272+00	-100	-8900
152	274+00	-100	-8900
153	276+00	-100	-8900
154	278+00	-100	-8900
155	280+00	-100	-8900
156	282+00	-100	-8900
157	284+00	-100	-8900
158	286+00	-100	-8900
159	288+00	-100	-8900
160	290+00	-100	-8900
161	292+00	-100	-8900
162	294+00	-100	-8900
163	296+00	-100	-8900
164	298+00	-100	-8900
165	300+00	-100	-8900
166	302+00	-100	-8900
167	304+00	-100	-8900
168	306+00	-100	-8900
169	308+00	-100	-8900
170	310+00	-100	-8900
171	312+00	-100	-8900
172	314+00	-100	-8900
173	316+00	-100	-8900
174	318+00	-100	-8900
175	320+00	-100	-8900
176	322+00	-100	-8900
177	324+00	-100	-8900
178	326+00	-100	-8900
179	328+00	-100	-8900
180	330+00	-100	-8900
181	332+00	-100	-8900
182	334+00	-100	-8900
183	336+00	-100	-8900
184	338+00	-100	-8900
185	340+00	-100	-8900
186	342+00	-100	-8900
187	344+00	-100	-8900
188	346+00	-100	-8900
189	348+00	-100	-8900
190	350+00	-100	-8900
191	352+00	-100	-8900
192	354+00	-100	-8900
193	356+00	-100	-8900
194	358+00	-100	-8900
195	360+00	-100	-8900
196	362+00	-100	-8900
197	364+00	-100	-8900
198	366+00	-100	-8900
199	368+00	-100	-8900
200	370+00	-100	-8900
Average	Net Totals	-134900	+67000

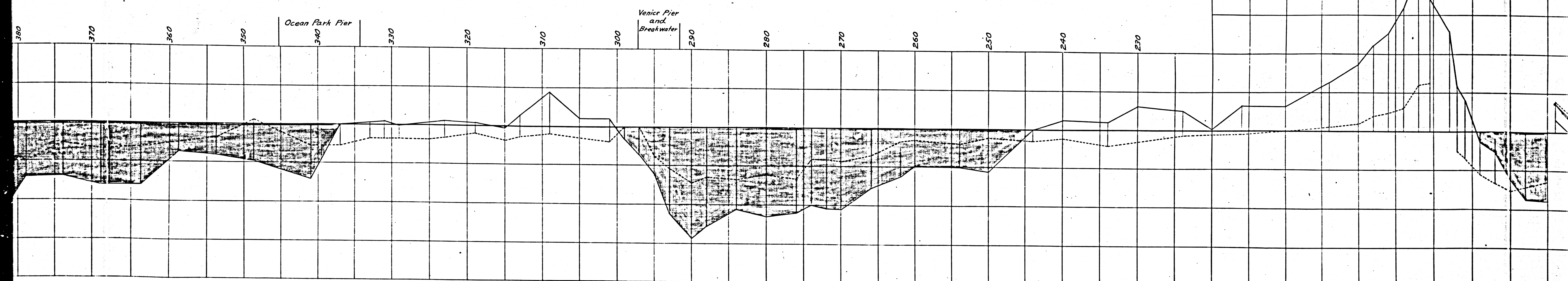
Former outlet of Ballona Creek

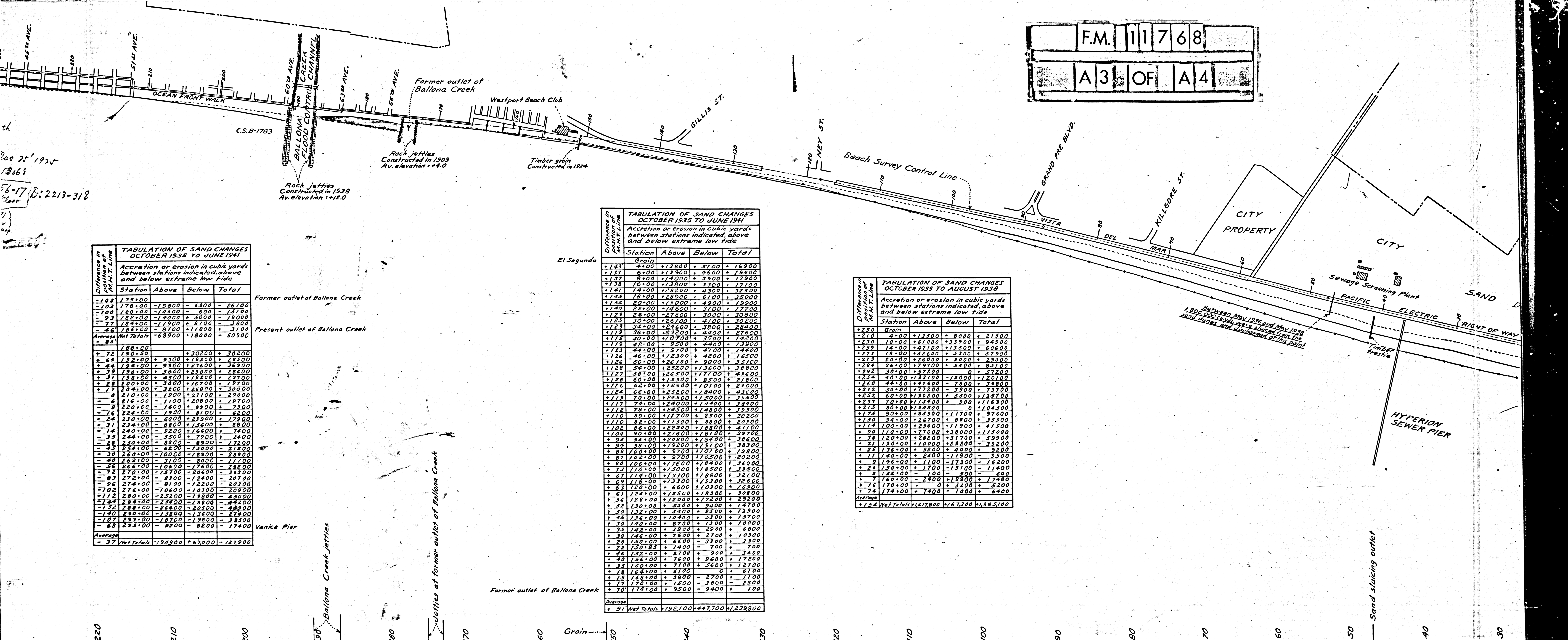
Present outlet of Ballona Creek

Venice Pier

Ballona Creek jetties

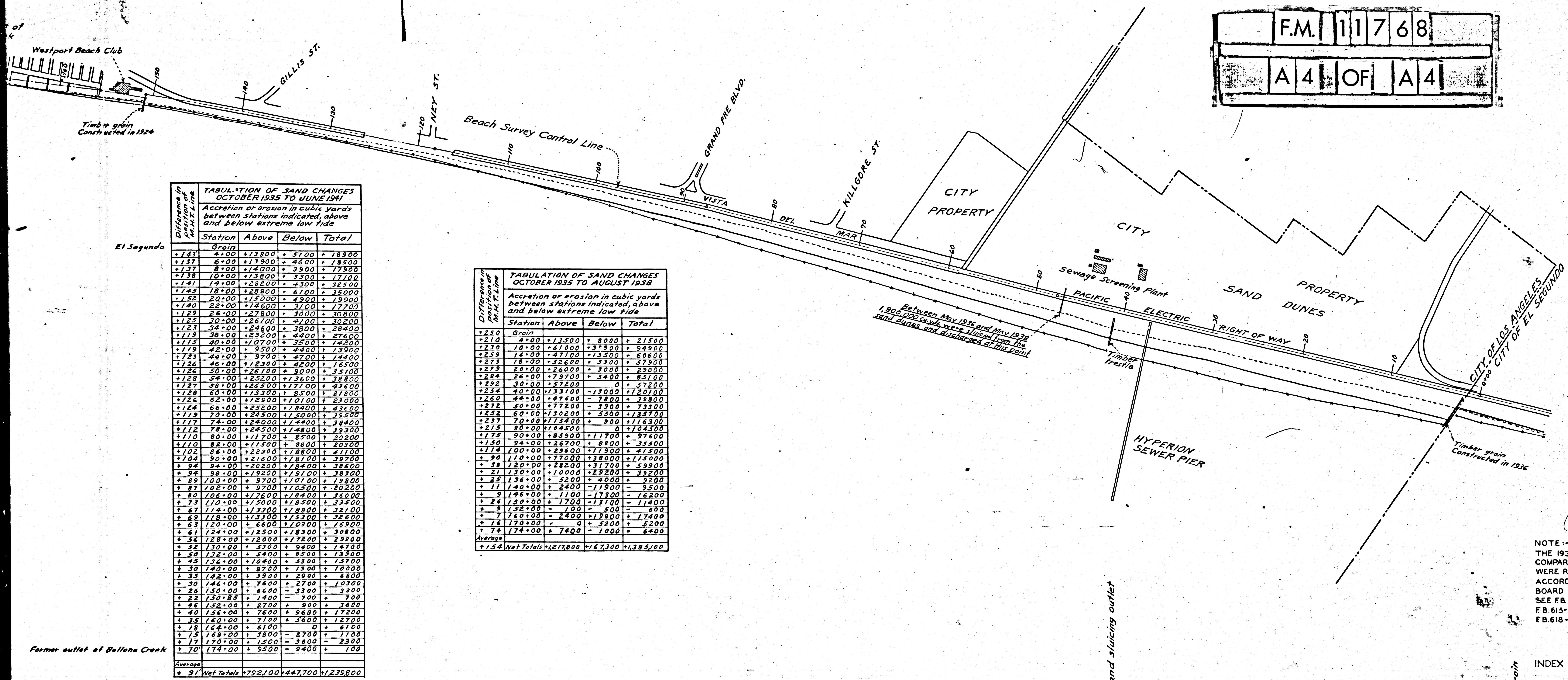
Jetties at former outlet of Ballona Creek





Difference in RIGHT- LINE	TABULATION OF SAND CHANGES OCTOBER 1935 TO JUNE 1941			
	Accretion or erosion in cubic yards between stations indicated, above and below extreme low tide			
	Station	Above	Below	Total
-103	175+00			
-103	178+00	-19800	-6300	-26100
-100	180+00	-14500	-600	-15100
-97	182+00	-14000		-13700
-94	184+00	-11900	8100	-3800
-91	186+00	-8700	+11800	+3100
Average	Net Totals	-68900	+18000	-50900
-85	188+00			
-82	190+00		+30200	+30200
-79	192+00	+9300	+19200	+28500
-76	194+00	+9300	+27600	+36900
-73	196+00	+5600	+63000	+28600
-70	198+00	-4500	+19200	+13700
-67	200+00	+3000	+6700	+9700
-64	202+00	+3200	+26800	+30000
-61	204+00		+16700	+16700
-58	206+00	-100	+20800	+19700
-55	208+00	-1600	+8300	+7300
-52	210+00	-25600		-25600
-49	212+00	-6000	+2300	-3700
-46	214+00	-6800	+3400	-3400
-43	216+00	-9200	+16400	+7400
-40	218+00	-8300	+2400	-5900
-37	220+00	-8500	-8900	-17200
-34	222+00	-6200	-15000	-21200
-31	224+00	-7800	-18900	-26700
-28	226+00	-3100	-8000	-11700
-25	228+00	-10600	-17600	-28200
-22	230+00	-10600	-17600	-28200
-19	232+00	-8300	-12400	-20700
-16	234+00	8100	-12200	-20300
-13	236+00	10600	-10300	-2000
-10	238+00	2800	-2800	0
-7	240+00	-23400	-18800	-42200
-4	242+00	-24400	-20500	-44900
-1	244+00	-17800	-18900	-36700
2	246+00	-18700	-19800	-38500
5	248+00	-9200	-8200	-17400
Average	Net Totals	-34400	+67000	+23600

F.M. 11768
A 4 OF A 4



TABULATION OF SAND CHANGES OCTOBER 1935 TO JUNE 1941

Accretion or erosion in cubic yards between stations indicated, above and below extreme low tide

Station	Above	Below	Total
121	4100	13800	18900
122	6100	13900	20000
123	8100	14000	22100
124	10100	13800	23900
125	12100	13200	25300
126	14100	12600	26700
127	16100	12000	28100
128	18100	11400	29500
129	20100	10800	30900
130	22100	10200	32300
131	24100	9600	33700
132	26100	9000	35100
133	28100	8400	36500
134	30100	7800	37900
135	32100	7200	39300
136	34100	6600	40700
137	36100	6000	42100
138	38100	5400	43500
139	40100	4800	44900
140	42100	4200	46300
141	44100	3600	47700
142	46100	3000	49100
143	48100	2400	50500
144	50100	1800	51900
145	52100	1200	53300
146	54100	600	54700
147	56100	0	56100
148	58100	0	58100
149	60100	0	60100
150	62100	0	62100
151	64100	0	64100
152	66100	0	66100
153	68100	0	68100
154	70100	0	70100
155	72100	0	72100
156	74100	0	74100
157	76100	0	76100
158	78100	0	78100
159	80100	0	80100
160	82100	0	82100
161	84100	0	84100
162	86100	0	86100
163	88100	0	88100
164	90100	0	90100
165	92100	0	92100
166	94100	0	94100
167	96100	0	96100
168	98100	0	98100
169	100100	0	100100
170	102100	0	102100
171	104100	0	104100
172	106100	0	106100
173	108100	0	108100
174	110100	0	110100
175	112100	0	112100
176	114100	0	114100
177	116100	0	116100
178	118100	0	118100
179	120100	0	120100
180	122100	0	122100
181	124100	0	124100
182	126100	0	126100
183	128100	0	128100
184	130100	0	130100
185	132100	0	132100
186	134100	0	134100
187	136100	0	136100
188	138100	0	138100
189	140100	0	140100
190	142100	0	142100
191	144100	0	144100
192	146100	0	146100
193	148100	0	148100
194	150100	0	150100
195	152100	0	152100
196	154100	0	154100
197	156100	0	156100
198	158100	0	158100
199	160100	0	160100
200	162100	0	162100
201	164100	0	164100
202	166100	0	166100
203	168100	0	168100
204	170100	0	170100
205	172100	0	172100
206	174100	0	174100
207	176100	0	176100
208	178100	0	178100
209	180100	0	180100
210	182100	0	182100
211	184100	0	184100
212	186100	0	186100
213	188100	0	188100
214	190100	0	190100
215	192100	0	192100
216	194100	0	194100
217	196100	0	196100
218	198100	0	198100
219	200100	0	200100
220	202100	0	202100
221	204100	0	204100
222	206100	0	206100
223	208100	0	208100
224	210100	0	210100
225	212100	0	212100
226	214100	0	214100
227	216100	0	216100
228	218100	0	218100
229	220100	0	220100
230	222100	0	222100
231	224100	0	224100
232	226100	0	226100
233	228100	0	228100
234	230100	0	230100
235	232100	0	232100
236	234100	0	234100
237	236100	0	236100
238	238100	0	238100
239	240100	0	240100
240	242100	0	242100
241	244100	0	244100
242	246100	0	246100
243	248100	0	248100
244	250100	0	250100
245	252100	0	252100
246	254100	0	254100
247	256100	0	256100
248	258100	0	258100
249	260100	0	260100
250	262100	0	262100
251	264100	0	264100
252	266100	0	266100
253	268100	0	268100
254	270100	0	270100
255	272100	0	272100
256	274100	0	274100
257	276100	0	276100
258	278100	0	278100
259	280100	0	280100
260	282100	0	282100
261	284100	0	284100
262	286100	0	286100
263	288100	0	288100
264	290100	0	290100
265	292100	0	292100
266	294100	0	294100
267	296100	0	296100
268	298100	0	298100
269	300100	0	300100
270	302100	0	302100
271	304100	0	304100
272	306100	0	306100
273	308100	0	308100
274	310100	0	310100
275	312100	0	312100
276	314100	0	314100
277	316100	0	316100
278	318100	0	318100
279	320100	0	320100
280	322100	0	322100
281	324100	0	324100
282	326100	0	326100
283	328100	0	328100
284	330100	0	330100
285	332100	0	332100
286	334100	0	334100
287	336100	0	336100
288	338100	0	338100
289	340100	0	340100
290	342100	0	342100
291	344100	0	344100
292	346100	0	346100
293	348100	0	348100
294	350100	0	350100
295	352100	0	352100
296	354100	0	354100
297	356100	0	356100
298	358100	0	358100
299	360100	0	360100
300	362100	0	362100
301	364100	0	364100
302	366100	0	366100
303	368100	0	368100
304	370100	0	370100
305	372100	0	372100
306	374100	0	374100
307	376100	0	376100
308	378100	0	378100
309	380100	0	380100
310	382100	0	382100
311	384100	0	384100
312	386100	0	386100
313	388100	0	388100
314	390100	0	390100
315	392100	0	392100
316	394100	0	394100
317	396100	0	396100
318	398100	0	398100
319	400100	0	400100
320	402100	0	402100
321	404100	0	404100
322	406100	0	406100
323	408100	0	408100
324	410100	0	410100
325	412100	0	412100
326	414100	0	414100
327	416100	0	416100
328	418100	0	418100
329	420100	0	420100
330	422100	0	422100
331	424100	0	424100
332	426100	0	426100
333	428100	0	428100
334	430100	0	430100
335	432100	0	432100
336	434100	0	434100
337	436100	0	436100
338	438100	0	438100
339	440100	0	440100
340	442100	0	442100
341	444100	0	444100
342	446100	0	446100
343	448100	0	448100
344	450100	0	450100
345	452100	0	452100
346	454100	0	454100
347	456100	0	456100
348	458100	0	458100
349	460100	0	460100
350	462100	0	462100
351	464100	0	464100
352	466100	0	466100
353	468100	0	468100
354	470100	0	470100
355	472100	0	472100
356	474100	0	474100
357	476100	0	476100
358	478100	0	478100
359	480100	0	480100
360	482100	0	482100
361	484100	0	484100
362	486100	0	486100
363	488100	0	488100
364	490100	0	490100
365	492100	0	492100
366	494100	0	494100
367	496100	0	496100
368	498100	0	498100
369	500100	0	500100
370	502100	0	502100
371	504100	0	504100
372	506100	0	506100
373	508100	0	508100
374	510100	0	510100
375	512100	0	512100
376	514100	0	514100
377	516100	0	516100
378	518100	0	518100
379	520100	0	520100
380	522100	0	522100
381	524100	0	524100
382	526100	0	526100
383	528100	0	528100
384	530100	0	530100
385	532100	0	532100
386	534100	0	534100
387	536100	0	536100
388	538100	0	538100
389	540100	0	540100
390	542100	0	542100
391	544100	0	544100
392	546100	0	546100
393	548100	0	548100
394	550100	0	550100
395	552100	0	552100
396	554100	0	554100
397	556100	0	556100
398	558100	0	558100
399	560100	0	560100
400	562100	0	562100
401	564100	0	564100
402	566100	0	566100
403	568100	0	568100
404	570100	0	570100
405	572100	0	572100
406	574100	0	574100
407	576100	0	576100
408	578100	0	578100
409	580100	0	580100
410	582100	0	582100
411	584100	0	584100
412	586100	0	586100
413	588100	0	588100
414	590100	0	590100
415	592100	0	592100
416	594		