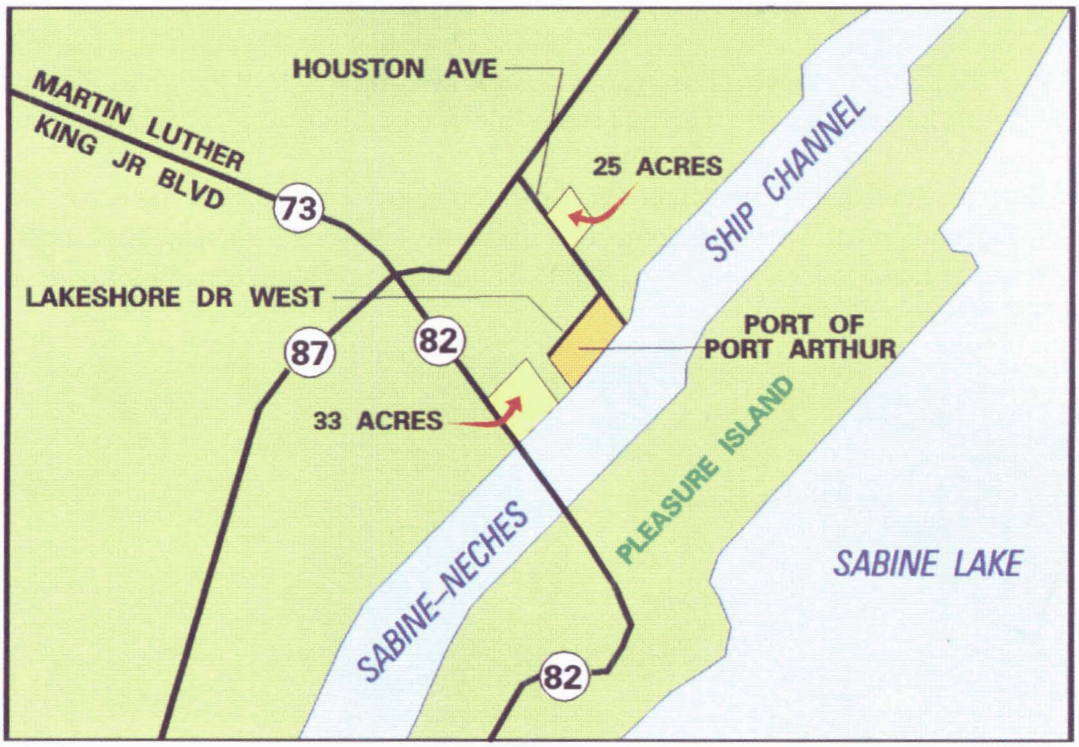


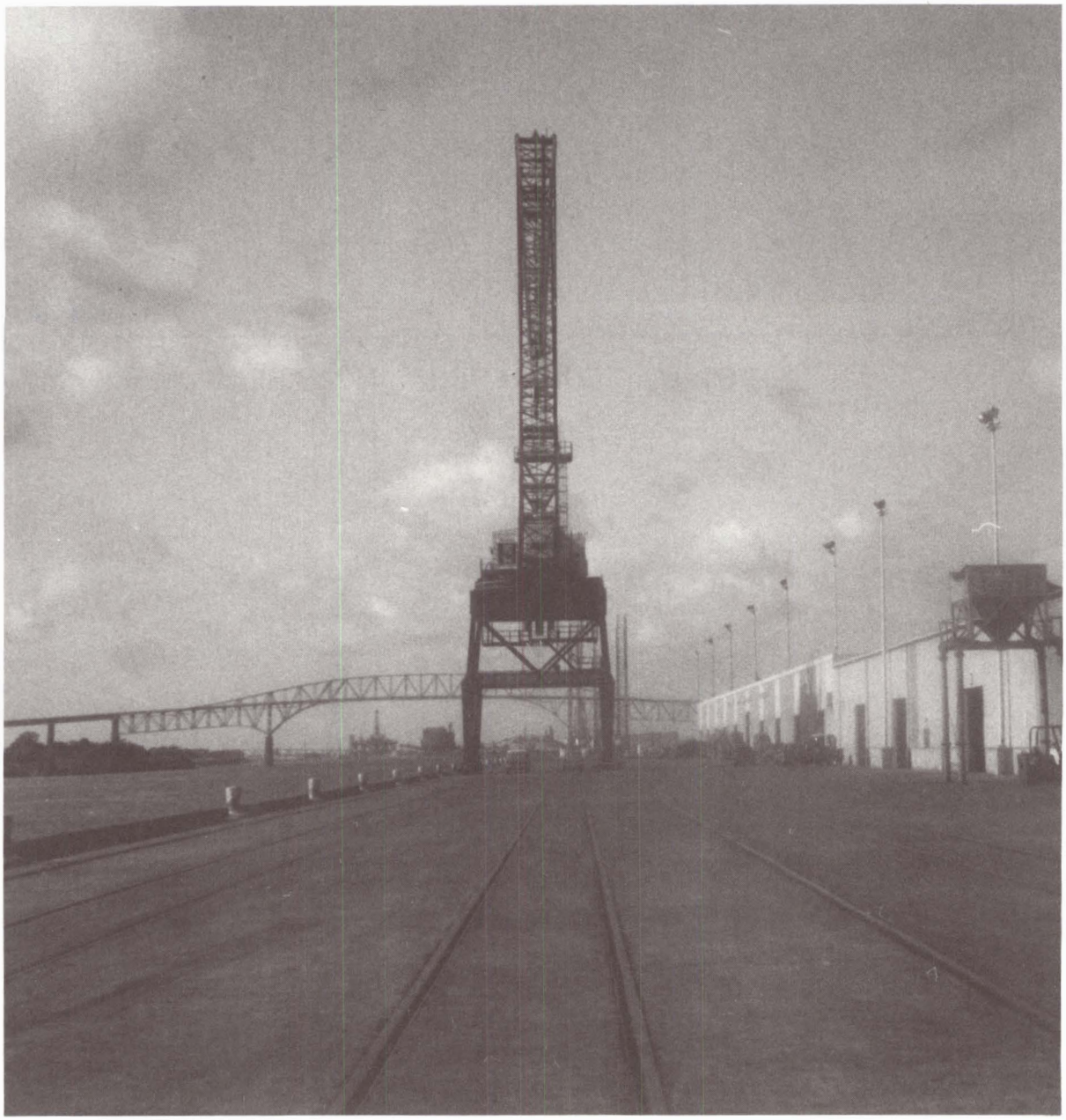
Port of Port Arthur Designated Marshaling Areas

Marshaling Area Southwest of Port

MATERIALS HANDLING EQUIPMENT (MHE)

"Big Arthur," the port's 75-ton revolving gantry crane, travels the length of the wharf. Three railroad tracks also run the length of the wharf and are accessible by the crane for direct loading and unloading.

The port does not own any MHE except for the 75-ton gantry crane. Local stevedore companies furnish all other equipment. Stevedore companies frequently use 50- to 75-ton mobile cranes. Mobile cranes with capacities up to 300 tons are available. Stevedore companies can also provide container handling equipment.



"Big Arthur" at Berths 1 and 2

INTERMODAL FACILITIES

Although the Port of Port Arthur has a container handling capability, it does not have a dedicated intermodal railyard. The nearest intermodal railyards are in Houston. The PND report of the Port of Houston provides information on these facilities.

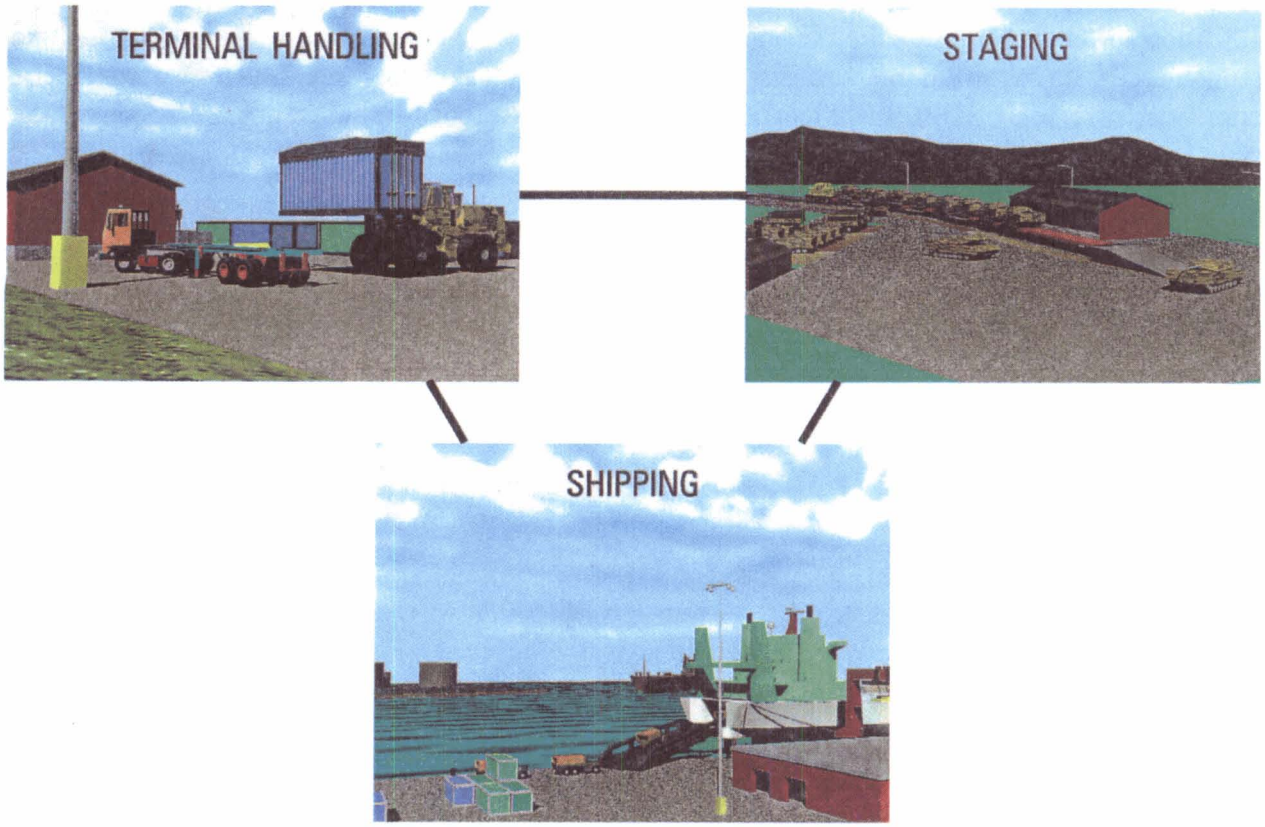
FUTURE DEVELOPMENT

The Port Authority of the Port of Port Arthur recently purchased 33 acres of cleared waterfront land directly southwest of berth 1. This area is the first marshaling area described in the marshaling area section. The plans are to develop this land into another 2,125 feet of wharf. This wharf will have a 100-foot apron and transit shed, similar to berths 1 and 2. When complete, the berths will be renumbered with berth 1 at the northeast end, and berth 5 at the southwest end. The current 75-ton crane will traverse the entire 3,325 feet of wharf. The Port Authority may install another crane if the need arises.

II. THROUGHPUT ANALYSIS

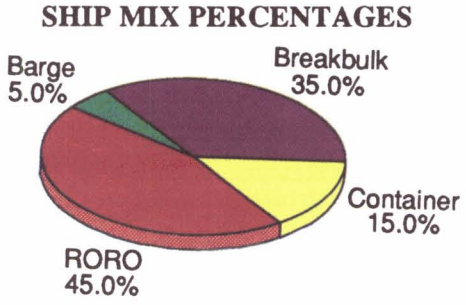
GENERAL

This section evaluates the theoretical throughput capability of the Port of Port Arthur using the port operational performance simulator (POPS) computer model. The model is based on a weak-link analysis in which each subsystem is analyzed separately and then compared to find the least capable subsystem. The weakest subsystem defines the maximum throughput capability of the terminal. The model yields throughput capability values for three subsystems - shipping, staging, and terminal processing/handling - in short tons (STON) and measurement tons (MTON) per day.



Terminal Throughput Subsystems

The analysis assumed that 80 percent of the port facilities will support the military deployment. Also, the ship mix is based on Desert Shield and Desert Storm statistics. We weighted the percentages to adjust for differences in cargo dead-weights and expectations for future deployments.



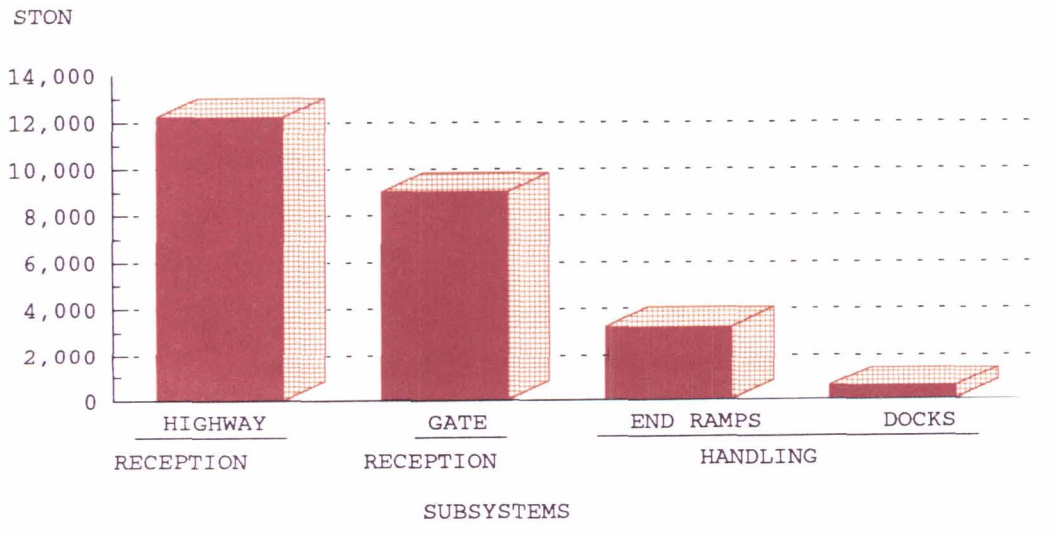
TERMINAL RECEPTION/HANDLING

HIGHWAY

The main routes to the port are via US Routes 69, 96, and 287 (from northwest) and Texas Routes 87 (from north or south), 73 (from west), and 82 (from east). The port has one main gate that allows access to the unloading and staging areas. The roadway in and out of the port, including the gate processing of vehicles, could handle more than 9,000 STON of equipment and supplies per day.

Roadable vehicles in convoys will process directly to the staging area. Vehicles on commercial or military flatbed trailers not equipped with a means for unloading vehicles can offload at any of the truck docks by the transit shed. Supplies in van semitrailers can also offload at the truck docks. Using 55 of the available truck docks (with the other 50 truck docks serving as rail docks), these docks could offload nearly 3,800 STON (combined truck end-ramp and van handling capability) per day. Although the Port of Port Arthur is not specifically designed to handle containers, it has a limited container transfer capability.

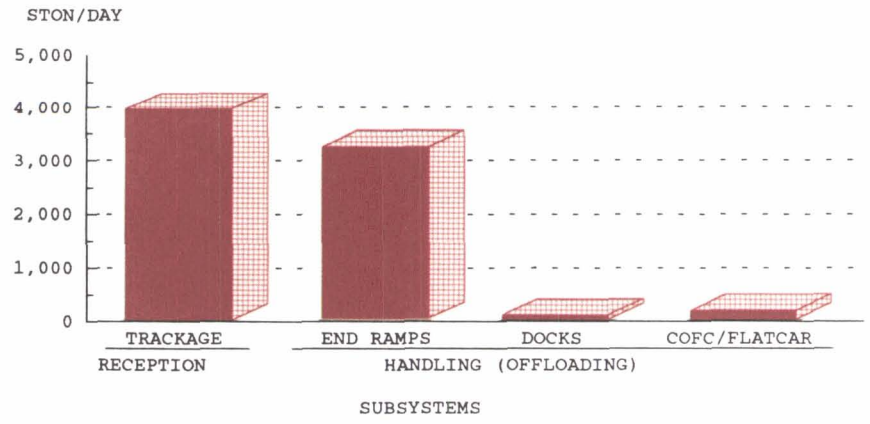
HIGHWAY RECEPTION/HANDLING CAPABILITY



RAIL

The Port of Port Arthur has three railroad tracks running along the wharf. These tracks allow direct transfer of cargo from railcar to ship. The port also has two tracks running along the inland side of the transit shed, which allow offloading of boxcars. The terminal office orders KCS to switch the tracks as necessary. The port has no permanent end ramps for circus-style loading. However, local stevedore companies can provide portable end ramps for offloading operations. A good location for these portable end ramps is the southwest end of the 140-railcar storage yard. Two rail spurs could be used to offload 60-foot railcars onto the cleared land downstream of the port (first marshaling area stated in the marshaling area paragraphs of section I). Each spur would support unloading about 14 railcars. This study uses a conservative assumption that the local stevedore companies will be able to provide only one end ramp.

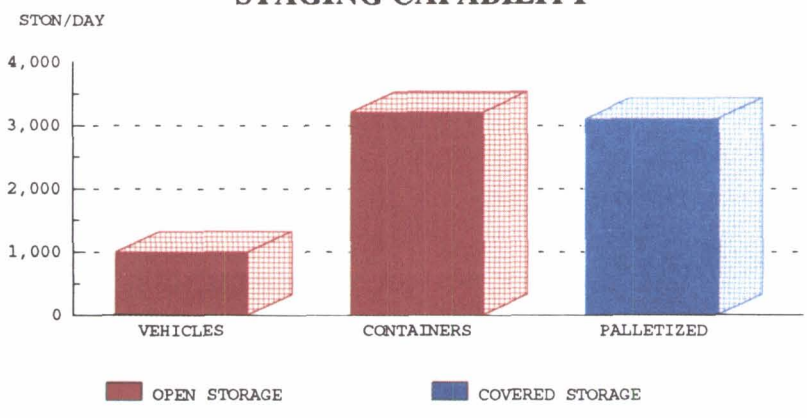
RAIL RECEPTION/HANDLING CAPABILITY



STAGING

The port has about 3 acres of open storage for vehicles and/or containers. Its staging area can store about 2,400 STON of breakbulk cargo and 950 STON of rolling stock (3,350 STON total) and 3,200 STON of containers. The port also has about 194,400 square feet of covered storage providing protection for about 3,100 STON of palletized cargo.

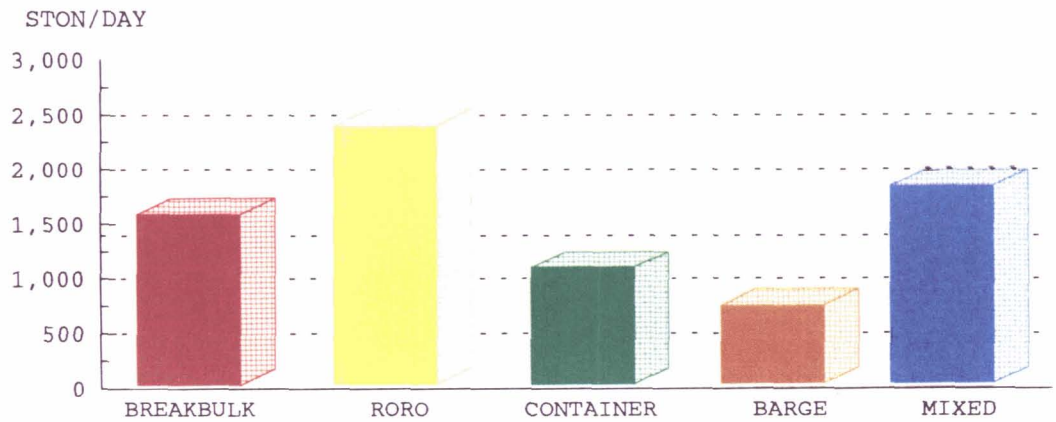
STAGING CAPABILITY



SHIPPING

The following chart shows the throughput capability per berth in STON per day for breakbulk, RORO, container, and mixed vessels. These results were based on various factors including MHE used, loading, operational, and berth usage rates, as well as berth/ship compatibility.

BERTH THROUPUT CAPABILITY



The berth/ship compatibility for various vessel types is shown in table 1. This table shows, for each type of ship, the number of vessels that berths 1 and 2 can accommodate. The table also provides the limitations that can hinder shipping operations.

TABLE 1

SUMMARY OF BERTHING CAPABILITIES OF PORT OF PORT ARTHUR

VESSEL	Berths 1-2
Breakbulk	
C3-S-33a	2
C3-S-37c	2
C3-S-37d	2
C3-S-38a	2
C4-S-1a	2
C4-S-1qb and 1u	2
C4-S-58a	2
C4-S-65a	2
C4-S-66a	2
C4-S-69b	1
Seatrain	
GA and PR-class	2
Barge	
LASH C8-S-81b	1
LASH C9-S-81d	1
LASH lighter	8
SEABEE C8--S-82a	1
SEABEE barge	6
RORO	
Comet	d,i,j
C7-S-95a/Maine-class	1
Ponce-class	h
Great Land-class	h
Cygnus/Pilot-class	1
Meteor	d,i,j
AmEagle/Condor	i,j
MV Ambassador	d
FSS-class	1,i,n
Cape D-class	i,j
Cape H-class	1,i
Container	
C6-S-1w	1,e
C7-S-68e	1,e
C8-S-85c	1,e
Combination	
C5-S-78a	1,e
C5-S-37e	1,e

a = maximum vessel draft limited to berth depth	h = no shore-based ranps available
b = inadequate apron width	i = insufficient ramp clearance at low tide
c = inadequate berth length	j = insufficient ramp clearance at high tide
d = no straight stern-ramp facilities	k = excessive ramp angle at low tide
e = no container-handling equipment	m = excessive ramp angle at high tide
f = inadequate berth depth, adequate anchorage depth	n = parallel ramp operation only
g = inadequate channel depth	o = insufficient apron width for side-ramp operation

Note: Ramp clearance and ramp angle based on maximum vessel draft.

III. APPLICATION

GENERAL

In this section, we evaluate the port's throughput capability for deploying a notional mechanized infantry brigade using mainly FSS vessels. The *MARAD Planning Orders Digest* does not call for use of the Port of Port Arthur facilities during national emergencies. Therefore, we assumed that the deploying unit will have access to 80 percent of the port for deployment. We also assumed that the deploying unit will be able to deploy using both berths at the Port of Port Arthur.

REQUIREMENTS

The likely requirement for the Port of Port Arthur is to deploy a notional mechanized infantry brigade in 6 days. The brigade has to move about 2,600 vehicles and 220 containers. The movement of this brigade to the port will require 360 (60 per day) railcars using a convoy/rail option. Under this option, about 1,220 (205 per day) roadable vehicles would be driven, and about 775 (130 per day) would be towed.

MECHANIZED INFANTRY BRIGADE
DEPLOYMENT DATA

Total Equipment

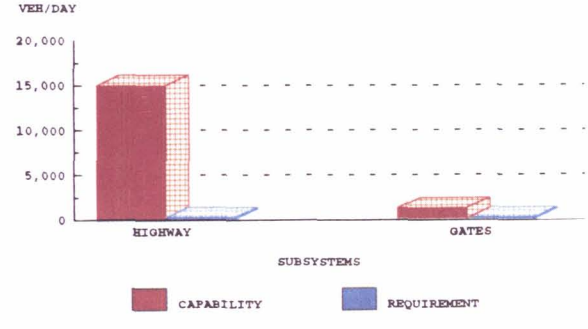
Volume	91,506 MTON
Weight	31,670 STON
Area	474,300 Sq Ft
Vehicles	2,600
Containers	220

TERMINAL HANDLING

HIGHWAY

Vehicles will access the Port of Port Arthur through the main gate from Lakeshore Drive West. Both the access road and gate can handle at least 1,200 vehicles per day.

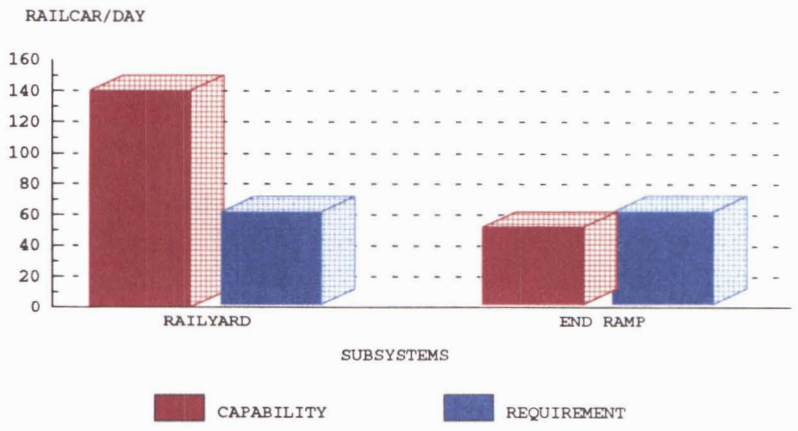
HIGHWAY INPROCESSING CAPABILITY



RAIL

The classification yard within the port could easily handle more than 140 railcars per day. However, the Port of Port Arthur does not have any rail end ramps. This study assumes that at least one end ramp will be available during deployment either through local stevedore companies or jury-rigging efforts of the deploying unit. If only one rail end ramp is available, the rail inprocessing/handling capability of the port may not meet the deployment requirement of the deploying unit. Our observation of the port shows that two rail spurs have potential for use during deployment. If local stevedore companies can supply 2 rail end ramps, then the capability to offload (100 railcars per day) will exceed the requirement.

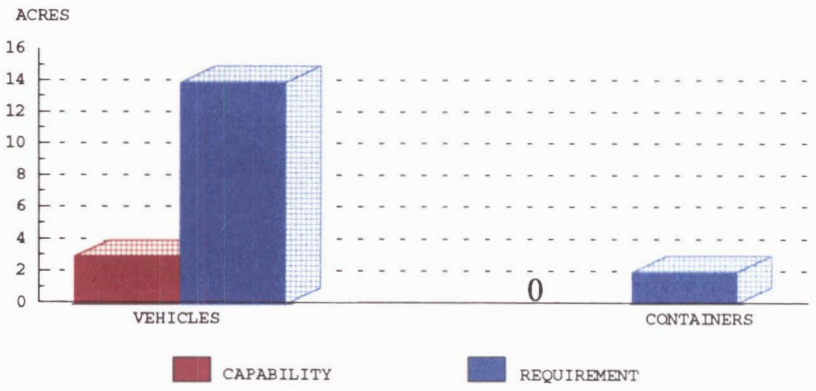
RAIL INPROCESSING/HANDLING CAPABILITY



STAGING

The port has about 3 acres of open storage area. We estimate that the Port of Port Arthur needs at least 16 acres (14 acres for vehicles and 2 acres for containers) of open staging to support the sustained loading of a one FSS vessel berth system.

OPEN STAGING CAPABILITY



SHIPPING

The number of ships needed to load this requirement depends on the shipping mix selected. The best ship mix would require three FSS vessels and one Cape H RORO ship. However, the turning basin is too small to accommodate an FSS vessel (see Section I, "General Data"). Also, the wharf length can accommodate only one vessel at a time. Based on 2 days to load a ship, a brigade cannot outload in 6 days on the required three FSS vessels and one RORO ship. Deploying units could outload using selected RORO and breakbulk vessels. However, a deploying mechanized brigade cannot likely outload within 6 days (see above table for number of breakbulk vessels needed to deploy a brigade).

UNIT MOVEMENT REQUIREMENTS
MECHANIZED BRIGADE

LOADING CONDITION/ SAMPLE SHIP MIX	*VESSEL TYPES*			
	FSS (RORO/COMB)	**CAPE H (RORO/COMB)**	**C3/C4 (BREAKBULK)**	**C6/C7/C8 (CONTAINER)**
Minimum Containerization				
All FSS*	2.67	0.64		
FSS and Cape H	2.22	1.00		
All Breakbulk			12.57	
Maximum Containerization				
FSS and Container	2.64			0.67
FSS, Cape H, and Container	1.54	1.00		0.67
Breakbulk and Container			9.86	0.67

*Only eight FSS are available. Unit shipping requirements exceed the capacity of these eight vessels. Other vessel types are required to make up the FSS shortfall (Cape H).

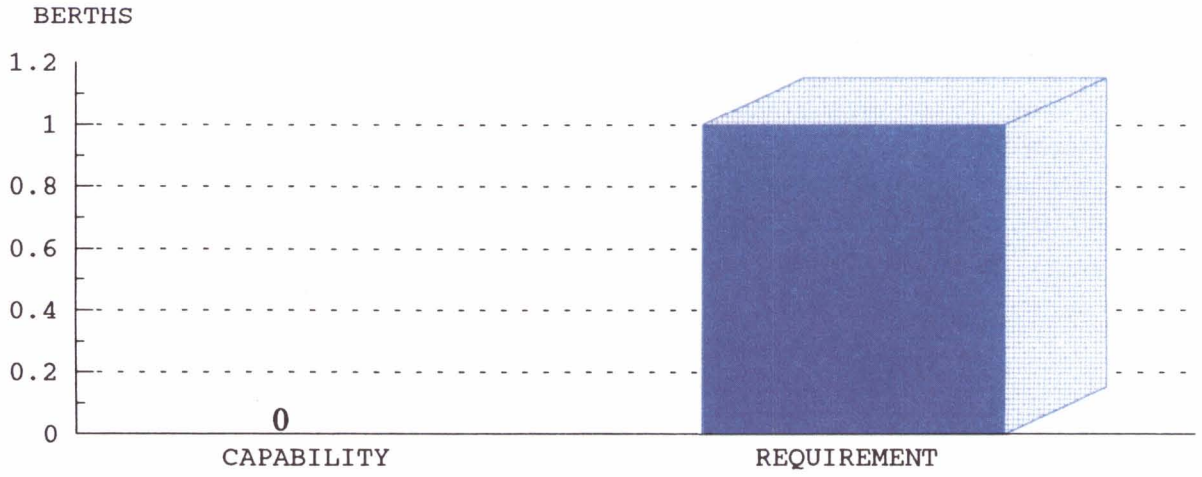
Legend:

RORO - roll on/roll off

FSS - fast sealift ship

Source: MTMCTEA Report OA 90-4f-22, Deployment Planning Guide, Aug 91.

FSS SHIPPING CAPABILITY



SUMMARY

The small turning basin north of the port limits the port to breakbulk and select RORO ships. Also, not enough berths are available to deploy a brigade in 6 days regardless of the type of ship used (FSS, RORO, or breakbulk) for deployment.

The Port of Port Arthur does not have enough staging area available to support deployment. The shipping subsystem is also a constraining factor in the throughput capability for the Port of Port Arthur.

The capability of the Port of Port Arthur to meet rail inprocessing/handling capability requirements depends on the ability to obtain two end ramps. End ramp use depends on availability from local stevedore companies or the fabrication ability of the deploying unit.

RECOMMENDATIONS

We do not recommend deploying a mechanized infantry brigade out of the Port of Port Arthur. However, deploying units could deploy portions of a brigade from the Port of Port Arthur using breakbulk or select RORO ships, if needed.

We recommend reevaluation of the Port of Port Arthur when the additional port facilities identified in the" Future Development" paragraph have been constructed and are ready for use.

APPENDIX

BERTH EVALUATION METHODOLOGY

GENERAL

This appendix provides a technique for accomplishing a comparative analysis of individual berths. The first step is to evaluate the individual berths within a port to determine their potential for breakbulk, RORO, container, and barge vessel operations.

INDIVIDUAL BERTH EVALUATION

For the individual berth evaluation, a comparison is made of the characteristics of each berth and the list of ideal factors required to support the different ship mixes. Tables 1 through 4 give the ideal factors for breakbulk, barge, RORO, and container ship mix operations. As the tables show, points are awarded for each factor. These are then used to compare the potential for each factor. These are then used to compare the potential of each berth to support the four ship mixes. A ranking of individual berths is established for each type of ship-mix operation, based on a comparison of the total points accumulated by each berth.

The berth receiving the highest accumulation of points is assigned a value of 1, and the remaining berths are ranked accordingly.

TABLE 1
IDEAL BREAKBULK BERTH FACTORS

BERTH FACTOR	POINTS	BERTH FACTOR	POINTS
Berth Type		*Transit Shed*	
Quay or marginal	10	Available 15	
Pier	7	None	0
Berth Length (ft)		*Deck Strength (lb per sq ft)*	
Greater than 750	20	Greater than 800	10
700 to 750	18	600 to 800	9
600 to 699	16	400 to 599	5
500 to 599	10	Less than 400	2
Less than 500			
Water Depth (ft) MLW		*Ship Service Facilities*	
Greater than 35.0	20	Power, water, and telephone	6
32.0 to 35.0	18	Power and water	5
30.0 to 31.9	16	Water only	4
28.0 to 29.9	14	None	0
Less than 28.0	12		
Apron Width (ft)		*Cranes*	
20.0 or greater	15	Wharf	10
Less than 20.0	5	Heavy-lift mobile (100 STON)	9
		Mobile	5
		None	0
Apron Tracks		*Conditional Age*	
2	10	New	10
1	7	10 years old	8
None	0	20 years old	4
		30 years or older	1

TABLE 2
IDEAL BARGE BERTH FACTORS

BERTH FACTOR	POINTS	BERTH FACTOR	POINTS
Berth Type		*Transit Shed*	
Quay or marginal	10	Available	10
Pier	7	None	5
Water Depth (ft) MLW		*Anchorages*	
Greater than 20.0	10	Protected	10
15.0 to 20.0	9	Partially protected	6
10.0 to 14.0	8	Unprotected	2
Less than 10	0	Unavailable	0
Apron Width (ft)		*Tug Availability of 650 hp or Greater*	
Greater than 60.0	10	More than 4	10
40.0 to 60.0	9	3 - 4	9
30.0 to 39.9	7	1 - 2	7
20.0 to 29.9	5	None	0
Less than 20.0	1		
Apron Tracks		*Barge Fleeting (No. of Barges)*	
2	10	40 or more	10
1	7	25	8
None	0	10	4
		None	0
Deck Strength (lb per sq ft)		*Conditional Age*	
Greater than 800	10	New	10
600 to 800	9	10 years old	8
400 to 599	5	20 years old	4
Less than 400	2	30 years or older	1
Cranes			
Wharf	10		
Heavy-lift mobile	9		
Mobile	7		
None	0		

TABLE 3
IDEAL RORO BERTH FACTORS

BERTH FACTOR	POINTS	BERTH FACTOR	POINTS
Berth Type		*Apron Tracks*	
Quay or marginal	10	2	10
Pier	5	1	7
		None	0
Berth Length (ft)		*Deck Strength (lb per sq ft)*	
Greater than 1,000	20	Greater than 800	10
900 to 1,000	18	600 to 800	9
800 to 899	16	400 to 599	5
700 to 799	10	Less than 400	2
600 to 699	6		
Less than 600	2		
Water Depth (ft) MLW		*Ship Service Facilities*	
Greater than 35.0	20	Power, water, and telephone	6
32.0 to 35.0	18	Power and water	5
30.0 to 31.9	16	Water only	4
28.0 to 29.9	14	None	0
Less than 28.0	12		
Apron Width (ft)		*Vehicle Access*	
Greater than 60.0	20	Uncongested	*10*
40.0 to 60.0	15	Congested	5
30.0 to 39.9	5		
Less than 30.0	0		
RORO Ramp Operations		*Conditional Age*	
Side, slewed, straight	10	New	10
Side, slewed stern	6	10 years old	8
Slewed stern	4	20 years old	4
Starboard, slewed stern	2	30 years or older	1
None	0		
Tidal Range (ft)			
0 to 3.9	10		
4.0 to 7.9	8		
8.0 to 11.9	6		
12.0 to 16.0	4		
Greater than 16.0	0		

TABLE 4
IDEAL CONTAINER BERTH FACTORS

BERTH FACTOR	POINTS	BERTH FACTOR	POINTS
Berth Type		*Deck Strength (lb per sq ft)*	
Quay or marginal	10	Greater than 1,000	10
Pier	5	800 to 999	8
		600 to 799	5
		400 to 599	3
		Less than 400	1
Berth Length (ft)		*Ship Service Facilities*	
Greater than 1,000	20	Power, water, and telephone	6
900 to 1,000	18	Power and water	5
800 to 899	16	Water only	4
700 to 799	10	None	0
600 to 699	6		
Less than 600			
Water Depth (ft) MLW		*Container Cranes*	
Greater than 40.0	20	Specialized container crane	20
35.0 to 40.0	18	Mobile gantry	16
32.0 to 34.9	16	Mobile crane (200-ton)	12
30.0 to 29.9	10	Mobile crane (100-ton)	8
Less than 28.0	6	None	0
Apron Width (ft)		*Container Handling Equipment*	
Greater than 60.0	10	Straddle cranes	10
40.0 to 60.0	9	Straddle trucks	9
30.0 to 39.9	5	Front/side-loading forklifts	8
20.0 to 29.9	2	Mobile cranes	5
Less than 20.0	1	None	0
Apron Tracks		*Conditional Age*	
2	10	New	10
1	7	10 years old	8
0	0	20 years old	4
		30 years or older	1
Consolidated Shed			
Available	10		
None	0		

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MILITARY TRAFFIC MANAGEMENT COMMAND
TRANSPORTATION ENGINEERING AGENCY

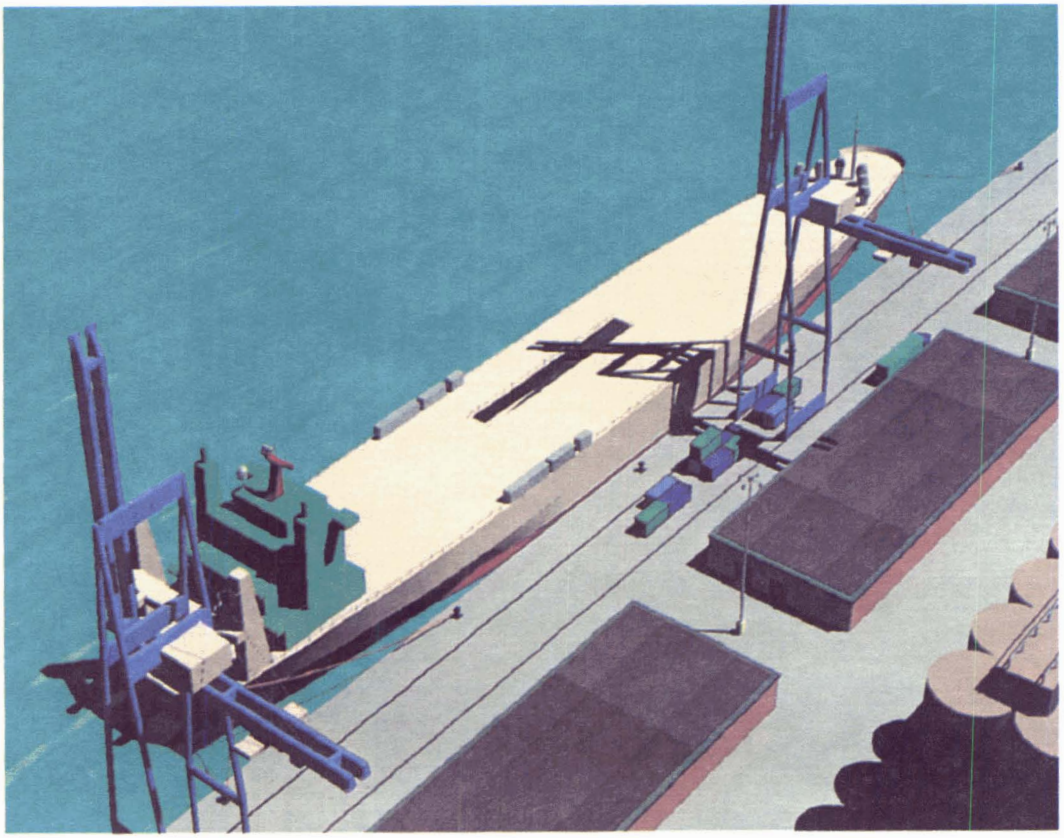
WEST COAST
PORTS FOR NATIONAL DEFENSE

PAUL BURGENER
A. GREY MARSH

SEPTEMBER 1994

CONTENTS

INTRODUCTION



As part of the ongoing Ports for National Defense (PND) Program, the Military Traffic Management Command Transportation Engineering Agency (MTMCTEA) revised information for selected west coast ports. The objectives of this report are to:

- *Identify* the port facilities and equipment needed to support a deployment.
- *Determine* the port throughput capability in MTON per day.
- *Determine* the ability of the MARAD designated facilities to meet the deployment of specific units.

PORT OF LONG BEACH
LONG BEACH, CALIFORNIA

I. GENERAL DATA

TRANSPORTATION ACCESS

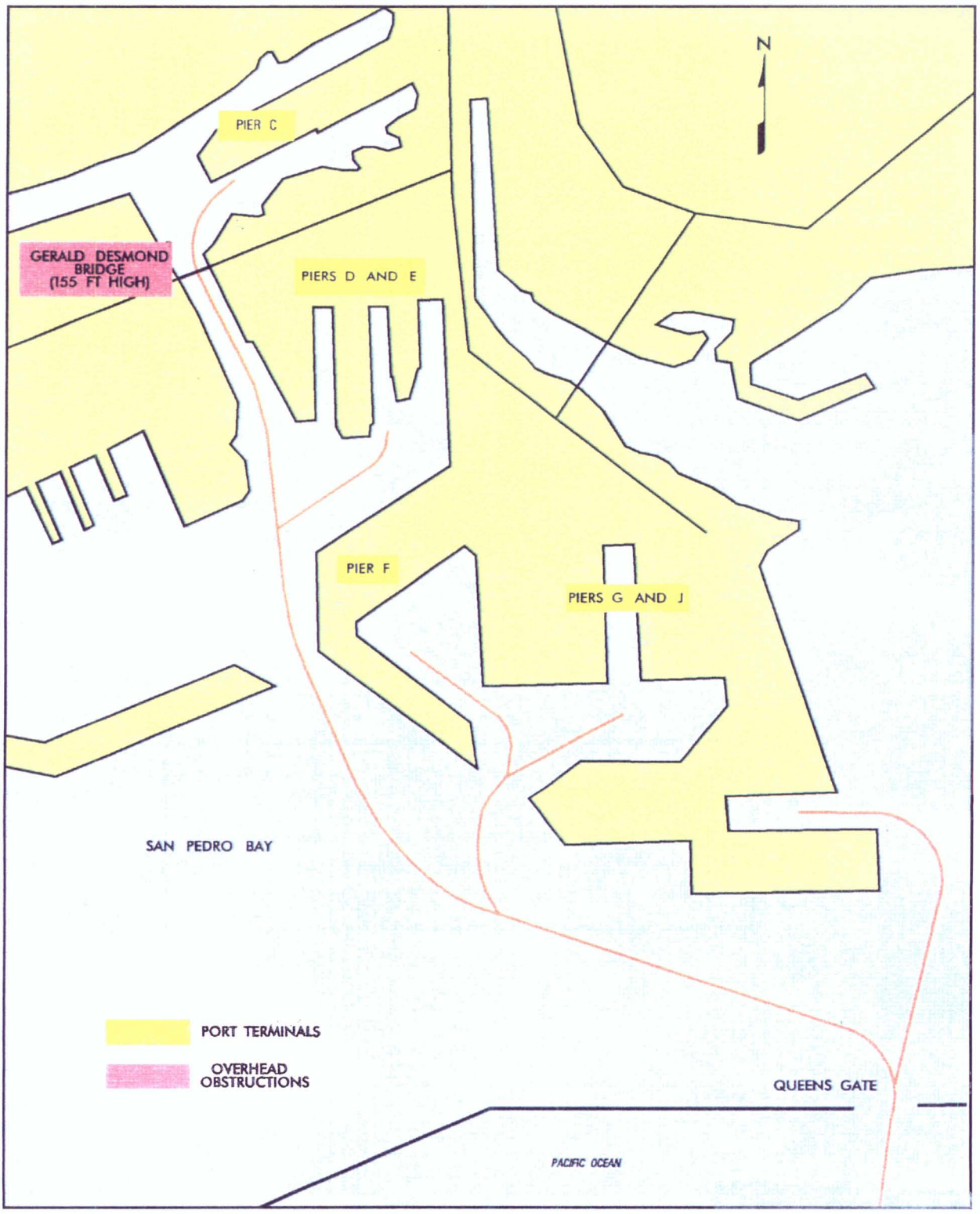
Water

All berths are less than 3 miles from open water. Entrance to the port is through a 12-mile-long breakwater that separates the San Pedro Bay from the Pacific Ocean. The channel provides access to all terminals, through the Queens Gate opening of the breakwater. After passing through the breakwater, ships traverse the San Pedro Bay. Channels are at least 45 feet deep at mean low water (MLW) and 400 feet wide. The main channel is currently 60 feet deep. Plans call for dredging the main channel to 76 feet, to accommodate supertankers.

Access to the Pier C Terminal is limited by the Gerald Desmond Bridge. This bridge restricts the usable width of the channel to 260 feet and the vertical clearance to 155 feet at mean high water (MHW).

The mean tidal range in Long Beach Harbor is 3.7 feet. A range of 9 feet may occur at maximum tide.

This report covers the sections of the port that are applicable to military operations. Passenger and bulk terminals are not included, because they are not easily adapted to support military operations. The terminals are on the water access map on the next page.

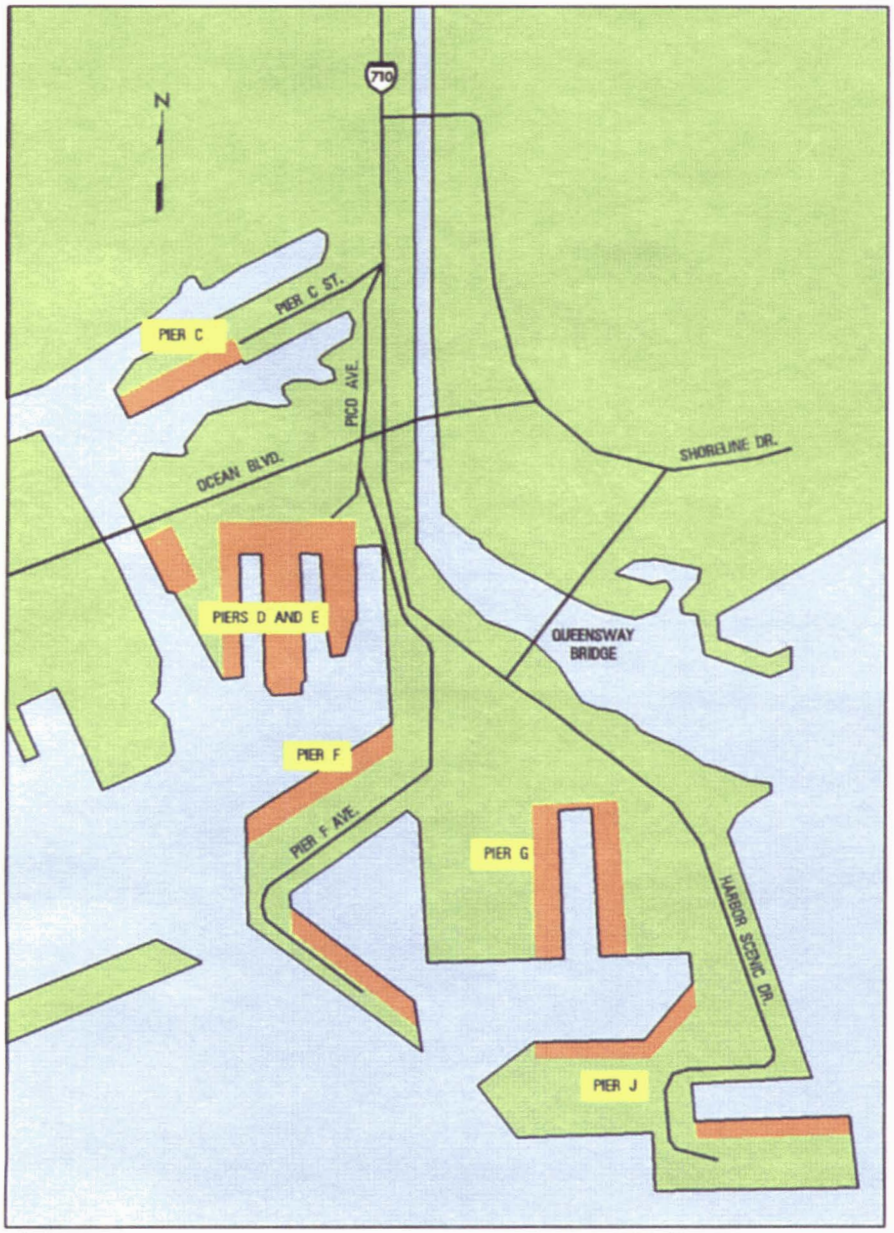


Water Access

Highway

Heavy traffic congestion usually prevails in the Long Beach metropolitan area. The Port of Long Beach has access to Interstate Route 710. Harbor Scenic Drive, Pico Avenue, and Piers C, E, F, and G Streets lead to the terminals.

Years of additions and modifications to port land and thoroughfares have left the port with discontinuous and confusing street names. The Port of Long Beach recently renamed the piers and streets to make it easier for motorists to locate port facilities. To simplify finding berths, the new pier letter precedes the berth number. Aside from the addition of the new pier letter, berth numbers have not changed. This report uses these new names for streets, piers, and berths.



Highway Access

Gate to International Transportation Service (Berths J232-J234)

Gate to Long Beach Container Terminal (Berths F8-F10)

Gate to California United Terminal (Piers D and E)

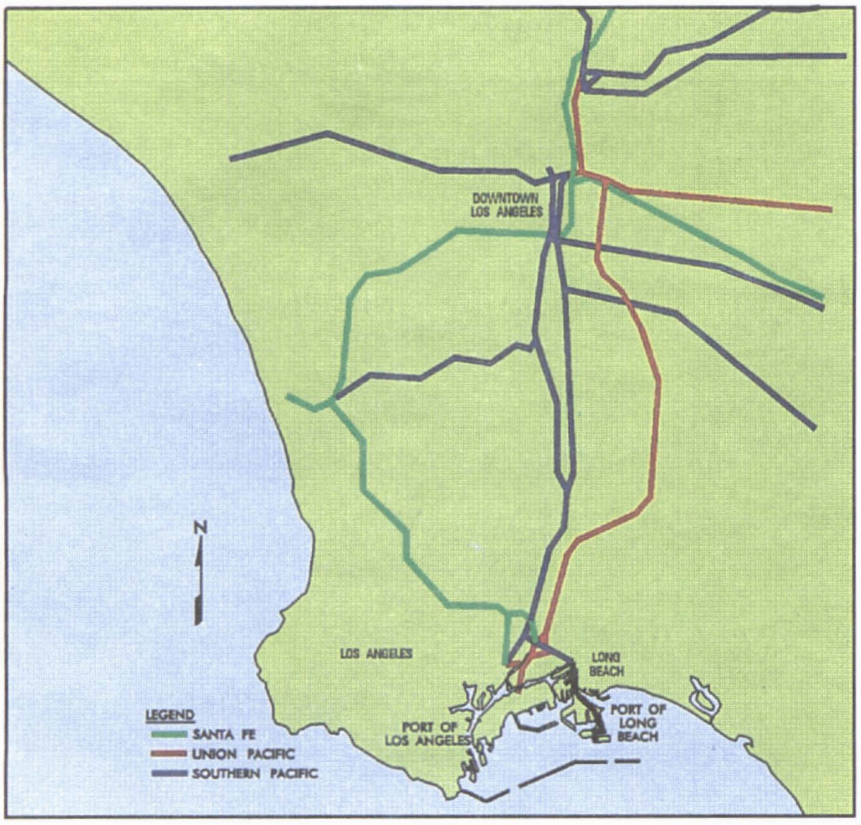
Rail

Three major rail companies serve the Long Beach area. They are Santa Fe (SF), Southern Pacific (SP), and Union Pacific (UP). The SP performs switching for all carriers.

Railyards within 5 miles of the terminals have can store more than 1,100 railcars.

Each week, at least 24 double-stack trains carry containers between Long Beach and the Midwest, gulf, and east coasts.

About 50 miles of track are on port property. Most of the trackage is owned by the port.



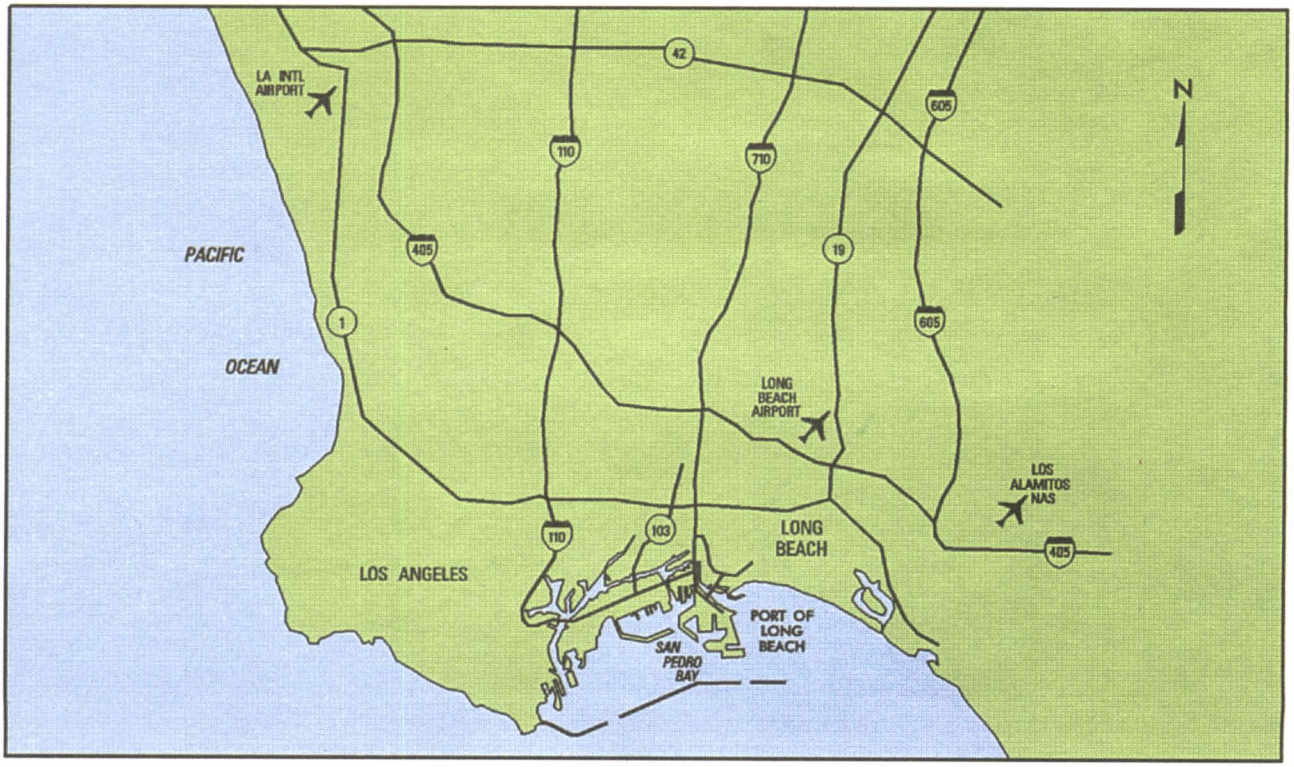
Rail Access

Airports

Several airports of various sizes and capabilities are within 30 miles of the port. The largest commercial airports are Los Angeles International and Long Beach Municipal. Long Beach Municipal Airport is closer, about 6 miles to the east of the port area. The nearest military airfield is on the Armed Forces Reserve Center, about 10 miles to the east.

MAJOR AIRPORTS NEAR THE PORT

	LOS ANGELES INTERNATIONAL AIRPORT	LONG BEACH MUNICIPAL AIRPORT	LOS ALAMITOS NAVAL AIR STATION
Main Runway:			
Length	12,000 ft	10,000 ft	8,000 ft
Width	150 ft	150 ft	200 ft



Air Access

PORT FACILITIES

Berthing

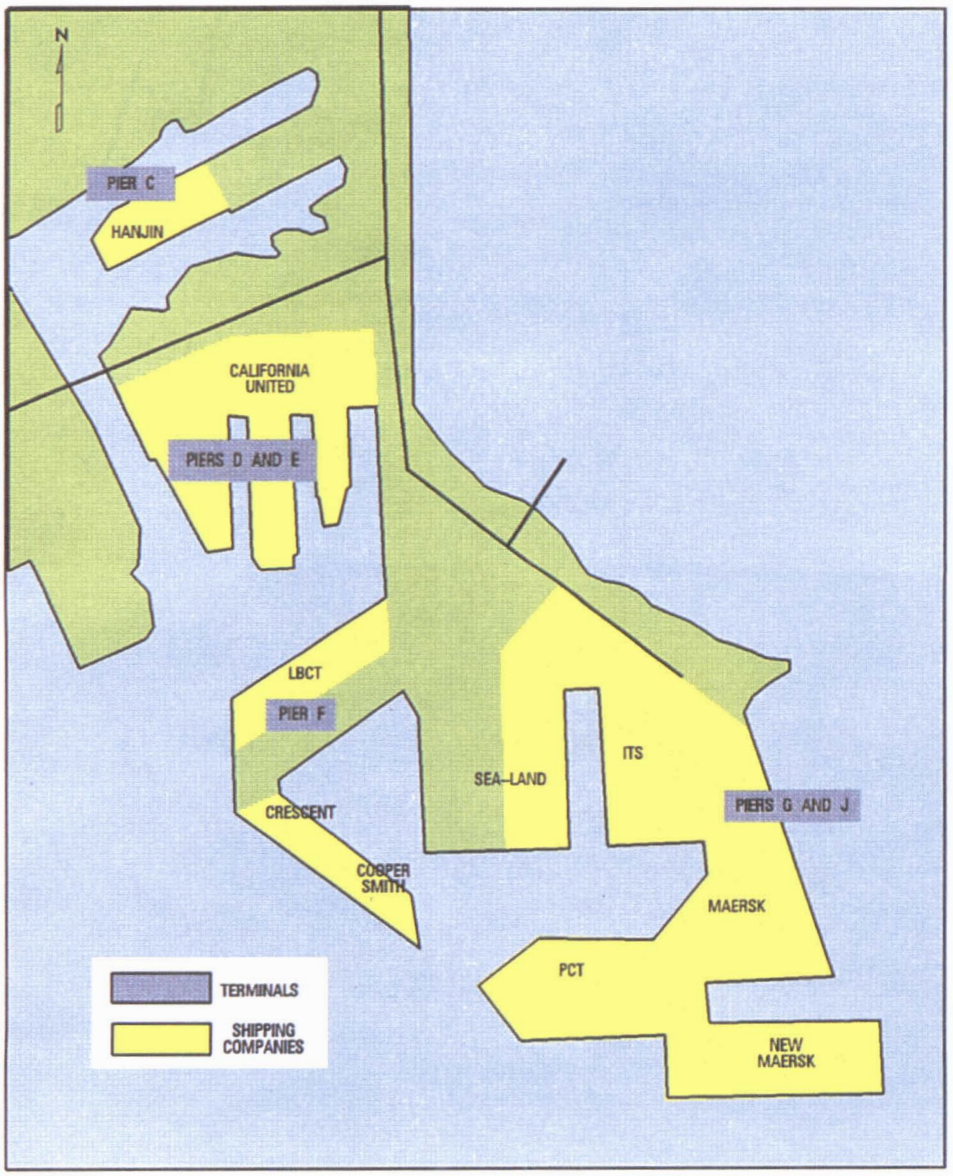
Pier construction is generally concrete piles, fronting a sheet-steel or concrete bulkhead.

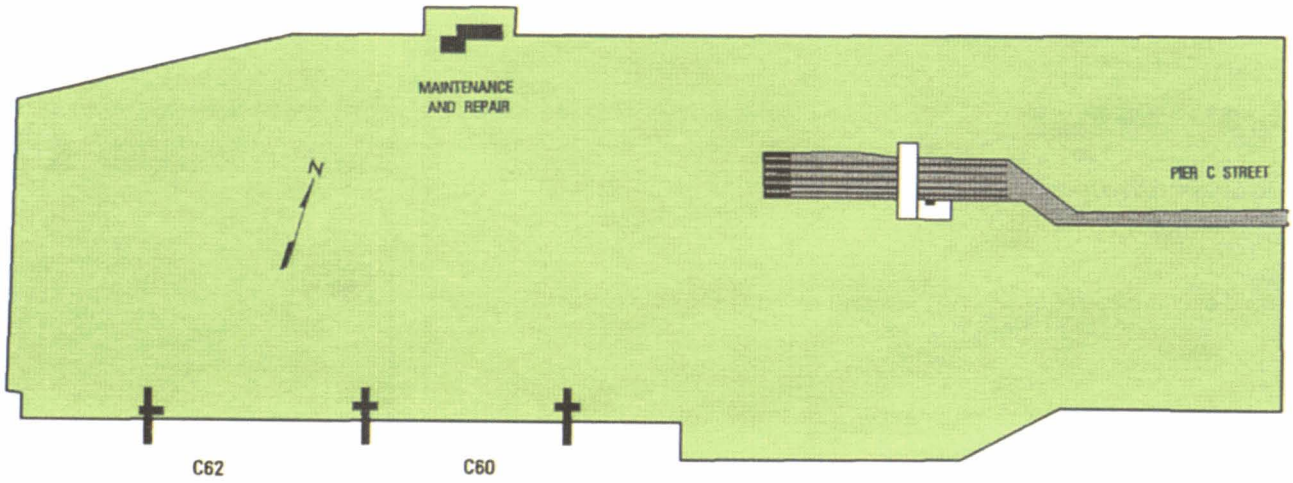
Fendering is generally timber, and the surface is generally asphalt. All terminals have lighting for night operations.

Below are land-use maps, aerial photographs, and tables of characteristics of the terminals. Pier F Terminal and Piers G and J Terminal have multiple lessors. These lessors are shown on the land-use maps.

TERMINAL OPERATIONS

TERMINAL	USE
Pier C	Container
Piers D& E	Multicargo
Pier F	Multicargo
Piers G&J	Container

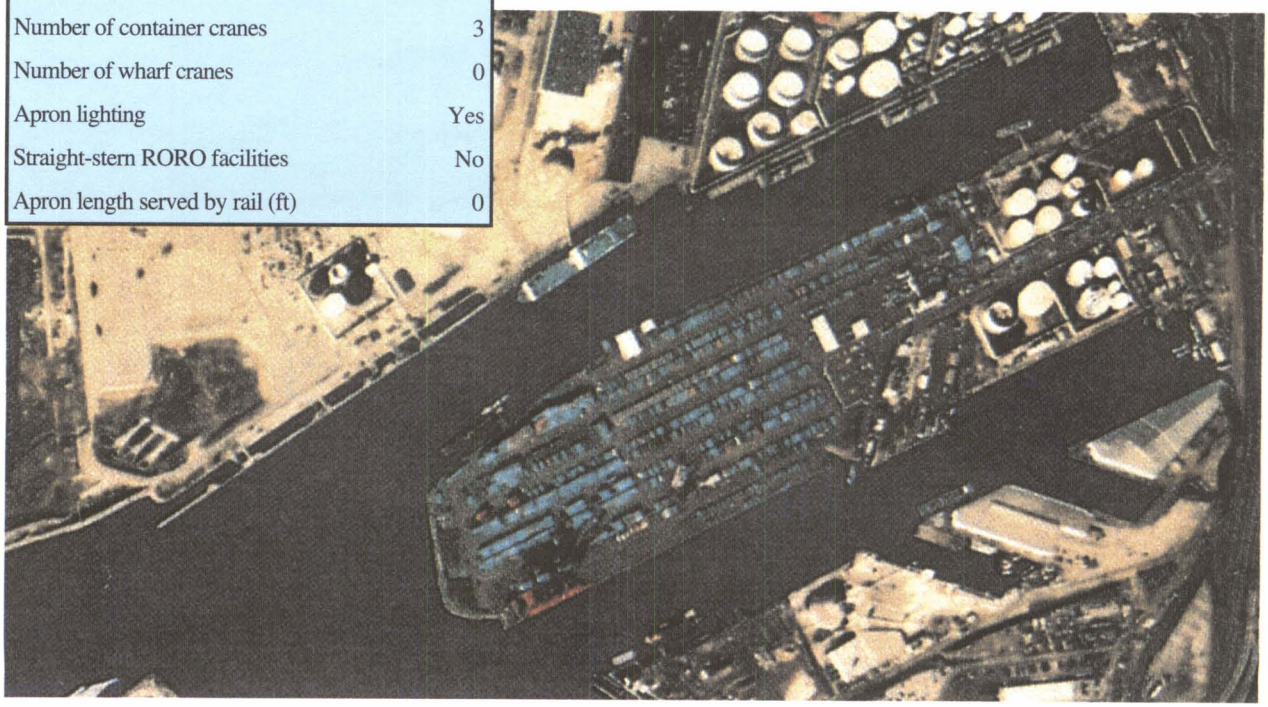




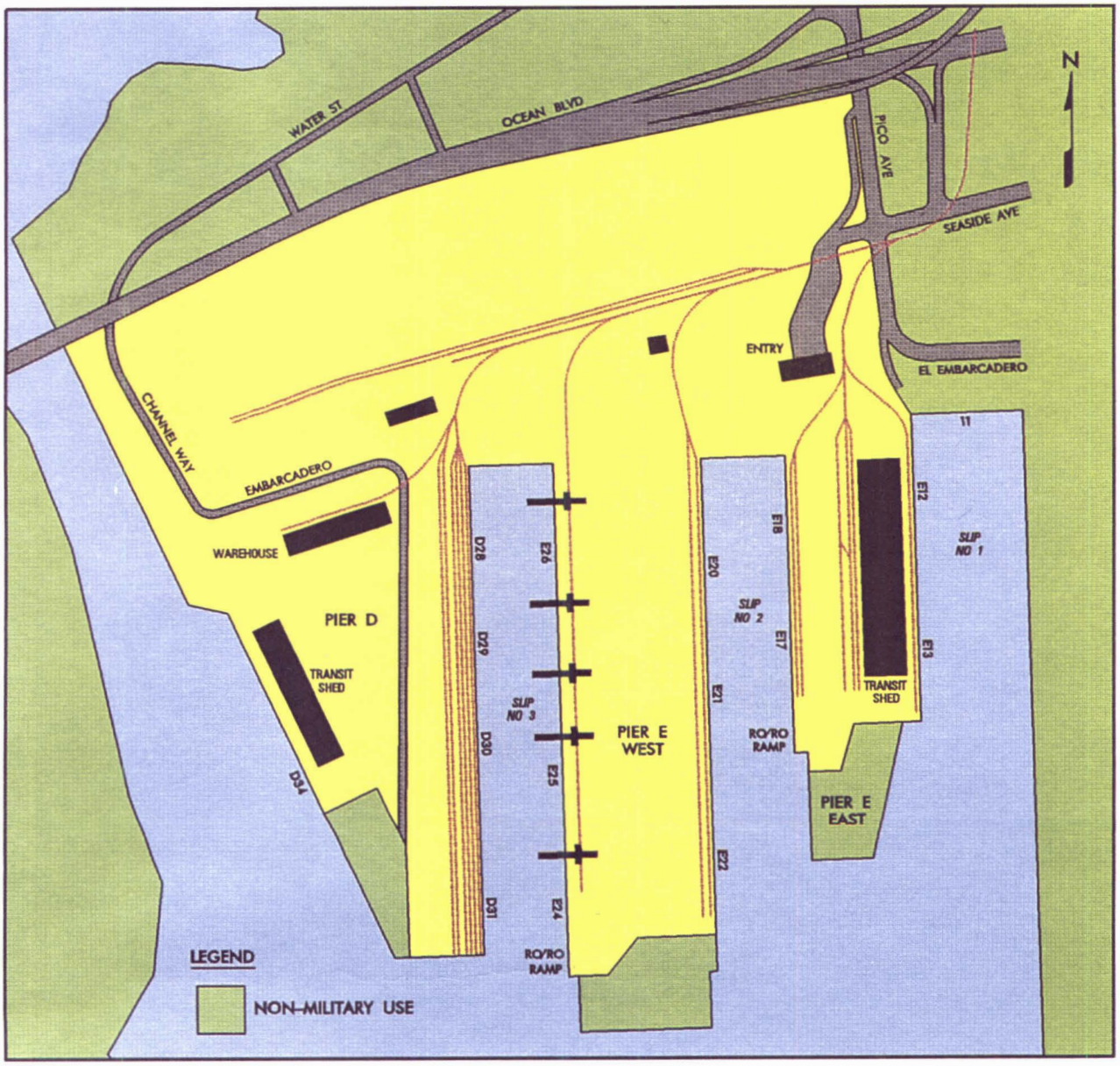
Land-Use Map for Pier C, Leased by Hanjin

PIER C TERMINAL

CHARACTERISTICS	BERTHS C60-C62
Length (ft)	1,804
Depth alongside at MLW (ft)	42
Deck strength (psf)	800
Apron width (ft)	Open
Apron height above MLW (ft)	15
Number of container cranes	3
Number of wharf cranes	0
Apron lighting	Yes
Straight-stern RORO facilities	No
Apron length served by rail (ft)	0



Pier C Terminal



Land-Use Map for Piers D and E Terminal

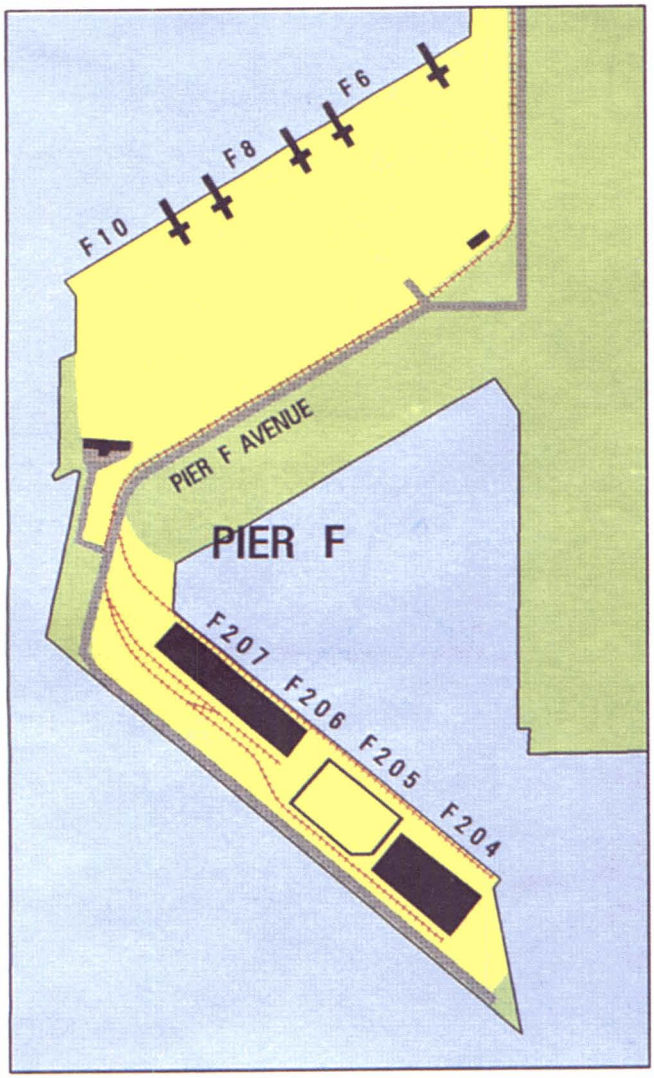
PIERS D AND E TERMINAL

CHARACTERISTICS	BERTHS					
	E12-E13	E17-E18	E20-E22	E24-E26	D28-D31	D34
Length (ft)	1,225	1,200	2,000	1,940	1,995	925
Depth alongside at MLW (ft)	40	39	40	41	45	45
Deck strength (psf)	1,000	1,000	750	750	750	750
Apron width (ft)	45	Open	Open	Open	Open	45
Apron height above MLW (ft)	20	20	16	15	9	11
Number of container cranes	0	0	0	5	0	0
Number of wharf cranes	0	0	0	0	0	0
Apron lighting	Yes	Yes	Yes	Yes	Yes	Yes
Straight-stern RORO facilities	Yes	No	No	No	No	No
Apron length served by rail (ft)	1,225	900	2,000	1,940	1,995	925

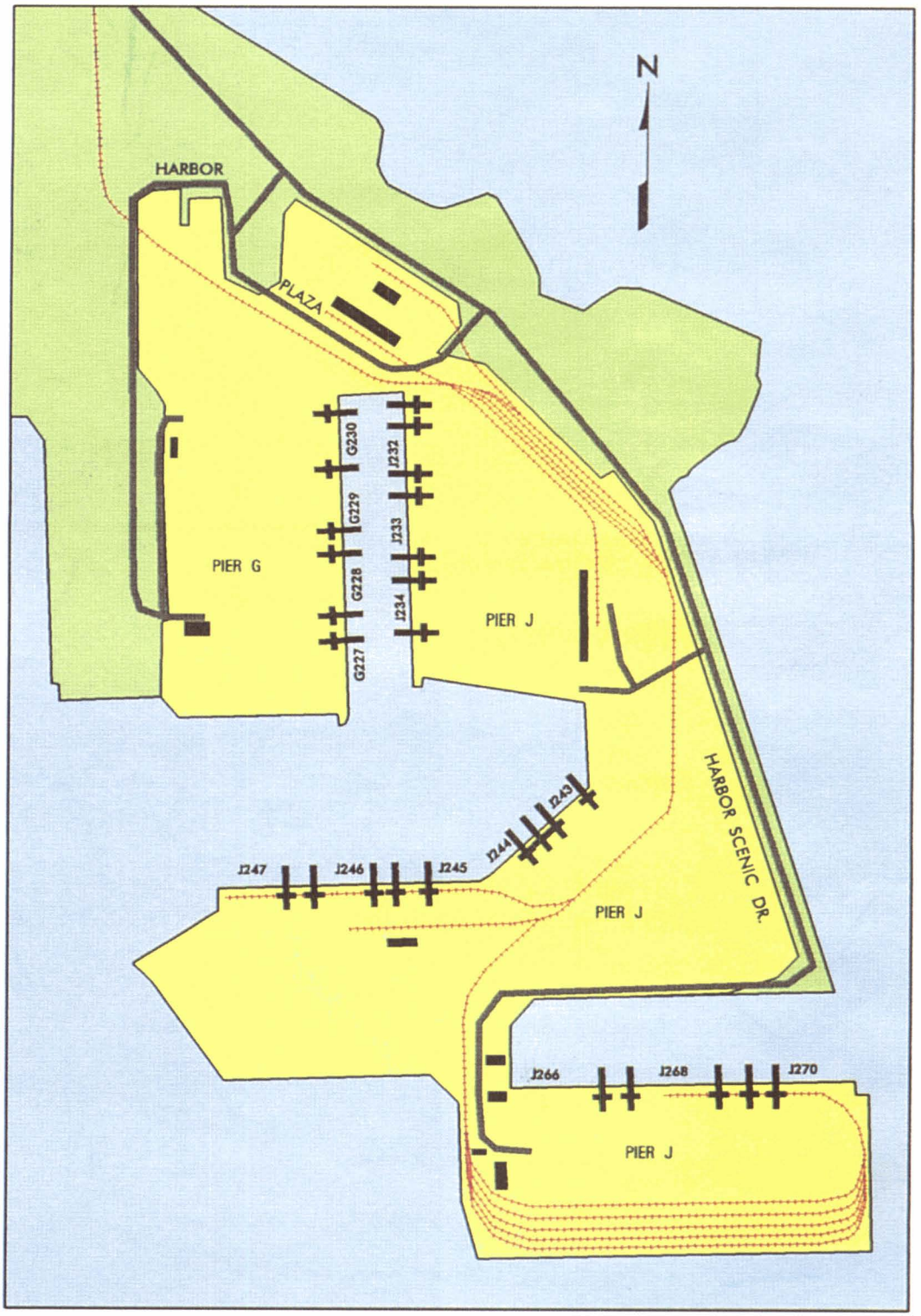
Piers D and E Terminal (Eastward View)

PIER F

CHARACTERISTICS	BERTHS		
	F6-F10	F204-F205	F206-F207
Length (ft)	2,800	1,265	1,200
Depth alongside at MLW (ft)	50	35	35
Deck strength (psf)	800	800	800
Apron width (ft)	Open	50	50
Apron height above MLW (ft)	15	19	19
Number of container cranes	5	0	0
Number of wharf cranes	0	0	0
Apron lighting	Yes	Yes	Yes
Straight-stern RORO facilities	No	No	No
Apron length served by rail (ft)	0	0	1,200



Land-Use Map and Aerial View of Pier F Terminal



Land-Use Map of Piers G and J Terminal

PIERS G AND J TERMINAL

CHARACTERISTICS	BERTHS				
	G227-G230	J232-J234	J243-J244	J245-J247	J266-J270
Length (ft)	2,600	2,300	1,200	2,100	2,700
Depth alongside at MLW (ft)	42	36	42	36	48
Deck strength (psf)	800	800	800	800	1,000
Apron width (ft)	Open	Open	Open	Open	Open
Apron height above MLW (ft)	16	16	16	16	14
Number of container cranes	6	7	4	5	5
Number of wharf cranes	0	0	0	0	0
Apron lighting	Yes	Yes	Yes	Yes	Yes
Straight-stern RORO facilities	No	Yes	No	No	Yes
Apron length served by rail (ft)	0	0	0	2,100	2,000

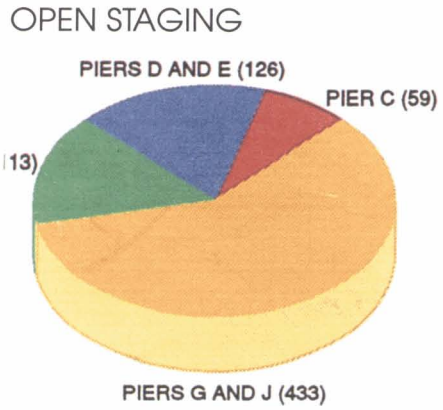
Piers G and J; New Pier J Under Construction

Staging

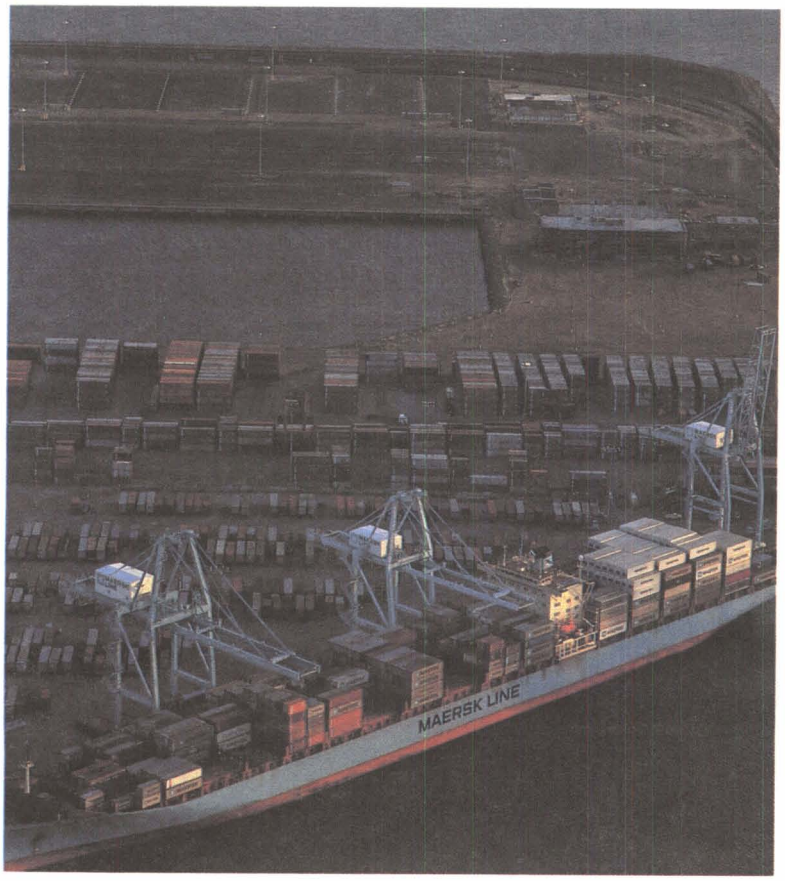
OPEN STAGING

The terminals in this report have about 730 acres of paved open staging. Most of this open area is at the Piers G and J Terminal. It is generally used for container staging.

The transit shed at berth E17-E18 or the transit shed at berth D34 is a good location for helicopter operations.



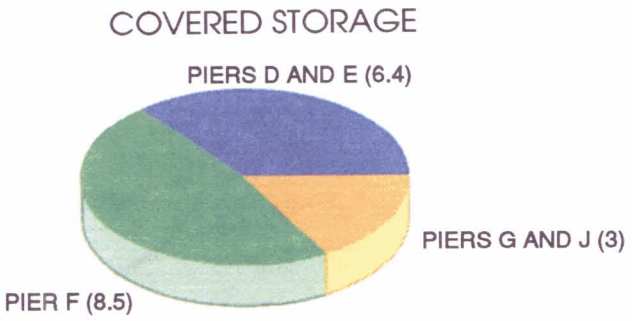
Open Staging at Pier G
(Southward View)



Open Staging at Pier J
(Southward View)

COVERED STAGING

The port has seven covered storage buildings of various sizes. These total about 780,000 square feet. Pier C does not have any buildings for covered staging.



Covered Storage at Piers D and E; California United Terminal, Berths 12-13
(Northward View)

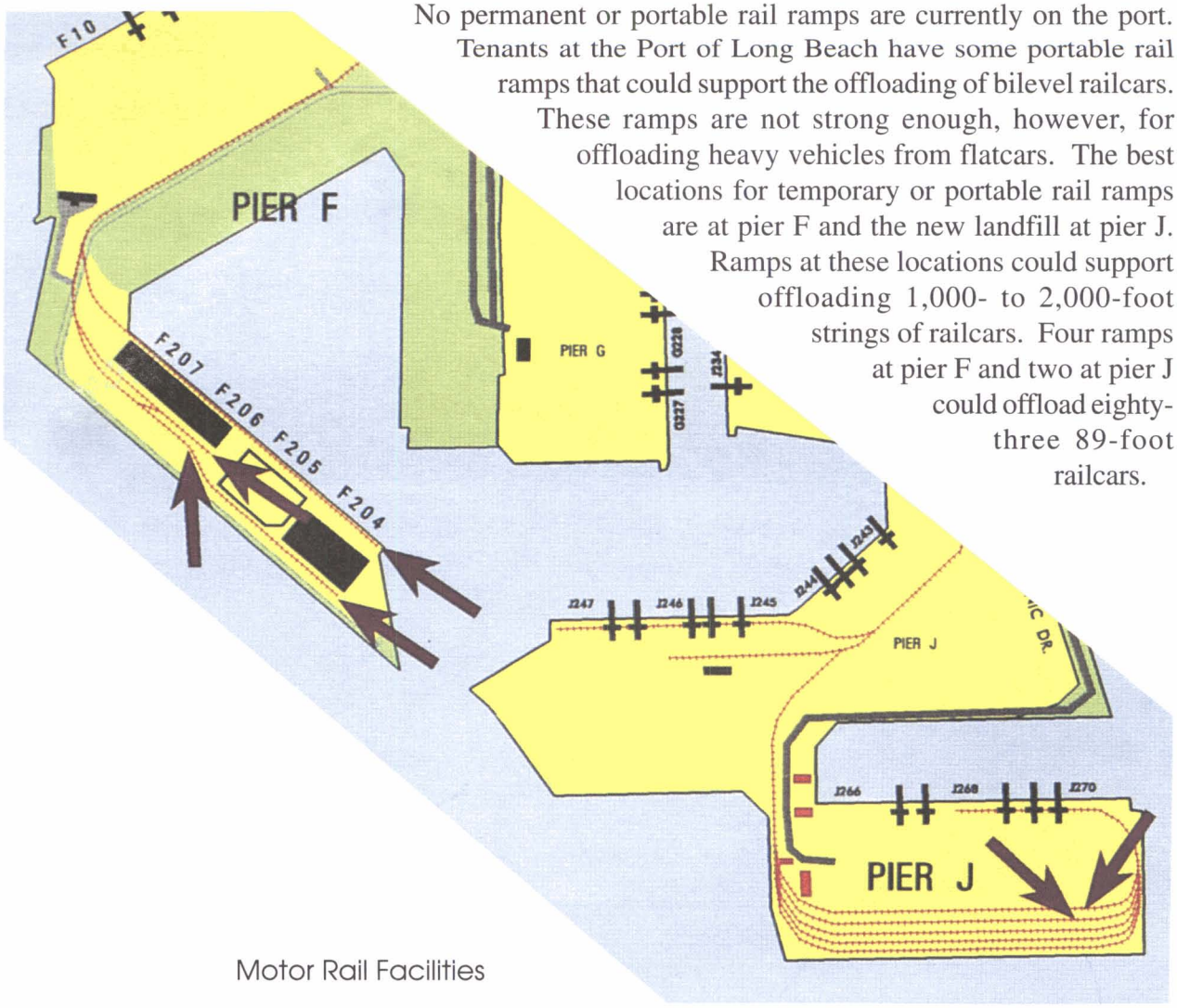
Covered Storage at Piers G and J Terminal; Sea-Land CFS near Berth G230
(Southeastward View)

Rail

Rail trackage links the railyards to port apron tracks, transit sheds, and storage tracks.

Railyards on the port have a capacity of about 400 89-foot railcars. Most of this capability is at the new nine-track Maersk Pier J Terminal. Commercial railyards within 5 miles of the port can store an additional 1,100 89-foot railcars. The Harbor Belt Line owns most of this capacity. The Port of Long Beach is the only Southern California port to offer ondock rail operations for double-stack container trains. The SP performs switching for the port.

No permanent or portable rail ramps are currently on the port. Tenants at the Port of Long Beach have some portable rail ramps that could support the offloading of bilevel railcars. These ramps are not strong enough, however, for offloading heavy vehicles from flatcars. The best locations for temporary or portable rail ramps are at pier F and the new landfill at pier J. Ramps at these locations could support offloading 1,000- to 2,000-foot strings of railcars. Four ramps at pier F and two at pier J could offload eighty-three 89-foot railcars.



Motor Rail Facilities