MASTER SITE PLAN

FOR THE

PILLAR POINT HARBOR PROJECT

PRINCETON, SAN MATEO COUNTY

CALIFORNIA

FOR

SAN MATEO COUNTY HARBOR COMMISSION

626 JEFFERSON AVENUE

REDWOOD CITY

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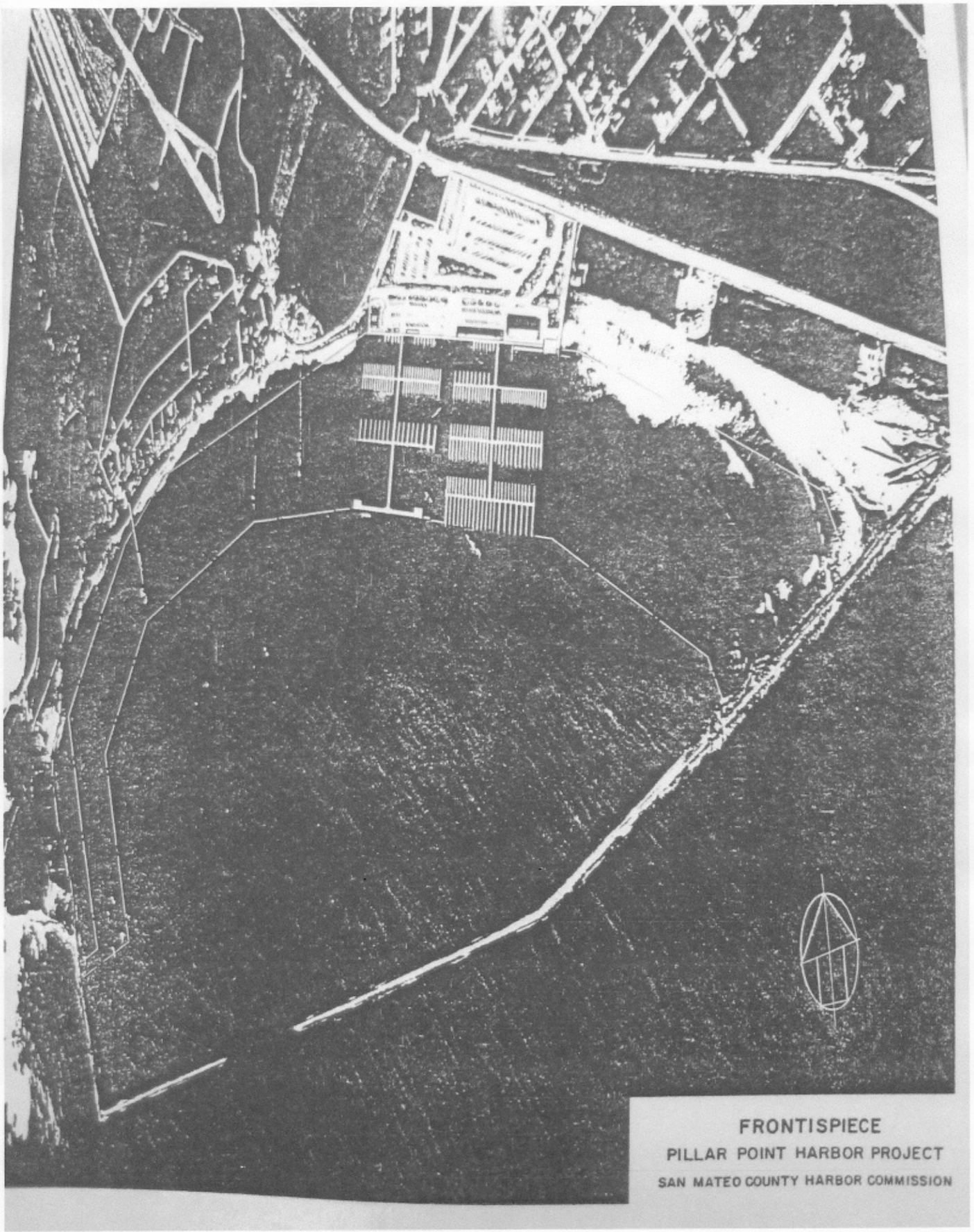
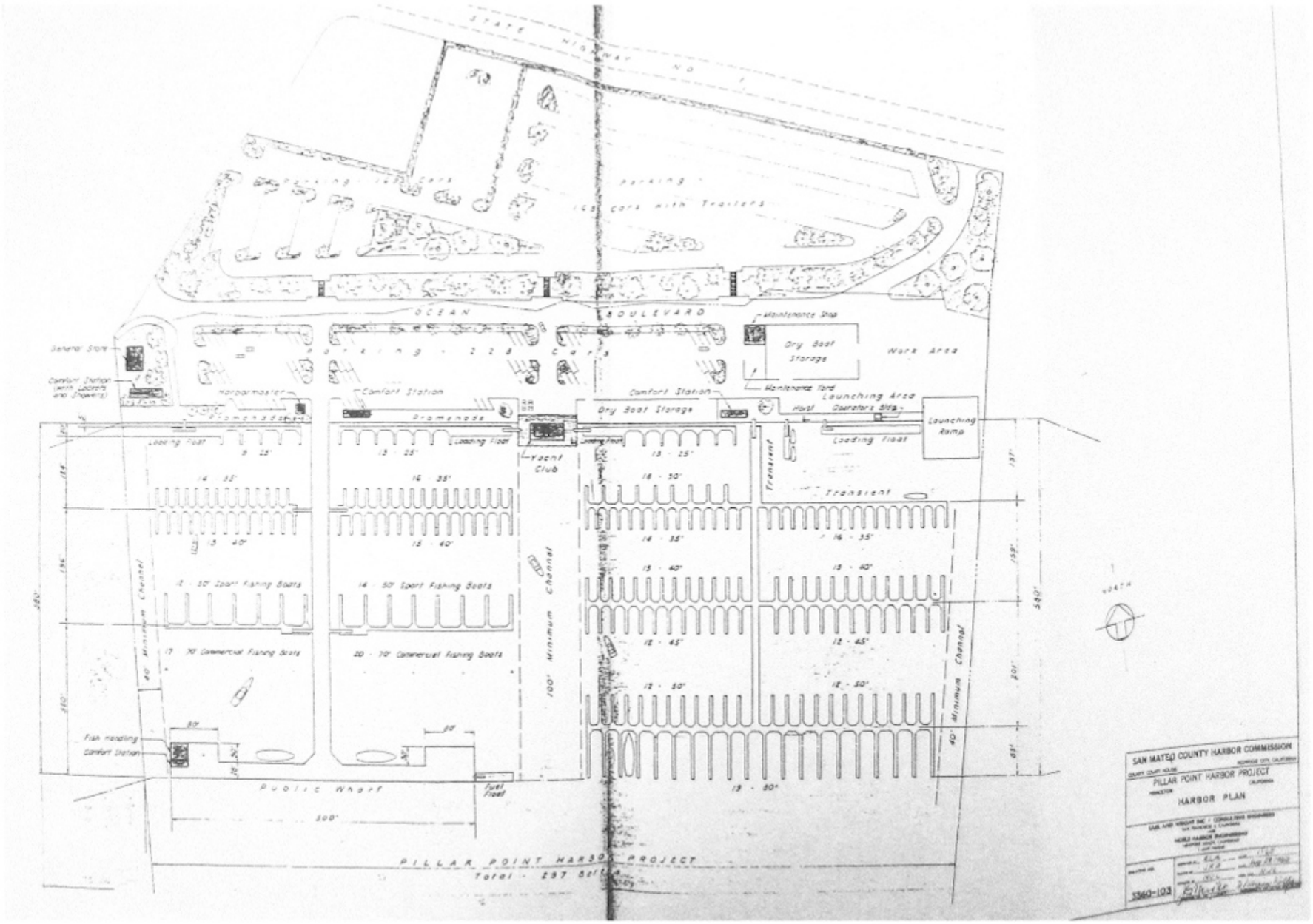


FRONTISPIECE

PILLAR POINT HARBOR PROJECT

SAN MATEO COUNTY HARBOR COMMISSION


STATE HIGHWAY NO. 1
parking 100 cars with Trailers
OCEAN BOULEVARD
Maintenance Shop
Dry Boat Storage
Work Area
Maintenance Yard
Launching Area
Harbormaster
Comfort Station
Promenade
Loading Float
Yacht Club
Transient
Launching Ramp
Harbor Patrol Office
Fish Handling
Public Wharf
Fuel Float
300'
100' Minimum Channel
40' Minimum Channel
PILLAR POINT HARBOR PROJECT
Total - 257 Berths
NORTH
SAN MATEO COUNTY HARBOR COMMISSION
PILLAR POINT HARBOR PROJECT
HARBOR PLAN
3360-103

REPORT ON THE MASTER SITE PLAN

SECTION I. INTRODUCTION

A. Scope of the Report. -

This report proposes a Master Site Plan for the development of small craft facilities on lands owned by the San Mateo County Harbor Commission at Pillar Point Harbor, Princeton, San Mateo County, California. Drawings are presented which indicate an ultimate plan for the facilities, as well as increments of construction by which the project may be accomplished as funds are made available. The initial stages of construction are intended to provide for the more immediate needs of the harbor and to form the basic arrangement from which the project can be enlarged to suit the actual demands for boating facilities as they develop. Cost estimates for the construction increments and discussions of the features of the project are included.

B. Terminology. -

It is necessary in this report to distinguish between that portion of the harbor to be developed by the Harbor Commission and the harbor as a whole. The harbor in its entirety is therefore referred to as "the Pillar Point Harbor" or merely as "the harbor"; whereas the proposed development of the Harbor Commission lands has been termed "the Pillar Point Harbor Project", or "the project".

C. Historical Background. -

The Chief of Engineers, Department of the Army, was authorized by the River and Harbor Act of March 2, 1945 to make a preliminary examination and survey of Pillar Point, Half Moon Bay with regard to the need for harbor improvements. This survey was made by the District Engineer, San Francisco District, Corps of Engineers and a report, dated August 1, 1947, was prepared. Briefly, this report expressed the need for the construction of breakwaters at Pillar Point to provide a harbor for the protection of the fishing fleet, as a haven for small craft in the event of storms and for recreational activities. The report demonstrated that the improvements would be economically justified by tangible benefits, and stated that, in addition, many intangible benefits would accrue. This report with the appropriate endorsements was printed as House Document No. 644 in 1948. The improvements as described in this document were authorized by the River and Harbor Act approved June 30, 1948 by the 80th Congress.

Subsequently, the Congress appropriated funds, the San Francisco District Engineer prepared designs for the breakwaters and determined that the improvements were still justifiable economically, and contracts were let for construction. The District Engineer's designs and conclusions were reported in Design Memorandum No. 1, dated January 1956 and Design Memorandum No. 2, dated April 1957. The breakwaters are now under construction, with completion scheduled for May 31, 1961.

The authorization of the harbor improvements and the appropriation of funds by the Congress was done after assurance was given by the Board of Supervisors of San Mateo County that they would "establish a competent and properly constituted public body, empowered to regulate the use, growth and free development of the harbor facilities with the understanding that such facilities shall be open to all on equal and reasonable terms, and furnish assurances satisfactory to the Secretary of War that they will:

(a) Make available to the United States the right to obtain, free of royalty costs, the necessary stone for the initial construction and future maintenance of the breakwaters from a source or sources acceptable to the District Engineer.

(b) Provide without cost to the United States all necessary lands, easements, and rights-of-way for the construction and maintenance of the project.

(c) Hold and save the United States free from claims for damages due to construction and maintenance of the project.

(d) Provide and maintain without cost to the United States necessary utilities and mooring facilities, including a public landing with suitable supply facilities open to all on equal and reasonable terms, in accordance with plans to be approved by the District Engineer.

(e) Contribute toward the first cost of the improvement the sum of $100,000."

These assurances were given by a resolution adopted by the Board of Supervisors on May 10, 1947. The San Mateo County Harbor Commission has been charged with the responsibility for fulfillment of the requirements by the Federal Government for local cooperation and, on January 16, 1957, adopted a resolution that it would comply with these requirements. The requirement listed as (d) above is the one with which this report is primarily concerned.

SECTION II. PILLAR POINT HARBOR

A. Description of the Harbor Area. -

Pillar Point Harbor is located at the town of Princeton on Half Moon Bay on the west coast of San Mateo County, California, as shown on drawing no. 3360-101. Half Moon Bay is sheltered on the northern end of its crescent shape by Pillar Point which rises 180 feet above the sea. The shoreline trends easterly from Pillar Point to Princeton and then curves southeasterly to Miramontes Point. The bay is approximately 6.5 miles long measured along the curving shoreline. The curvature of the shore is greatest at the northern end and gradually diminishes to the south. The bay is bordered by a sand beach which terminates against a sea cliff cut into terrace deposits and loosely consolidated sediments.

The harbor itself is currently under construction at the north end of Half Moon Bay under the direction of the Corps of Engineers. Pillar Point forms its western protective boundary from which the West Breakwater extends southerly from the point and then easterly. The East Breakwater is being constructed to extend westerly from the sand beach and lines up with the West Breakwater to form the southern barrier of the harbor. A gap is left between the two breakwaters for access to the sheltered area forming the harbor.

B. Tributary Area. -

The harbor is well situated to serve pleasure boat owners of San Mateo County who are interested in boating and sport fishing on the ocean, and is readily accessible to a large portion of the people of the heavily populated Bay Area. The tributary area from which the harbor may expect to draw pleasure boat owners and users of the shore facilities and sport fishing party boats would be most of San Mateo and San Francisco counties, the northern part of Santa Clara County and the southwestern part of Alameda County. This area contains in excess of one million people.

C. Local Uses of the Harbor. -

The principal commercial activities of the Half Moon Bay area which includes the towns of Princeton, El Granada, Miramar and Half Moon Bay are fishing and agriculture. The fishing industry which is concentrated primarily in Princeton includes a commercial fishing fleet, sportfishing party boats, a small cannery, fresh fish markets and restaurants, and bait shops. The tributary fishing grounds extend south from the Golden Gate 35 miles to Pigeon Point and west from the coast about 30 miles to the Farallon Islands. The yield includes fish to be processed, such as shark, and albacore, and fresh market fish such as salmon, crab, bottom fish and rock fish. The improved harbor facilities will, undoubtedly, attract more commercial fishing activity than now exists.

The sheltered harbor in all probability will attract cargo other than fish. Self-propelled small draft vessels and towed barges will be able to deliver such cargoes as petroleum products, lumber and other products.

D. Pierhead and Bulkhead Lines. -

The development of a harbor requires the establishment by the Secretary of the Army on recommendation of the Chief of Engineers, Department of the Army of harbor lines for the protection and preservation of the harbor. These lines consist of a bulkhead line which defines the bayward limit of solid fill and a pierhead line which defines the bayward limit of open structures, such as pile supported piers. The Harbor Commission initiated the procedure by which the harbor lines shown on drawing no. 3360-108 were adopted by the Secretary of the Army in July of 1960. Plates 3 and 4 are copies of the drawings which accompanied their application to the District Engineer.

The lines were chosen to provide adequate space behind the bulkhead line for parking and other facilities related to the harbor. The pierhead line is approximately 600 ft. from the bulkhead, except on the western side of the harbor and was selected to provide sufficient depth for berthing boats without too much dredging. The western side of the harbor will have to be dredged; however, there will be a need for the dredged material as fill behind the bulkhead line. The pierhead line was stopped short of the start of the breakwater on the west side because the area beyond is rather exposed. This area would afford adequate mooring space for small craft seeking temporary refuge from a storm.

E. Relationship of the Harbor to Other Developments in the Vicinity. -

The Cabrillo Highway, State Route 1, parallels the beach on the easterly side of the harbor and is three to four hundred feet eastward from the sea cliff. The highway is now a two-lane, paved road. The State Division of Highways has been authorized to develop the road as an expressway and eventually a freeway; however, no studies have as yet been made. The Division anticipates that as the traffic demand increases, the highway will be improved to a four-lane expressway with grade crossings and ultimately to a freeway with limited access at grade separation structures. The exact locations of points of access are dependent upon conditions as they may be at the time the highway is improved.

The Half Moon Bay Airport is located north of the harbor and the town of Princeton, as shown on Plate 2. The runway approach zone of the airport extends directly over the harbor but the clear zone is sufficiently high not to affect ordinary structures.

F. Lands Owned by the Harbor District. -

The Harbor District has acquired five separate parcels of land near the harbor as shown on drawing no. 3360-108, as well as 1,235 acres of tidelands and submerged lands shown on the same drawing.

The area of tidelands and submerged lands extends bayward from the 1959 Ordinary High Water Mark and is bounded on the west by a line bearing S 26° E from Pillar Point and on the south by a line bearing N 57° E toward the Miramar Hotel. The title to this land has been granted by the State of California to the Harbor District by an act passed in the 1960 session of the California Legislature. This grant is contingent upon the Harbor District complying with the express conditions of the act regarding the purposes for which the land is to be used and the manner in which it is used. Briefly, these conditions are as follows:

(1) That the lands be used only for the establishment, improvement and conduct of a harbor for public, commercial, navigational and recreational uses;

(2) That the lands be improved by the District within 10 years of the effective date of the act;

(3) That the State of California retain mineral rights and be permitted the use of the improvements without charge;

(4) That there be no discrimination in the operation of the harbor and its improvements;

(5) That the people have the absolute right to fish in the waters of the harbor with the right of navigation and of convenient access over the lands granted;

(6) That the State may use the lands or any portion thereof for highway purposes without compensation to the District, except that there will be compensation for any improvements on the property taken.

Parcel A of the land owned by the District provides access to the West Breakwater and Parcel C provides access to the East Breakwater. These accesses to the breakwater were required by the Federal Government for construction and future maintenance of the breakwater. Parcel C would be excellent for developing facilities for beach bathing and picnicking. Parcel B is the land on and offshore from which the harbor improvements financed by the District will be developed.

SECTION III. MASTER SITE PLAN FOR THE PILLAR POINT HARBOR PROJECT

A. Proposed Facilities. -

1. Land to be used. -

The land to be used for the Pillar Point Harbor Project includes Parcel B as shown on drawing no. 3360-108, including the recently acquired Ortisi and Daniele property, and the tideland and submerged land between this property and the newly established pierhead line. The side boundaries would extend from the corners of Parcel B in a direction approximately perpendicular to the shore line.

The Parcel B property is located to the east of the center of the harbor. It is bounded on the east by the Cabrillo Highway, on the west by the sea cliff and there are deep drainage gullies near each side of the area. The land near its midpoint is at an elevation of about 40 ft. near the highway and about 36 ft. at the top of the sea cliff. At this point, the sea cliff rises 28 ft. above the beach.

2. General description. -

The Master Site Plan for the complete development of the project is shown in its relationship with the vicinity and harbor on drawings nos. 3360-101 and 3360-102 and in more detail on drawing no. 3360-103. It is proposed to provide a bulkhead wall behind which fill would be placed to develop space for shore facilities; a public wharf which would have accommodations for commercial fish handling and small craft fueling and would provide access to boat berths; individual berthing slips for commercial and sport fishing boats and pleasure boats; parking space for automobiles and automobiles with trailers; a harbormaster's building; a marine chandlery and general store; a yacht club building; comfort stations; a small shop and warehouse building for the harbor maintenance crew; a boat launching ramp; boat hoists; and dry storage areas.

3. Incremental construction. -

Accomplishment of the complete installation will require more money than is presently available; consequently, the project has been divided into four increments for construction, as shown on drawings nos. 3360-104, 3360-105, 3360-106 and 3360-107. Beyond the construction of the first increment required as a minimum to fulfill the obligation to the Federal and State Governments, the remaining increments can be adjusted to suit the demands and the availability of funds.

Increment I would consist of an L-shaped public wharf with facilities for fueling boats and handling commercial fish. A portion of the bulkhead would be constructed and fill placed behind it for a parking area. There would also be an access road off County Road, a harbormaster's building, a temporary warehouse and comfort stations.

Increment II would complete the bulkhead and fill and grading onshore and develop parking areas and the launching area. The general store and additional comfort stations would be added. Offshore, berths would be constructed for 62 pleasure boats, 12 sportfishing boats and 17 commercial fishing boats.

Increment III would increase the number of boat slips. The total berths would then be as follows: pleasure boats, 93; sportfishing boats, 26 and commercial boats, 37.

Increment IV would complete the project by adding more parking area and a yacht club onshore as well as a new berthing area consisting of header, landing and finger floats. There would then be facilities for 234 pleasure boats, 26 sportfishing boats and 37 commercial fishing boats.

B. Summary of Cost Estimates:

Cost estimates of the four phases of construction and of the total project are included as Appendix A and are summarized as follows:

Increment I	$ 523,800
Increment II	855,800
Increment III	57,400
Increment IV	292,300
Total Cost of Project	$1,729,300

If the public wharf is constructed of a concrete deck on concrete piles, an additional $100,000 should be added to Increment I.

C. Offshore Design Features. -

1. Public wharf. - The public wharf would extend from the bulkhead line to the pierhead line, a distance of 580 ft. The width of the pier would be 28 ft. to permit two-way automobile traffic plus temporary parking space. The ends of the wharf would be widened to permit automobile parking and turnaround. Facilities for handling commercial fish would be located at one end of the wharf and would include a small building and an unloading crane.

A treated timber deck on treated timber piles would be the most economical construction for the wharf, providing that timber piles can be driven at this site. This type of wharf has the disadvantages that it can be destroyed by fire and does not have as long a useful life as other types of construction. If funds will permit, we recommend the construction of a fire-proof wharf which would not only eliminate the fire hazard but also result in lower maintenance, repair and replacement costs in the future. The exact type of construction would be dependent upon the bottom conditions encountered at the wharf site.

2. Boat mooring facilities. -

The plan of the boat berths would be as shown on drawing no. 3360-103. The numbers and sizes of boats which could be accommodated are given in the following table:

TABLE 1

SUMMARY OF BOAT BERTHS

Construction Phase	Commercial 70'	Sport-Fishing 50'	25'	30'	35'	40'	45'	50'	80'	Total
I	(17*)									
II	17	12	35		14	13				91
III	20	14			16	15				65
IV				18	30	26	24	24	19	141
TOTAL	37	26	35	18	60	54	24	24	19	297

* Dredged area. For anchorage only, no berths.

In addition to the 297 berths, there would be space for transient boats near the launching area and at the loading areas. The finger piers for the individual boats would be about 3 ft. wide for the 25 ft. berths and 4 ft. wide for the remainder. The headers to the berths would be approximately 9 ft. wide to permit two-way traffic of boat users with small carts for gears and supplies. The berths off the public wharf would have 30 ft. gangways. The main header serving the eastern anchorage would be 16 ft. wide at the launching area and 12 ft. wide from there to the end.

The basis for the number of berths shown in the report "Design Memorandum No. 2, General Design for Half Moon Bay, California", prepared by the District Engineer, San Francisco District, Corps of Engineers and dated April 1957. The survey on which the report is based estimated

that there was a need for berths for 300 craft and facilities for 100 transient outboards. The trend toward boat ownership has probably increased at a greater rate than was assumed at the time of this report and it would appear that the demand for berthing space would eventually exceed the capacity of this project. There is, however, adequate space in the harbor for the future development of additional anchorages either by the District or by private investment.

The berthing for commercial and sportfishing boats is near the fish unloading facilities of the public wharf and is separated from the pleasure boat berthing. The facilities for commercial fishing boats would consist of a headwalk and piling spaced to tie off the bow lines of the boats. This method of anchorage is recommended because it would minimize the berthing costs to the fishermen, and would permit the boats to be tied abreast with access from the stern. The sportfishing berths would permit two boats to be tied up at each slip with the possibility of adding a finger between if this should become desirable.

The pleasure boat berthing has been planned to accommodate the smaller boats initially and to install the larger berths as the project is expanded. The general trend among boat owners as they develop interest in boating is toward larger boats so that, as a marina such as this develops, the demand for larger berths increases. This potential demand can be taken care of by constructing the slips with the widths shown, so that boats longer than the slips could be accommodated.

3. Float construction. -

With the tidal range encountered at Half Moon Bay, it will be necessary to provide floating mooring facilities with timber piles for guides.

Numerous types of pontoons are available for the slip, header and loading floats. These include steel, styrofoam, styrofoam coated with fibre glass or plastic, fibre-glass-reinforced plastic coated plywood boxes, molded fibre-glass-reinforced plastic and lightweight concrete units. The three types of floatation units which have been used the most are styrofoam logs, molded fibre-glass-reinforced plastic pontoons and lightweight concrete pontoons. Styrofoam floats are cheaper than either fibre glass or concrete which are competitive with each other. While styrofoam is not subject to loss of buoyancy by puncturing, it is not as durable and, depending upon the design, may not be as stable as either fibre glass or concrete. It is also subject to attack by petroleum products and marine borers.

The use of either lightweight concrete pontoons, provided they are available, or fibre-glass-reinforced plastic pontoons are recommended for the construction of the floats. Properly constructed lightweight

concrete pontoons are being used successfully in Southern California; however, they require the use of experienced manufacturing techniques to insure permanent watertightness and, at present, they are not manufactured in Northern California.

Molded fibre-glass-reinforced plastic pontoons are strong, durable, light and extremely resistant to deterioration. The deck for these pontoons would be constructed of salt-treated timber securely connected with zinc-coated bolts, spikes and plates. A freeboard of about 15 inches without live load should be provided. Concrete and fibre-glass-reinforced plastics are being considered for decking, and it is possible that by the time the floats are to be built, they will be sufficiently developed and competitive in price to be considered.

Neoprene rubbing strips and bumpers, hardwood cleats and storage lockers would be provided for the boat slips.

4. Channels. -

The main channel would be 100 ft. wide to permit safe passage between the pierhead and bulkhead lines. Whether or not channels on each side of the project should be provided is dependent on the Commission's plans for developing the adjacent submerged lands. The plans shown would allow 40 foot clearance to the proposed north and south boundaries of the project. This assumes that, if piers or berths were developed next to the project, a corresponding width would be allowed so that an 80-foot wide channel would be provided between this and adjacent projects.

5. Fueling float. -

The fueling float would be of reinforced concrete or gunite construction and approximately 15 ft. by 60 ft. in plan dimension. The float would have facilities for dispensing two types of gasoline and one type of diesel fuel and packaged lubricating oil, and would be equipped with meters and hoses with nozzles. Storage tanks would be underground on shore and would be filled by tank truck delivery. Pumps would be located near the tanks with submerged suction and remote stop-start control on the fueling float. Fuel lines would connect the tanks to the dispensing point via the public wharf. Of the several ways of providing the fueling systems, a usual and satisfactory one would be an arrangement with an oil company whereby the company would design and install the system and sell it to the owner, who would make installment payments over a period of 3 or 4 years. Under this arrangement, the oil company would retain exclusive rights for a period of about 10 years to furnish the petroleum products.

6. Launching area. -

The launching area would be located in the northeastern corner of the project. The main feature would be the 90-foot wide ramp which would, under supervision, permit the handling of at least six boats at a time. The ramp would consist of a concrete slab on a 10% slope and would have rock slope protection on each side to prevent scouring. A 2-ton crane-type boat hoist, located on the bulkhead, is recommended over an overhead monorail-type hoist because it can handle sailboats as well as outboards. The float landings in this area would facilitate the loading and unloading at the ramp and with the crane. The near side of adjacent header floats would be left free of fingers to provide additional landing space and temporary mooring for transients.

7. Protective features. -

Being located to the side of the opening in the breakwater, the project is not in direct line with the path of waves entering the harbor. The Corps of Engineers' report estimated that the largest waves which will be refracted into the deepest part of the project will have a height of less than 2 feet. The public wharf and the anchorage for the large commercial boats would be located in the area of the most wave action and would afford further protection to the smaller boats.

8. Dredging required. -

The water would have a dredged depth of 7 feet at the bulkhead and 10 feet over most of mooring area. A dredged depth of 12 ft. would be provided from face of the wharf back through to area established for commercial fishing boats. The first increment of construction would include the dredging for the commercial boats and a channel along the public wharf. The latter would permit easier construction of the wharf causeway, eliminate the need to dredge extensively around a structure in the future, and at the same time would provide water depth for pier fishing.

Seven feet of dredging will be required at the bulkhead line since it approximately follows the mean lower low water contour. The 12 foot water depth contour crosses through the pierhead line and, consequently, there would be very little dredging at the offshore side of the project. On the basis of the soils information given in the Corps of Engineers' report, it is probable that the material to be dredged is sand although this will have to be further investigated. The construction of the breakwater to the south of the project has caused the deposition of sand on the north side of the breakwater and may have affected the project area, in which case more dredging than has been described would be required.

D. Onshore Design Features. -

1. Bulkhead. -

The investigations of the Corps of Engineers indicate that the beach along which the bulkhead would be constructed has a sand overburden 20 ft. or more in depth on a formation of well compacted, slightly indurated sandy to clayey sediments, and it would, therefore, seem that the bulkhead would best be constructed of precast concrete sheet piles driven or jetted into place. This type wall would be more expensive than either timber or protected steel sheet pile construction, but should have a longer life with less maintenance than either and would be superior in appearance to either. The top of the wall would be at elevation 12 above mean lower low water (MLLW) and the dredged depth in front would be 7 ft. below MLLW. The wall would have a concrete cap and steel tie rods anchored to concrete deadmen. If it should happen that rock is encountered at shallow depths, steel sheet piles would then be substituted for the concrete piles.

Earth material suitable for filling behind the bulkhead would be available either from grading the cliff area or from the dredging operation. Considering both sources, there would be more material suitable for fill than is needed, and further study would be required to determine the most economical means of disposing of the excess. It would probably be advantageous to minimize the amount of grading in the first increment of this project and to use dredged material for fill behind the bulkhead.

2. Grading of the land. -

The Parcel B property would be graded to eliminate the sea cliff and the drainage gullies, of which there are two, one at each end of the property. Starting at the highway which is at about elevation 40, the land would be graded to elevation 12.0 at the bulkhead, using terraces to develop suitable parking areas. Drainage from the two gullies would discharge into the harbor through culverts.

3. Access roads. -

The main point of access to the area would be from County Road which runs by the property at the north end and intersects with the Cabrillo Highway. Another entrance would be provided off Cabrillo Highway at the south end. In the event the State Division of Highways reconstructs the highway as a freeway, which it is authorized to do if the need arises, this latter access would be eliminated unless it could be connected to a frontage road.

4. Parking areas. -

Space for parking automobiles and automobiles with attached trailers would be provided in the graded area between the highway and the bulkhead, as indicated in Table II.

TABLE II

PARKING SPACE

	Increment I	II	III	IV	Total
Automobile	(78*)	299	--	98	397
Automobile with Trailer		165	--	--	165

* Temporary parking area

There would be one and one-third times as many parking spaces as boat berths; this ratio is lower than what is normally provided in a modern marina; however, there is additional undeveloped property nearby for future expansion.

The automobile and trailer area would, of necessity, be a short distance from the launching area, but with adequate space for maneuvering boat trailers and unloading supplies near the launching area, the arrangement shown should prove satisfactory. However, it probably would be advisable to make hand carts available for transporting supplies and gear to the boats. Hand carts should also be available for the people whose boats are berthed at the marina.

5. Chandlery and General Store. -

A chandlery and general store would be constructed near the County Road entrance to the parking area. Located near the road, it would also attract customers passing by. The store would normally be operated privately as a concession.

6. Harbormaster's Building. -

The harbormaster's building would be located adjacent to the public wharf at the shore end. This would situate the harbormaster in a central location enabling him to maintain control of the marina. Most of his business would be transacted with people calling by land; however, a

landing would be located nearby to accommodate visiting boats seeking transient mooring facilities.

7. Yacht club building. -

A yacht club building, centrally located on the edge of the bulkhead, would be constructed to provide dining, entertainment and meeting facilities for the boat owners and visitors. While this building would provide the necessary facilities for a private yacht club, it also should having dining and refreshment facilities open to the general public. It would be advisable to include some space in this building for the use of the Harbor Commission in carrying out its administrative duties. As an alternative, this could be provided for in the harbormaster's building.

8. Miscellaneous facilities. -

Comfort stations would be located on the public wharf and at the foot of each berthing area. At least one of these would include showers and lockers to accommodate visiting and local boatmen staying with their boats overnight.

A small maintenance shop and yard would be provided near the dry storage area for the storage of harbor maintenance equipment and supplies and for a workshop area. For the first increment, a temporary shop would be located near the harbormaster's building.

A small building would be located in the launching area for the hoist and ramp operators. Two areas would be fenced off to provide dry storage of boats, trailers and gear. Shed-type covered areas could also be included if the need for them should arise.

E. Utilities. -

The project would be provided with water, electrical, telephone and sewage services connected to the local utilities and would also have its own fire protection and fueling systems.

Fresh water service would be provided for the boats by means of one hose bibb and hose reel for each two boats. The locations would be such as to avoid having hoses crossing the header float. Plastic pipe would be used on the floats because of its corrosion-resistance and flexibility; however, galvanized steel pipe would be used for the hose risers. The fresh water would also be used for fire protection onshore.

An auxiliary salt water fire protection would be provided on the public wharf and would include an electrical pump with a standby engine for emergency power and fire hydrants. As additional fire protection, portable fire extinguishers would be located at each end of the header floats.

Electrical service would include floodlighting onshore and on the public wharf and overhead lighting on the header floats. Duplex convenience outlets would be placed on the header floats to provide one 120 volt power outlet for each berth. Plastic conduit would be provided on the floats, except for the risers, because of the corrosion problem.

Sewage would be collected from laterals to the various facilities by a main sewer line behind the bulkhead. The main would connect near County Road to a lift station which would pump into the Granada Sewer District sewage system. Because of the distance to shore, a sewage ejector would be required on the end of the public wharf to serve the rest rooms there.

Telephone booths would be located on the public wharf and at various points onshore. The berthing facilities would be served by booths located approximately 200 ft. apart.

The fueling system, which has been discussed hereinbefore, would include underground storage tanks and pipelines, pumps, and three fuel pipelines on the public wharf to serve the fueling float.

F. Relationship to the County Master Plan. -

The San Mateo County Planning Commission is in the process of preparing a Master Plan for the Half Moon Bay Airport Vicinity and a copy of this preliminary plan is included as Plate 1. The Pillar Point Harbor Project as presented in this report has been considered in the Planning Commission's Master Plan and the Project Area has been shown for commercial-recreational use. The eastern end of the harbor, where the Harbor District's Parcel C is located is shown for recreational use, and the western portion of the harbor, which includes the District's Parcel A, has been shown for industrial-commercial use.

SECTION IV. OTHER HARBOR FACILITIES

The Pillar Point Harbor Project would be only part of the total development of the harbor. Facilities for boat sales, rental and repair, restaurants, motels, fresh fish markets and such other enterprises as may be developed in an area such as this have not been included in the project for the reason that these would probably be provided by private investors using privately-owned lands fronting on the harbor; however, if necessary, the Harbor Commission could also provide for such additional needs of the boating public as may arise in the future.

The east end of the harbor would be well suited for use as a picnic and surf bathing area. Access to the beach, parking spaces, comfort stations and the like could be planned on District property designated as Parcels C, D and E.

Berthing will be required for the U. S. Coast Guard who intend to station Search and Rescue Patrol Vessels in the harbor. The harbor side of Pillar Point would be a good location for construction of a small wharf for the Coast Guard operations. This same area could also be further developed to include cargo handling facilities for such commercial products as lumber.

One of the reasons for Federal participation in the construction of the harbor was the need for a harbor of refuge on this section of the California coast. Consequently, suitable space should be reserved for the temporary mooring of both pleasure and commercial craft forced to seek refuge. The area near Pillar Point and inside the harbor would serve such a purpose.

The necessary aids to navigation for the harbor and its entrance will be installed, operated, and maintained by the U. S. Coast Guard; so that nothing is required of the District in this regard other than the proper lighting of its own facilities.

SECTION V. DEVELOPMENT AND OPERATION OF THE PROJECT

A. Development of the Project. -

The steps necessary to continue the development of the project to its completion are as follows:

1. Make topographic and hydrographic surveys and plot maps of the site, which work is now being done.

2. Prepare preliminary designs of the project and estimates of cost.

3. Make a soils investigation and analysis, and if necessary have test piles driven at the site.

4. On the basis of the preliminary designs and cost estimates and the amount of money available for construction, determine the scope of the first increment of the project, and prepare the final plans, specifications and contract documents for it.

5. Obtain a permit from the Corps of Engineers for the construction work.

6. Invite contractors to bid for the contract for construction of the first increment.

7. Select the contractor and award the construction contract.

8. Inspect and supervise the construction work.

9. Repeat steps 4 through 7 for the remaining increments of construction.

It would take four months to develop the preliminary designs and prepare final plans, specifications and contract documents for the first increment. The preparation of the plans, specifications and contract documents of the remaining increments would take from 2 to 4 months for each increment. About six weeks would be needed for advertising for bids, bidding time and awarding the contract for each increment. The construction time required for the first and second increments would be about six months each, and for the third and fourth increments, four to five months each.

B. Operation of the Project. -

Prior to completion of the construction work, it will be necessary to hire a harbormaster and such other personnel as may be needed and to establish rules and procedures for the operation of the project. These operational procedures need not be extensive at first, since the facilities provided in the first increment are limited, and can be expanded as the project is developed.

C. Operation of the Harbor. -

The Harbor District, as owner of the tidelands and submerged lands, has control over the development of the entire harbor. Consequently, rules and procedures should also be prepared relative to the leasing and use of this land. To accomplish this, it would seem advisable to extend the master plan to include the entire harbor so that future construction will be in keeping with the general interests of persons using the harbor and so that owners of property fronting on the harbor will have equal opportunities insofar as possible to develop their lands.