13. PIERS

a. Kunsan has three (3) pontoon piers (pontoon barges connected by counter balanced ramps to quay area). With advance notice barges can be reassembled to fit any operations. Ramps limit cargo width to 15 feet.

Pier A	328' long	Depth 30 to 38 feet
Pier B	410' long	Depth 30 to 38 feet
Pier C	377' long	Depth 29 to 36 feet

b. There are 7 fixed sloping piers extending 150 feet from the quay area with an apron width of 10 feet. Each pier provides only one class F berth due to the narrow apron.

c. There are three (3) quays in the Kunsan area, stoned faced with solid full aprons:

Quay #1	7200' long	Depth 0 to 6 feet
Quay #2	2100' long	Depth 0 to 12 feet
Quay #3	1500' long	Depth 0 to 3 feet

d. Changhang has two (2) pontoon piers:

Pier D	320 feet long	Depth 26 feet
Pier E	320 feet long	Depth 26 feet

e. There is one (1) quay in the Changhang Port, currently used as a ferry landing:

Quay #4	1000' long	Depth 0 to 10 feet

f. There is rail access within 100 yards from the end of Quay #3 running around the shore line to the POL facility at Quay #1. The capacity of this line is 11,880 S/T to IRI each day each way. There is also a 10 mile spur to K-8 at Kunsan.

14. POL FACILITIES

a. An Army class D facility exists at K-8 which is about 10 miles southwest of Kunsan. The connecting road is rough (gravel) due to lack of maintenance and constant use, but it is wide.

b. No. of pipe lines and size - Kunsan had a pipe line to K-8 but it was removed. JP-4 jet fuel now reaches K-8 by tank car.

c. The Army has two 6" lines from the T-1 mooring to the POL storage tanks, a distance of 750'. The discharge rate is 1700 bbls/hour at 70 PSI. (JP-4)

d. Commercial tugs available for docking.

e. Capacity of storage at Kunsan:

U.S. Army QM Depot	- 3 tanks	30,000 bbls
Korean Transportation Co.	- 1 tank	800 bbls

* There are also two barrel yards with about 100,000 sq. ft. of barrel storage area along Quay #1.

15. HANDLING EQUIPMENT

a. Kunsan -

1 crane, floating	30 tons
3 cranes, crawling	10 tons
1 crane, fixed	2 tons
1 forklift, gas	6,000 bbls

b. Changhang - 1 crane, crawler 10 tons

16. SHIPYARDS AND DRYDOCKS

a. None

17. OFFICIALS AVAILABLE

		YES	NO
a.	U.S. Consul		X
b.	U.S. Army	X	
c.	U.S. Navy		X
d.	Immigration Officials		X
e.	ABS Officials		X

18. LST BEACHING AREAS

a. There is one LST ramp discharge point at the eastern end of the port on the quay way. It is unsatisfactory for general use due to tidal range and tidal currents.

b. Geographical location - Lat. 35-59-14; Long. 126-43-22E

c. Beach and/or quarry.

d. Deadmen and bollards available, commercial tugs to assist.

e. One LST accomodated at the time.

f. Special hazards or limitations:

(1) All wheeled cargo must be offloaded within two hours of high tide. Beyond that time the bow ramp, when resting on the quay wall, will be tilted to such an angle as to prohibit offloading of vehicles.

(2) Distance between the two piers is about 110 feet. There is little maneuvering space in this area, and only one LST can offload at a time. Arrival off the quay should be coincided with high tide and the 15 minute high slack water.

19. GENERAL INFORMATION

a. Victory and Liberty type vessels may enter on all high tides using the South channel unless drawing in excess of 23 feet. MHW-Spring will permit draft up to 27 feet but 23 feet is considered the safe limit according to the harbormaster.

b. Entry to this port is recommended during daylight hours only.

c. Kunsan is not a "First Port of Entry".

d. The port is served by a single track, standard guage rail line, running 14 miles east to IRI which has rail connections to the North, South, and East. Two yards with a combined total of 1,115 feet of siding serve this port.

e. Changhang is served by a single track, standard guage rail line running 89.7 miles northeast to the main line at Chonan, one yard with 9,400 feet of siding serves this port.

f. Kunsan is served by Route #17 East to Route #21. This road is considered two-way and provides a capacity of 1682.54 S/T one-way.
* The only way to reach route #17 north from Kunsan is by passenger ferry and vehicle ferry. The vehicle ferry has a capacity of six 2½ ton trucks and crosses the Kum River about every two hours.

MASAN, KOREA

Lat. 35-11-00N Long. 128-34-00E

1. GENERAL DESCRIPTION

Masan is located on the southern coast of Korea at the head of Masan Wan, about 27 statute miles west of Pusan. Masan is one of the oldest ports of Korea with recently developed deep-water berthing facilities.

Because of its mild climate, Masan enjoys a high reputation as a health resort. The port serves as a distribution center for rice and marine products. Principle industries include salt works, a cotton reeling mill, and rice growing. A considerable number of MAP cargoes have been landed at Masan. Following the Korean Conflict this port was used as a concentration center for all types of scrap metal, shells, and disabled vehicles. During loading operations a considerable amount of scrap metal was lost overboard. Care should be exercised in going alongside due to this and to recently reported silting.

2. REFERENCE CHART

a. H.O. Chart 2508

3. PILOTS

a. Pilots are not compulsory.
b. Pilot pick-up point - Lat. 34-57-00N Long. 128-48-00E.
c. Pilots are available day and night.

4. TUGS AND LIGHTERS

a. One 320 HP tug is available.

5. COMMUNICATIONS

a. All communications are through PUSAN CONTROL, 2716 KCS.

6. NAVIGATION

a. Channel depth (LLW) - 33'
b. Channel width - 656 yards
c. Harbor depth (minimum) - 4.015 fathoms
d. Tidal range - Springs 4.9'

7. ANCHORAGE CAPACITY

a. Entrance channel, Masan Sudo: eight large vessels.
b. Inner Harbor: one large and 5 medium type vessels.
c. There is no specific ammunition anchorage, as such.

8. QUARANTINE ANCHORAGE

a. Quarantine Officials board at anchor in harbor, approximately Lat. 35-11N Long. 128-35E.

9. AMMUNITION ANCHORAGE

There is no specific ammunition anchorage as such.

10. MOORING BUOYS - None

11. BUNKERING FACILITIES

No bunkers available this port.

12. POTABLE WATER

None available.

13. PIERS

Name of Pier	Pier #1	Small Craft Pier #2	QUAY
Length (alongside)	229.6 yds	65.6 yds	1117.7 yds
Width	153.1 yds	65.6 yds	NA
Depth (alongside)	23.9'	16.4'	4.9'
Lights	No	No	No
Rails	Yes	Yes	No

14. POL FACILITIES - None

15. HANDLING EQUIPMENT

a. There is no shore based equipment available. Obtainable at Pusan.

16. SHIPYARDS AND DRYDOCKS - None

17. OFFICIALS

a. Quarantine and immigration officials available.

18. LST BEACHING AREAS

a. Location - Lat. 35-11.5N Long. 128-34.5E
b. Beach or Quay - Quay
c. Deadmen or Bollards are available.
d. Dry ramp landing - Yes, bow door discharge.

19. GENERAL INFORMATION

a. The (L)(W)(D) of the largest ship to enter this port is 661' X 90' X 34'.
b. Ships carrying ammunition are allowed to enter this port.
c. Ships may enter this port day or night.
d. This is not a "First Port of Entry".
e. There are rails and roads leading from the port to ports in the same area.
f. Masan has been considered a typhoon shelter for LST's.

MOKPO, KOREA

Lat. 34-47N Long. 126-23E

1. GENERAL DESCRIPTION

Mokpo is on the southeastern coast of Korea near the mouth of the Yongsan River. The city lies on the lower eastern slopes of Yudal San, a mountain at the head of a narrow coastal plain.

Commerce and the processing of marine and agricultural products are the main industries. Imports include general supplies, salt, grains, fertilizers, petroleum products, fish, fuel, and construction materials. Exports consist principally of grains, salt, petroleum products, straw rope and bags, fertilizer, construction supplies and general manufactures.

2. REFERENCE CHART

a. H.O. 6514, 3238, 6505
   J.O. 301, 321, 320, 221

3. PILOTS

a. Pilots are available, but not compulsory.
b. Pilot pick-up point - Lat. 34-27'N Long. 126-03'E
c. Pilots are available day and night.

4. TUGS AND LIGHTERS

a. Tugs: six, 431 HP
b. Lighters: 10, total capacity, 955 tons.
c. Sailing junks; 50, total capacity, 2,500 tons.

5. COMMUNICATIONS

a. Radio (CW) call sign - "HOTEL LIMA MIKE", 500 kcs
b. Voice call sign - Mokpo Wireless Station, 2182 kcs
c. Times guarded - 24 hours

6. NAVIGATION

a. Channel Depth (LLW) 32.6'
b. Channel Width 1,650'
c. Harbor Depth 28.7'
d. Tidal Range - Springs 14.8' Neaps 8.3'
e. Channel - Harbor hazards or obstructions: None

7. ANCHORAGE CAPACITY

It is advisable that only 3 - 10,000 ton type vessels, 2 medium type vessels and 1 medium type tanker be anchored in the harbor at one time.

8. QUARANTINE ANCHORAGE

a. Lat. 34-46-19N; Long. 126-23-20E.

9. AMMUNITION ANCHORAGE

a. Lat. 34-46-21N; Long. 126-22-42E

10. MOORING BUOYS

a. One, capacity 7,000 gross tons on full load.
b. Type Round Buoy
c. Depth of water 62.7'

11. BUNKERING FACILITIES

a. None

12. POTABLE WATER

a. By barge: 60 tons/day
b. Alongside: 30 tons/day
c. Cost per ton 44¢

13. PIERS

a.	Name	Uljong Pontoon
b.	Length	340'
c.	Width	33'
d.	Alongside depth	13'
e.	Ht. of deck above MLW	5'
f.	Lights on pier	Yes
g.	Rails on pier	No
h.	Potable water available	Yes
i.	Bunkers	No

14. POL FACILITIES

a. None

15. HANDLING EQUIPMENT

a. Shore side crains: None
b. Floating Crain: One steam driven 60 ton capacity, maximum vertical lift above waterlevel 99 feet.

16. SHIPYARDS AND DRYDOCKS

a. None

17. OFFICIALS AVAILABLE

	YES	NO
a. U.S. Consul		X
b. U.S. Army		X
c. U.S. Navy		X
d. Quarantine Officials	X	
e. Immigration Officials	X	
f. ABS Officials		X

18. LST BEACHING AREAS

a. Located North of harbor.
b. Quay.
c. Deadmen and Bollards are available.
d. Accomodate two LST's.
e. Dry ramp landing available.
f. Tugs are available for assistance.
g. No special hazards or limitations.

19. GENERAL INFORMATION

a. Largest ship ever accomodated (L) 650' (W) 70' (D) 36'
b. Ships carrying ammunition may enter port.
c. Ammunition discharge location: Lat. 34-46-21N; Long. 126-22-42E
d. Ships are allowed to enter port to discharge general cargo if ammunition destined for the next port is a part of the cargo.
e. Ships may enter day or night.
f. This is a first port of entry.
g. No special harbor rules or regulations.
h. There is a single track railroad from Mokpo to Songjongri 71 km. There is one highway and two poor roads leading from Mokpo.
i. Local plans and charts are available.

POHANG, KOREA

Lat. 36-03N Long. 129-23E

1. GENERAL DESCRIPTION

Pohang, located at the river mouth on the southwestern side of Yongil Man, had a population of about 70,000 in 1962. The main quay, 1,765 feet long, can berth vessels of less than 500 tons and has a depth of 10 to 12 feet alongside. The secondary quay, southward of the main quay and 1,920 feet long, is used by fishing boats. Numerous wooden piers extend from the quay which can berth vessels up to 200 tons but the depths alongside are less than 10 feet. Cargo transfer is hampered by a swell during March, April, September and October.

The town is connected with the main railroad system of Korea, and coastal steamers call regularly. Telegraph and telephone services exist.

2. REFERENCE CHART

a. H.O. Chart Number HO 5669

3. PILOTS

a. None

4. TUGS AND LIGHTERS

a. Five tugs: 1 - 240 HP
4 - 50 - 100 HP
b. Lighters: 50 - 60 S/T wooden
c. Barges: 3 - 140 S/T steel

5. COMMUNICATION

a. None

6. NAVIGATION

a. Channel Depth - 9.8 to 13.1'
b. Channel Width - 37.8'
c. Harbor Depth - 9.8 to 13.1'
d. Tidal Range: Springs 1' Neaps .6'
e. Channel - Harbor hazards or obstructions: None

7. ANCHORAGE CAPACITY

a. None within the inner harbor.
b. Unlimited free swinging berths for all types of vessels are available in Yongil Bay in depths ranging from 5 - 16 fathoms; the bottom consisting of mostly mud and sand, provides good holding ground.

c. The 5 fathom curve is within one mile of the harbor entrance.
d. All deep draft vessels, must be worked in the stream.
e. The anchorage is exposed to the northeast and has no protection from adverse winds from that direction.

8. QUARANTINE ANCHORAGE

a. Lat. 36-02-20 Long. 129-23-15E

9. AMMUNITION ANCHORAGE

a. Lat. 36-02-00N Long. 129-24-30E

10. MOORING BUOYS

a. None

11. BUNKERING FACILITIES

a. Small craft may be fueled from 3 storage tanks located behind the northern port of Quay #3

12. POTABLE WATER

a. None available by barge. Limited amount available at the Chong Buk ice plant.

13. PIERS

a. There are no deepwater piers or wharves, but the Northern and Western shore of the harbor provide approximately 6,000 lineal feet of Quayway with alongside depths ranging from 0 to 14 feet.

b. There are 4 Quays - a combination of 3 at the Northern end of the harbor and a 4th at the Southern end fronting the town. They are about 3½ feet above water level.

c. About 2,300 lineal feet of the Quayway, between Quays #3 and #4 would be unuseable for general cargo operations due to shallow depths alongside, narrow apron, and poor clearance roads. This Quay is used mostly by fishing vessels and small indigenous craft.

d. Quays

QUAY	LENGTH	DEPTH
#1	970 feet	6-10
#2	525 feet	7-11
#3	696 feet	5-12
#4	1913 feet	5-14
Fishing	2295 feet	0.7-3
Wharf	Unuseable for cargo operations. (see para. c)	

e. These Quays are stone faced with concrete aprons averaging about 20 feet in width. The remaining Quay width and open space in the Quay areas consists of dirt and gravel fill.

f. Quay #3 is served by a railsiding. This Quay is narrow and has numerous shops and warehouses fronting the Quay area.

g. Quay #4 is adjacent to the town and would be by far the best wharf for military type cargo operations. Location of warehouses, general condition of the area, and port clearance is good.

14. POL FACILITY

a. Four buoy tanker mooring has been established in Yongil Bay to serve the U.S. Army POL installation at Pohang. This mooring is centered at approximately 36-02.9N 129-26.8E in about 40 feet of water.

b. Four green buoys mark the anchorage and a black conical buoy marks the seaward end of a 12" submarine pipe line.

c. There are ten 10,000 bbl oil tanks and plans for 24 additional tanks to be completed at some future date. The final installation will have a capacity of 340,000 bbl and will handle four types of fuel.

d. There is a pipeline from the tank farm to a shoreside pumping station thence to the tanker berth in Yongil Bay.

15. HANDLING EQUIPMENT

1 - Crane, Floating - 30 ton
2 - Crane, Crawler - 20 ton
1 - Crane, Mobile - 10 ton
2 - Crane, Dredge - 20 ton (Cranes mounted on barge and currently engaged in dredging operations)
1 - Forklift capacity 5,000 lbs

16. SHIPYARDS AND DRYDOCKS

a. None

17. OFFICIALS AVAILABLE

	YES	NO
a. U.S. Consul		X
b. U.S. Army		X
c. U.S. Marine Corps	X	
d. U.S. Navy		X
e. Quarantine	X	
f. Immigration		X
g. A.B.S.		X

18. LST BEACHING AREAS

a. None

19. GENERAL INFORMATION

a. The largest ship to call Pohang: SS PRESIDENT JACKSON (L) 564' (W) 76' (D) 30'.
b. Ships carrying ammunition are allowed to enter port.

c. Two ammunition discharge anchorages:
   Lat. 36-02-00N; Long. 129-24-30E
   Lat. 36-03-45N; Long. 129-24-30E
d. Ships may enter to discharge general cargo if ammunition destined for the next port is a part of the cargo. The cargo must be discharged in the stream. As yet no ammunition ships have called at Pohang.
e. Ships may enter day or night.
f. This is not a first port of entry.
g. No special port or harbor rules.
h. There are rails and highways leading from this port.

PUSAN, KOREA

Lat. 35-05N Long. 129-06E

1. GENERAL DESCRIPTION

The city of Pusan is located approximately 180 miles southeast of the capitol city of Seoul by air and approximately 110 miles from Moji, Japan by sea. Pusan is the main harbor for the southern portion of Korea and the second largest city of the Republic of Korea, having a population of about one million. The port consists of an inner and outer harbor, the former being protected by a breakwater. A large airfield (K9) is located about 9 miles by vehicle from the port area. There is a main railroad line which terminates in Pusan and which connects practically all points in Korea.

2. REFERENCE CHART

a. H.O. Chart No. 6497, 5312, and 5460

3. PILOTS

a. Pilots are compulsory.
b. Pilot pick-up point - 35-05N; 129-06E.
c. Pilots are available day and night.

4. TUGS AND LIGHTERS

a. Tugs: One 1900 HP, U.S. Army tug; two 600 HP, U.S. Army tug; two commercial tugs, 650 HP.
b. Lighters: 73 lighters available - 8 flat tops, capacity 1400 tons; 65 hollows, capacity 6850 tons

5. COMMUNICATIONS

a. No radio call sign.
b. Voice call sign "PUSAN CONTROL", 2716 KCS
c. Times guarded - 24 hours

6. NAVIGATION

a. Channel depth (LLW): 33'
b. Channel width: 200 yards
c. Harbor depth (minimum): 24'
d. Tidal range: Springs 3.9' Neaps 2.4'
e. Navigational Comments:
   (1) Anchorage obstructions in channel near breakwater. Marked by buoy.

7. ANCHORAGE CAPACITY

a. Inner harbor: 8
b. Outer harbor: 10 plus

8. QUARANTINE ANCHORAGE

a. Location - Lat. 35-06-00N Long. 129-05-30E

9. AMMUNITION ANCHORAGE

a. Area: Lat. 35-08-00N Long. 129-07-00E

10. MOORING BUOYS - None

11. BUNKERING FACILITIES

a. Available only in emergency.
b. Available by barge and alongside.
c. Class C

12. POTABLE WATER

a. Available by barge and alongside.
b. Cost per gallon or ton - 76 won/hour 300 - 400 tons

13. PIERS

a. General Cargo

Name or Number	1	2	Quay 2	3	4
Length	1250'	1300'	800'	1850'	1850'
Width	385'	385'	NA	478'	500'
Depth alongside	32'	32'	33'	30'	28'
Lights on piers	YES on all Piers				
Rails on Piers	YES on all Piers				
Potable water	Water barge only				
Bunkers	Available thru U.S. Army only				

14. POL FACILITIES

Name or Number	Yong Do	B-23	B-25
No. of pipe lines	3	2	4
Size pipe lines	8"	8"	3-8" 1-6"
Type product received	NSFO DFM	NSFO DFM	NSFO DFM MOGAS

15. HANDLING EQUIPMENT

a. There are 27 shorecranes consisting of portal jib, and mobile cranes varing from 1 - 30T capacity.
b. Floating cranes: 7 varing from 30 - 150T capacity.

16. SHIPYARDS AND DRYDOCKS

a. Length - 38' X 70' X 148' / 20' X 88' X 496
b. Width at entrance - 62'; 73'
c. Depth over sill - 24'7"; 32'

17. OFFICIALS

		YES	NO
a.	U.S. Consul		X
b.	U.S. Army	X	
c.	U.S. Navy	X	
d.	Quarantine Officials	X	
e.	Immigration Officials	X	
f.	A.B.S. Officials	X	

18. LST BEACHING AREAS

		BP 43	LST Beach	BP 34
a.	Beach or Quay	beach	quay	beach
b.	Deadmen or bollards	none	none	none
c.	Number of LSTs accomodated	1	2	1
d.	Dry Ramp Landing	yes	yes	yes
e.	Tugs are available to assist.			

19. GENERAL INFORMATION

a. The (L)(W)(D) of the largest ship to be accomodated this port was 645' X 84' X 30', SS ORION COMET
b. Ships carrying ammunition are not allowed to enter port.
c. Ships may enter this port day or night.
d. This is considered a "First Port of Entry".
e. The highway connecting Pusan northward with Ulsan and Pohang is a principle highway which runs through the center of Pusan. A highway westward also connects Pusan with Chin Hae, Masan, and other cities to the west, Seoul, Taejun, and Taeju may be conveniently reached by rail with five scheduled passenger trains in service.

SUYONG, KOREA

Lat. 36-08-00N Long. 129-07-00E

1. GENERAL DESCRIPTION

Suyong harbor, which is due east of Pusan, is approximately 7 miles by sea from the Pusan breakwater. Part of the anchorage area is on a direct line with the take-off runway at the K-9 Air Field. The entire harbor is exposed to southerly and easterly winds. Prior to approaching Suyong clearances should be obtained from the authorities at Pusan.

2. REFERENCE CHART

a. H.O. Chart Numbers 6140 and 5460

3. PILOTS

a. Pilots are available, but are not compulsory.
b. Pilot pick-up point - 35-50-00N 129-06-50E
c. Pilots are available - daytime only

4. TUGS AND LIGHTERS

a. Obtained from Pusan authorities.

5. COMMUNICATIONS

a. "PUSAN CONTROL", 2716 KCS

6. NAVIGATION

a. Channel Depth (LLW) - 7 fathoms.
b. Channel Width - 480 meters.
c. Harbor Depth (minimum) - 1.5 meters.
d. Tidal Range - Springs 4' Neaps 2.75'
e. Channel/Harbor hazards:
(1) Shoals at various points around the channel and ammunition that has fallen into the bay during operations.

7. ANCHORAGE CAPACITY

a. Four large ships.
b. Quarantine anchorage and ammunition anchorage inclusive.
c. Location - Lat. 35-08-50N Long. 129-08-50E

8. QUARANTINE ANCHORAGE

a. Quarantine at Pusan.

9. AMMUNITION ANCHORAGE

a. Approximately - Lat. 35-08-00N Long. 129-07-00E

10. MOORING BUOYS

a. Capacity - Barges and other craft of this size.
b. Can - square
c. Water Depth - 7.5 meters.

11. BUNKERING FACILITIES

a. Available from Pusan by barge.

12. POTABLE WATER

a. Two barge - 300 ton and 50 ton capacity. Not too reliable. Barges are from Pusan.

13. PIERS

a. One pier suitable for general cargo operations is located on the east side of the bay. Used primarily for offloading barges from ships at the ammunition anchorage, LST's can come alongside if weather permits.
b. Length of Pier - 140'
c. Alongside depth - LW 1 to 2 meters, varying.
d. Rail Terminal available 2 miles from pier.
e. Capacity of heaviest shore based crane - 20 Ton Wrecker. Crane located at 609th ORD - Approximately 2 miles.

14. POL FACILITIES - None

15. HANDLING EQUIPMENT

a. None, nearest in Pusan

16. SHIPYARDS AND DRYDOCKS

a. None, nearest in Pusan

17. OFFICIALS AVAILABLE

a. Officials available from Pusan.

18. LST BEACHING AREAS

a. Location - Alongside pier on east side of bay.
b. Beach or Quay - Quay.
c. Bollards Available.
d. Number LST's accomodated - one
e. Special Limitations - Due to depth of water surrounding the pier, ground swells occasionally cause the LST to bounce on the bottom if heavily loaded.

19. GENERAL INFORMATION

a. The (L)(W)(D) of largest ship to be accomodated this port was 500' X 70' X 26', 7,000 gross tonnage.

b. Ships carrying ammunition are allowed to enter.

c. Ships may enter this port only during daylight.

d. Suyong is not a "First Port of Entry".

e. There are highways leading from Suyong to Pusan.

f. Suyong is used almost exclusively for ammunition operations, and with few exceptions the equipment and services provided for these operations come from Pusan. Refer to the Pusan section of Port Directory for further information.

ULSAN, KOREA

Lat. 35-30-50N Long. 129-23-00E

1. GENERAL DESCRIPTION

Ulsan, an inlet roughly 1 mile wide and 4½ miles long, with lower and upper bays, lies on the western side of the rugged peninsula which terminates about 2 miles southwestward of Wigi. It has a depth of 6 to 8 fathoms in the middle of its southern part with good holding ground. The only off-lying dangers are four areas, covered by depths of 1 3/4 to 3 fathoms, located within the 5 fathom curve in the central part of the upper bay.

Ulsan City, located about 2½ miles upstream from the mouth of the T'aehwa Gang (Taiwa Ke), a shallow river flowing westward into the head of Ulsan Man, has an approximate population of 50,000. It is connected by railroad to the main system of Korea. The Korea Oil Storage Company has operated a storage terminal at Ulsan since 1955 but is currently being phased out due to the construction of an oil refinery in the same area by the Korea Oil Company.

2. REFERENCE CHART

a. H.O. Charts #3241, 5463.

3. PILOTS

a. Two pilots available.
b. Will board at harbor limits.

4. TUGS AND LIGHTERS - None

5. COMMUNICATIONS - None

6. NAVIGATION

a. Channel depth (MLW): 25'
b. Channel width: 120 yds to 330 yds.
c. Harbor depth: 24'
d. Tidal range: Springs 4' normal 2.5'
e. Harbor hazards or obstructions: Fishing nets with large floats are often placed in mid-channel making entry or exit at night or poor visibility inadvisable. The nets have no set pattern and may be moved from day to day.

7. ANCHORAGE CAPACITY

A-1	A-2	A-3	A-4
35-28-34	35-29-18	35-29-27	35-30-24
129-23-42	129-24-16	129-23-22	129-24-00
8 fm. 230 yds	6 fm. 275 yds	1.3 fm. 230 yds	4.4 fm. 230 yds

B-1	B-2	B-3	B-4
35-30-17	35-30-35	35-30-47	35-30-53
129-23-26	129-23-24	129-23-47	129-22-56
4.1 fm. 100 yd	4.1 fm 100 yd	3.2 fm.100 yd	3.3 fm.100 yd

8. QUARANTINE ANCHORAGE

Lat. 35-20-50N Long. 129-26-02E

9. AMMUNITION ANCHORAGE - None

10. MOORING BUOYS - None

11. BUNKERING FACILITIES

a. DFM, NSFO, and Bunker "C" are available alongside POL Pier or at anchorages delivered by 5,000 bbl barges.

12. POTABLE WATER - None

13. PIERS

Number	one
Length	500 feet
Width	30 feet
Depth alongside	24 feet
Ht. of dock above (MLW)	6 feet
Lights on pier	Yes
Rails on Pier	Yes
Potable water	No
Bunkers	Yes

14. POL FACILITIES

Number	one
Number of lines	six
Size pipe lines	six inch
Type product received	light oils (JP4, Kerosene, MoGas)
Capacity of tanks	Kerosene: 55,000 bbls
	JP4: 40,000 bbls
	MoGas: 155,000 bbls

15. HANDLING EQUIPMENT - None

16. SHIPYARDS AND DRYDOCKS - None

17. OFFICIALS AVAILABLE

a. Immigration, Customs, Quarantine.

18. LST BEACHING AREAS

a. Location: 35-30-50N 129-23-00E; East of KOCO Fuel Pier
b. Type: Beach
c. Two Bollards available.
d. Accomodate one LST.
e. Dry ramp loading: No
f. No tugs available.
g. No special hazards or limitations.

19. GENERAL INFORMATION

a. Largest ship accomodated: (L) 325', (W) 70', (D) 24'
b. Ships carrying ammunition are not allowed to enter port.
c. Ships may enter day or night.
d. No special port or harbor rules.
e. There is one rail and one road leading from Ulsan Port to Ulsan City.

YOSU, KOREA

Lat. 34-44-00N Long. 127-44-20E

1. GENERAL DESCRIPTION

Yosu is located on the southern tip of Korea, about 97 miles west of Pusan. The port serves both fishing and commercial shipping.

2. REFERENCE CHART

a. H.O. Chart numbers 6528 and 5458

3. PILOTS

a. Pilots are available but are not compulsory.
b. Pilot pick-up point - approximately 1500 yards north of Odong Do Light, or at Pusan.

4. TUGS AND LIGHTERS

a. Tugs: One 650 HP (86 feet long - ex. U.S. Army ST diesel)
b. Lighters: 14 wooden barges, 50 tons
4 wooden barges, 100 tons
22 wooden barges, 150 tons
2 wooden barges, 200 tons

5. COMMUNICATIONS

a. All communications are through "PUSAN CONTROL", 2716 KCS.

6. NAVIGATION

a. Channel Depth: minimum 6 fathoms.
b. Channel Width: 4,000 yards.
c. Harbor Depth: (minimum) 20' - 36'
d. Tidal Range: Springs 11' Neaps 8'
e. Harbor hazards or obstructions: Yosu is an open harbor and affords shelter to vessels drawing less than 27' from all quadrants except NE. A two fathom shoal in harbor is marked by a lighted buoy.

7. ANCHORAGE CAPACITY

a. Vessels can anchor as convenient in the north harbor.
b. Southward of the breakwater linking the mainland with Odong Do.
c. Vessels can anchor within the area northward of Odong Do to await custom's clearance or discharge cargo.

8. QUARANTINE ANCHORAGE - 1500 yards north of Odong Do Light.

9. AMMUNITION ANCHORAGE

a. Information not available.

10. MOORING BUOYS

a. Not available

11. BUNKERING FACILITIES - None

12. POTABLE WATER

a. Alongside only - fresh water should be treated.
b. Rate - 30 tons per hour; Cost - 40 won per ton.

13. PIERS

Name of pier	Railroad pier	Quay wall
Length (Alongside)	390'	550 yards
Width	120'	150'
Depth (Alongside)	20'	24'
Lights on pier	Yes	Yes
Rails on pier	Yes	Yes

14. POL FACILITIES - None

15. HANDLING EQUIPMENT

a. There are no shore based cranes available.

16. SHIPYARDS AND DRYDOCKS - None

17. OFFICIALS AVAILABLE

a. Quarantine and Immigration Officials are available. Other Officials available from Pusan.

18. LST BEACHING AREAS

a. In the past LST's have utilized the following areas for beaching:
200 yards south of the Railroad Pier
750 yards north of the Railroad Pier
At that time beaching operations were considered satisfactory.
No beaching has been accomplished in recent years.
b. LST's normally discharge at the Quay Wall.
c. Dock space is available for 10 LST type ships in the 15th ROK Hospital area.

19. GENERAL INFORMATION

a. The (L)(W)(D) of the largest ships to be accomodated this port was 475' X 63' X28'.
b. Ships carrying ammunition are allowed to enter this port.
c. Ships may enter port day or night.
d. There is one road leading from Yosu to Pusan, but it is dirt and very narrow and very rough.
e. There are rails leading to Pusan. Enroute time is approximately 10 hours.

BUCKNER BAY, OKINAWA

Lat. 26-13N Long. 127-55E

1. GENERAL DESCRIPTION

Buckner Bay, located on the east coast of Okinawa, is used as an anchorage for deep draft naval and commercial ships. The harbor is large and deep, but offers protection from the wind. There is one usable pier located at White Beach on the northern shore of Buckner Bay. This pier is generally referred to as BRAVO PIER. There is a draft limitation of 32 feet alongside pier Bravo; with a length limitation of: 600 feet East side and 500 feet West side.

2. REFERENCE CHART

a. H.O. 2338-6132-6133

3. PILOTS

a. Pilotage is compulsory.
b. Pilots are available day and night (night emergency only).

4. TUGS AND LIGHTERS

a. Tugs: One LT (1200hp) usually berthed at BRAVO PIER; additional tugs as needed available from Naha.
b. Lighters: None, but available as needed from Naha.

5. COMMUNICATIONS

a. Radio call sign - "ALFA DELTA DELTA THREE", 2670 kcs (CW/Voice).
b. Voice call sign - "ALFA DELTA DELTA THREE", 2330 kcs (voice)
"ALFA DELTA DELTA TWO", call on 500 kcs to establish working frequency.
c. Times guarded - 24 hours

6. NAVIGATION

a. Channel Depth: 44'
b. Channel Width: 9,504'
c. Harbor Depth: 44'
d. Tidal Range: Springs 5.4' Neaps 2.2'
e. Navigation Comments:

(1) Harbor Hazards: lighted; Seaplane Lanes (marked on chart)

7. ANCHORAGE CAPACITY

a. Unlimited

8. QUARANTINE ANCHORAGE

a. Area - Lat. 26-15-48N Long. 127-54-16E

9. AMMUNITION ANCHORAGE

a. None

10. MOORING BUOYS

a. None

11. BUNKERING FACILITIES

a. Barge: yes, by special arrangement only (from Naha) BG @4000
b. Alongside: yes (BRAVO PIER)
c. Cost per bbl: Government - $2.436/bbl; Comm'l. - Not available.
d. Pumping capacity per hour: 3500 bbl.

12. POTABLE WATER

a. By Barge: No
b. Alongside: Yes
c. Cost per ton: DOD agency - $0.15; Commercial $0.50.
d. Pumping capacity per hour: 50 ton/hr.

13. PIERS

a. General Cargo

Buckner Bay has one pier located at WHITE BEACH (BRAVO PIER).

NAME	BRAVO PIER (East and West)
LENGTH	600' east; 500' west
WIDTH	75'
DEPTH ALONGSIDE	32' both sides
HT. OF DECK ABOVE MLW	8"
LIGHTS ON PIER	Yes
RAILS ON PIER	No
POTABLE WATER AVAILABLE	Yes, through pier line
BUNKERS	Yes, NSFO through shore fac; DFM by YO.

b. BRAVO PIER is also the AMMO DISCH/LOAD pier for Okinawa.

14. POL FACILITIES

a. Depth alongside: 32'
b. Limiting size of vessel: Length 700' Draft 31'
c. No. of pipe lines and size: two 8" lines connecting to one 12" line on the pier.
d. Load and Discharge rates: Disch. 32,000 bbl/hr NSFO Load 2500 bbl/hr NSFO
e. Army, Navy, Air Force, and/or commercial installations: USAQMPOL and USATG subport.
f. Tugs available for docking-military USATG.
g. Storage capacity NSFO: 130M; (9) 10M tanks and (1) 40M tank.
h. Berthing: Daylight hours only.
i. No facilities available for discharge of ballast or sludge.
j. Comments: No moorings; berthside discharge only, through tankers pumps to two 8" hoses to a 12" line on the pier leading approximately 1 mile to the tank farm.

15. HANDLING EQUIPMENT

a. One 40 ton crawler crane, 30' boom, 10' radius, available on pier.
b. Forklifts: on call from Naha.

16. SHIPYARDS AND DRYDOCKS

a. None

17. OFFICIALS AVAILABLE

		YES	NO
a.	U.S. Consul	X	
b.	U.S. Army	X	
c.	U.S. Navy	X	
d.	U.S. Air Force	X	
e.	Quarantine Officials	X	
f.	Immigration Officials	X	
g.	A.B.S. Officials		X

18. LST BEACHING AREAS (NOT WELL ESTABLISHED)

a. Geographical Location: BAREN KO Lat. 26-10-05N Long. 127-47-04E
b. Beach
c. No deadmen or bollards.
d. Number of LST's accomodated 10.
e. No dry ramp landing.
f. One tug available for assistance.
g. No special hazards or limitations.

19. GENERAL INFORMATION

a. Ships are allowed in Buckner Bay with AMMO on board.
b. Largest ship accomodated: L-712'; W-80'; D-32'
c. This is a "first port of entry".
d. Local plans and charts are available.
e. A small boat landing is located approximately 600 yards southeast from BRAVO PIER, within the Navy boat basin.
f. Both officer and enlisted men have separate clubs located near the boat landing.
g. Recreation tours may be arranged locally. Roads on the island are good.
h. Daylight entry is preferred; night entry emergency only.

CHIMU-WAN, OKINAWA

Lat. 26-24N Long. 127-52E

1. GENERAL DESCRIPTION

Chimu-Wan, an exposed bay located just north of Buckner Bay, is used by the U.S. FORCES primarily for the discharge of clean POL products. LSTs have beached on the northern shores, but the beaching areas are considered to be fair-weather berths only due to southern exposure and hidden coral reefs. Careful checking should be done prior to use by LSTs.

2. REFERENCE CHART

a. H.O. 6131

3. PILOTS

a. Pilots are available and compulsory.
b. Pilot pick-up point - Lat. 26-25N; Long. 125-00E.
c. Daylight entrance only, night entrance emergency only.

4. TUGS AND LIGHTERS

a. Tugs: Available from NAHA.
b. Lighters: Available from NAHA.

5. COMMUNICATIONS

a. Radio call - "ALFA DELTA DELTA TWO", 500 kcs to establish a working frequency.
b. Times guarded: 24 hours.

6. NAVIGATION

a. Channel depth (LLW): 40'
b. Channel width: 2690'
c. Harbor depth: 42'
d. Tidal range: Springs 5.4' Neaps 2'
e. Navigational comments: Entrance should be made during daylight hours, except under emergency conditions.

7. ANCHORAGE CAPACITY

a. Chimu-Wan affords safe anchorage, except during southerly winds. Vessels with local knowledge anchor in 14 fathoms of water with mud bottom, off its northern shore. It has anchorage capacity for more than 30 large vessels.

8. QUARANTINE ANCHORAGE

a. Same as pilot pick-up point: Lat. 26-25N; Long. 125-00E

9. AMMUNITION ANCHORAGE

a. None

10. MOORING BUOYS

a. Capacity: One T-2 or one T-5 tanker.
b. Type: Two mooring buoys (Quick release).
c. Water depth: 40 feet wire dragged.
d. Location: Stern port and starboard.

11. BUNKERING FACILITIES

a. None. (Bunkers at Buckner Bay or Naha)

12. POTABLE WATER

a. None. (Available at Buckner Bay BRAVO PIER)
b. Cost: $0.15/military; $0.50/commercial

13. PIERS

a. None

14. POL FACILITIES

a. Depth alongside buoy 39'
b. No length limit but draft limited to 37'
c. Two 14" pipe lines (submarine) connected to two 12" hoses
d. Discharge @ 5000 BBL/HR for AVGAS, DFM, and JP4.
e. Army installation
f. Military tugs only
g. Storage capacity; 910M BBLS(JP4); 90M (AVGAS); 100M (DFM)
h. Daylight berthing only
i. No facilities available for discharge of sludge or ballast.
j. General: Chimu-Wan anchorage is an exclusive POL discharge and load facility. T-2 or T-5 tankers are moored to two mooring buoys utilizing both anchors forward. Transfer of JP-4, AVGAS and DFM are through two 4" submarine pipe lines via 10" hoses to the tank area, approximately 1½ miles from the terminal. A booster station at shoreside enables a pumping rate of 5000 BPH.

A USATG LCM is available to assist in mooring tankers and as a liberty launch for the crew.

15. HANDLING EQUIPMENT

a. None (All equipment is trucked from Naha)

16. SHIPYARDS AND DRYDOCKS

a. One 350 ton Marine railway at Naha.

17. OFFICIALS AVAILABLE

	YES	NO
a. U.S. Consul	*X	
b. U.S. Army	X	
c. U.S. Navy	*X	
d. Quarantine Officials	X	
e. Immigration Officials	X	
f. A.B.S. Officials		X

* Authorities at Naha

18. LST BEACHING AREAS

a. LST beaching area North of anchorage at KIM Beach; not feasible for cargo operations. Used as landing beach for exercise purposes by USMC.

19. GENERAL INFORMATION

a. Chimu-Wan is a POL port only.
b. U.S. Army port regs. and POL SOP regulations pertain.
c. The approach channel is buoyed and has been wire dragged to 40 feet.
d. Ammunition carrying ships are not allowed in Chimu-Wan.
e. Chimu-Wan is limited to daylight arrivals; however, pilots will take ships out at any time, provided the pilot feels it is safe to do so.
f. The pilots have no objections to berthing T-5 and super tankers, provided they are trimmed with deepest draft 39 ft. or less.
g. There is an unpaved road leading from the small boat basin to highway 24 and all points.
h. Local charts are available.
i. Chimu-Wan is a first port of entry.

NAHA, OKINAWA

Lat. 26-12N Long. 127-40E

1. GENERAL DESCRIPTION

The island of Okinawa, which is 67 miles in length, varies from 3 to 20 miles in width, with a terrain varying greatly between north and south. Naha is Okinawa's major port and capital of the Ryukyuan Island chain.

The Islands have a sub-tropical marine climate, due to the influence of the Japan Current which ranges from 5 to 15 degrees warmer than the ocean water about it. The average annual moisture content of the air is extremely high, averaging 76%. The mean annual rainfall at Naha is 84.4 inches.

2. REFERENCE CHART

a. H.O. 1912

3. PILOTS

a. Pilots are available and compulsory.
b. Pilot pick-up point - Lat. 26-13-49N Long. 127-38-11E
c. Pilots are available regularly during the day but only in emergencies at night.

4. TUGS AND LIGHTERS

a. There are 5 tugs: 3-1530 HP each
2-1200 HP each
b. Lighters: 1BC-465 Tons
1BC-4160 Tons
5 LCMs and 3 LCUs

5. COMMUNICATIONS

a. Radio call sign - "ALFA DELTA DELTA THREE", 2670 kcs (CW/Voice)
b. Voice call sign - "ALFA DELTA DELTA THREE", 2330 kcs (Voice)
c. Times guarded - 24 hours

6. NAVIGATION

a. Channel Depth: 31'6" MLW
b. Channel Width: 250' narrowest point and 500' at widest point
c. Harbor Depth: 32' (MLW)
d. Tidal Range: Springs 5.6' Neaps 2.25'
e. Channel buoys are lighted.

7. ANCHORAGE CAPACITY

About 6 large type vessels can anchor just outside of Naha and Tomari Port. Holding ground is fair. There is no anchorage area within either of the ports proper.

8. QUARANTINE ANCHORAGE

a. Quarantine anchorage "A" (Large Vessels) Lat. 26-14N
Long. 127-39E

b. Quarantine anchorage "B" (Small Vessels) Lat. 26-13.5N
Long. 127-40E

9. AMMUNITION ANCHORAGE

a. Lat. 26-13-49N Long. 127-38-11E

10. MOORING BUOYS

a. None

11. BUNKERING FACILITIES

a. Barge YO487-9000 bbls; BG-4160 bbls
b. Alongside. B#1, DFM; B#G, NSFO B#F-NSFO
c. Government cost $2.436/bbl
d. Pumping capacity alongside: 2500BBLS/HR
Pumping capacity by barge: 4000BBLS/HR

12. POTABLE WATER

a. Potable water is available at all berths but not by barge.
b. Cost: Government - $0.15/ton
Commercial - $0.50/ton
c. Pumping capacity: 50 ton/hr

13. PIERS

a. General Cargo

Berths	1	2	3	4	5	6	7	8	9	10
Length	575'	500'	500'	500'	500'	500'	500'	200'		500'

Berth #9 not utilized.
Width Extensive, except at B#3 and B#5, which have warehouses and aprons approx. 20' wide.
Depth 32' all berths except B#9-14' and B#10-18'
Ht. of deck above MLW-8'

There is fixed lighting at all berths and LST beach.
There are no rails on the piers.
Potable water is available but in limited quantity during the summer.

b. Naha Commercial Berths - FOXTROT - 650'L; Draft - 25' LLW
GOLF - 640'L; Draft - 31' LLW (NSFO)
HOTEL - 580'L; Draft - 31' LLW
INDIA - 225'L; Draft - 30' LLW

14. POL FACILITIES

B#1 and B#G are the POL piers.
Depth alongside B#1 32' B#G 31'
The limits of the berth are the only limiting factors in the size of vessel which can be accomodated.
Pipe lines and sized B#1: 8" (1) line; B#G (1) 8" and (1) 6"
Loading and Discharge rates for each product: NSFO-3500BPH
DFM -3000BPH
(Loading & Discharging)
Type Installation: NSFO-commercial CALTEX lines to USAQMPOL Tank Farm
DFM-USAQMPOL facilities
Military (USA) tugs available for docking
Storage capacity NSFO: 2 tanks 80M 160M bbls bot tank farm
DFM: 5 tanks 10M 50M bbls Naha tank farm #1 & #2
Daylight berthing only.
No facilities available for discharge of ballast or sludge.
All discharge of POL berthside and to YO and BG by arrangement.
72 hr notice is desired.
Reefer cargo discharged and loaded at B#3 and B#5 due to warehousing.

15. HANDLING EQUIPMENT

a. Cranes - 4-40 tons crawler
1-65 ton crawler
1-45 ton crawler
3-12 ton truck mounted cranes

b. Floating Cranes
2-100 ton cranes
Capacity: 90LT 80' above water level
75LT 104'6" above water level
15LT 122'6" above water level

c. Fork lifts
31-6000 lb (gas)
13-15000 lb (gas)
4-4000 lb (elec)

16. SHIPYARDS AND DRYDOCKS

Drydocks and repair facilities are limited to one small marine railway capable of handling only small craft up to 350 tons.

17. OFFICIALS AVAILABLE

		YES	NO
a.	U.S. Army	X	
b.	U.S. Consul	X	
c.	U.S. Navy	X	
d.	Quarantine Officials	X	
e.	Immigration Officials	X	
f.	A.B.S. Officials		X

18. LST BEACHING AREAS

a. Located at the eastern end of the port.
b. Beach area with padeyes imbedded in concrete ramp.
c. Five LSTs can be accomodated.
d. Tugs are available for assistance.

19. GENERAL INFORMATION

a. The largest ship to enter port was 600' long, 85' wide and with a draft of 32'.
b. Except for No. class 1 Ammunition ships carrying ammunition are not allowed in port.
c. The geographical location for the ammunition discharge berth is 25-13-49N, 127-38-11E.
d. Special port and harbor regulations can be found in USARYIS/IX CORPS PORT REGULATIONS and are available from the harbor master.
e. There is a direct connection from the port to main four lane highway #1.

HUALIEN, TAIWAN

Lat. 23-58-29N Long. 121-56-31E

1. GENERAL DESCRIPTION

The port of Hualien, Taiwan is situated at about the midpoint on the eastern coast of Taiwan, approximately 94 miles from Keelung (the principal port) and 150 road miles from the Capital City of Taipei. The harbor was first built by the Japanese in 1931. Improvements were made to the harbor over the years with the last major expenditure for construction by the Japanese taking place in 1940. During World War II the port of Hualien was seriously damaged by allied bombing. In 1949 the Chinese government commenced restoring the harbor to it's pre-war condition. Plans were subsequently drawn up for the expansion of the port in four stages. The first stage - widening of the approach channel, dredging, construction of new piers, and a turning basin - was commenced in April 1959 and completed in October 1962. The port can now handle ships of the 10,000 ton class. Principal exports through the port are cement, fertilizers, sugar, logs, and pineapples. Cargo handled at the port has increased from a total of 100 thousand measurement tons in 1949 to about 300 thousand tons in 1962.

Hualien has a population of about 60,000 people, about 10,000 of which are Chinese and the remainder native Taiwanese. Roads and railroads to and from Hualien are extremely limited. Air service is available at the new Hualien Airport. The port was officially opened as an international port in September 1963.

2. REFERENCE CHART

a. H.O. chart No. 6121 and 6122

3. PILOTS

a. One pilot is available.
b. Pilotage is compulsory for ships of 1,000 gross tons or more.
c. Pilot pick-up point is outside channel entrance.

4. TUGS AND LIGHTERS

a. Tugs: one 140 HP
one 200 HP
one 400 HP
b. Lighters: none available

5. COMMUNICATIONS

a. There are no U.S. communication facilities at Hualien.
b. A Harbor Entrance Control Post (Chinese Navy) is situated at the west side of the entrance to the port. International signals are used for controlled entry and exit.

6. NAVIGATION

a. Channel depth: Controlled depth in the man-made channel is now 23'; however, dredging operations are underway to increase the depth to 30'.
b. Channel width: 300' at the surface and 230' at the bottom.
c. Harbor depth: Same as the channel depth; however, berths 5 and 6 have been dredged to a depth of 30'.
d. Tidal range: Springs 5½' Neaps 4½'
e. Navigational comments:
(1) Wind and current: There are no significant currents in the channel entrance or harbor. Currents up to 2.2 knots may be experienced about 500 yards outside the channel entrance. Ships may be affected by winds upon entering the channel.
(2) Range: Ships entering the harbor enter on a range as indicated on the H.O. charts. Course on range is 024° True.

7. ANCHORAGE CAPACITY

a. There is no anchorage area in the port proper. Ships may anchor outside of the harbor entrance if necessary. Outside anchorage area is unlimited.

8. QUARANTINE ANCHORAGE

a. There is no assigned quarantine anchorage, but quarantine officials will board the ship on arrival outside the channel entrance.

9. AMMUNITION ANCHORAGE

a. No information available.

10. MOORING BUOYS

a. None

11. BUNKERING FACILITIES

a. Diesel oil, gasoline, kerosene, and black oil are available. The Chinese Petroleum Corporation maintains a small tank farm with total capacity of 2,250 ton in the vicinity of the piers. Four 6" fueling outlets are available at berths 4 and 5. Supply from the tanks to the ship is by gravity flow.

12. POTABLE WATER

a. Fourteen 2.5" water valves are installed along the piers.
b. Cost: $0.325 per ton for commercial ships and $0.0875 per ton for military ships.

13. PIERS

a. General Cargo

Name or number	1	2	3	4	5	6
Length Alongside	340'	340'	340'	340'	525'	525'
Width - (feet)	40'	40'	40'	40'	60'	60'
Alongside depth	23'	23'	23'	23'	30'	30'
Lights on Pier	Yes on all piers					
Rail facilities	Yes at all piers					
Potable water available	Yes on all piers					
Bunkers	No	No	No	Yes	Yes	No

14. POL FACILITIES

a. None

15. HEAVY LIFT EQUIPMENT

a. Cranes

No.	Type	Max. Lift	Max. Wt. Lift
1	*Fixed	30'	40 tons
3	Moveable	30'	3 tons
1	Moveable	35'	5 tons

* Located at Berth #4 - working radius is 180°

b. Floating Cranes

Type	Safe Lift Capacity	Max. Vert. Lift
Crawler crane on barge	5 tons	35'

16. SHIPYARDS AND DRYDOCKS

a. One marine railway for craft up to 500 tons.
b. A 40-man repair force can provide minor ship repairs.

17. OFFICIALS

	YES	NO
a. U.S. Consul		X
b. U.S. Army		X
c. U.S. Navy		X
d. Quarantine Officials	X	
e. Immigration Officials	X	
f. A.B.S. Officials		X
g. U.S. Air Force	X	

18. LST BEACHING AREAS

a. LST's are berthed at a pier alongside the marine railway. Water depth at the pier is 10' forward, 16.5' aft.

b. There are no LST beaching areas under the control of the harbor officials.

19. GENERAL INFORMATION

a. Hualien is a daylight port. Ships may enter and leave from sunrise to sunset. Departures up to 2100 local time can be arranged.

b. Capacity of the port: Two 10,000 ton ships, four 3,000 ton ships, and six 500 ton ships plus numerous smaller vessels and fishing craft can be handled in the port at the same time.

c. The harbor is exposed to strong monsoons and typhoons.

d. Hualien is 150 miles (7 hours) by car and 40 min. by air from Taipei. The city and port of Hualien is served by but few access roads and but one narrow guage railroad. Present land transportation serving the port is such as to preclude any large scale use of the port for years to come.

KAOHSIUNG, TAIWAN

Lat. 22-31N Long. 120-15E

1. GENERAL DESCRIPTION

In 1900 when Taiwan (Formosa) was under the Japanese control, plans were formulated for the development of Kaohsiung's harbor facilities. Large-scale construction began in 1908 and by 1920 Kaohsiung became one of the two most important and the largest harbors on the island. During World War II, this harbor was used as the main naval and supply base by the Japanese for staging their advances to the southwest, consequently, it was one of the key targets for the allied bombers and as a result the city suffered heavy destruction. Following V-J Day, reconstruction work was pushed and by April 1952 reconstruction was completed. In Tsoying, five miles north of Kaohsiung, are located the headquarters of the Chinese Nationalist Navy and Marine Corps including the Chinese Nationalist Amphibious Base established under American supervision.

The city of Kaohsiung is situated at the southern part of Taiwan, 325 miles east of Hong Kong and 552 miles north of Manila. Practically all of the 8,000,000 people living on Taiwan are of Chinese decent. The majority of the people speak Taiwanese (Fukien dialect of Chinese) and consider themselves as Taiwanese, not Chinese.

2. REFERENCE CHART

a. H.O. No. 6127

3. PILOTS

a. 5 licensed pilots are available.
b. Pilots are compulsory for ships over 500 gross tons.
c. Pilot pick-up point is outside outer breakwater.
d. Pilots are normally available for entrance until sunset and for exit until 2100. Otherwise upon special request.

4. TUGS AND LIGHTERS

a. Tugs: Five tugs 600 HP to 1,000 HP
b. Lighters: Eight 100 L/T (Steel)
Twenty-five 30-80 L/T (Wood)

5. COMMUNICATIONS

a. Voice call sign is MSTS KAOHSIUNG, 2716 KCS
b. Harbor entrance control point is located at Lat. 22-37-15N Long. 120-15-33E.

6. NAVIGATION

a. Channel depth: Outer harbor 37.72'
Inner harbor 36.08'
b. Tidal range: Springs 1.8' Neaps 1.2'

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c. Navigational comments:

(1) A submarine net is established at the breakwater and is normally closed from 2200 until 0330; however, this time is subject to change.

(2) At last report the maximum draft permissable to enter Kaohsiung was 34'.

7. ANCHORAGE CAPACITY

a. Outside breakwater: unlimited
b. Inside breakwater: 15 free swinging mooring buoys

8. QUARANTINE ANCHORAGE

a. Outside outer breakwater

9. AMMUNITION ANCHORAGE

a. None

10. MOORING BUOYS

a. 15 mooring buoys are available with 3000 to 10,000 ton capacity.
b. Type: cylinderical, free swinging
c. Depth of water: 20' to 30'

11. BUNKERING FACILITIES

a. By barge: 500 tons at any berth, if more than 500 tons required at least one week advance notice.
b. Alongside: Available only at tanker piers 17, 18 and 19.

12. POTABLE WATER

a. Available only by barge.
b. Water is considered fresh but not potable without treatment.

13. PIERS

Name or Number	4	5	6	7	8	9	10*	15	16
Length alongside	492'	492'	492'	492'	492'	461'	492'	492'	590'
Capacity (gross ton)	3000	6000	8000	10000	10000	8000	20000	10000	10000
Alongside depth	25.26'	25.26'	25.58'	26.57'	24.5'	24.27'	29.19'	29.52'	29.5'
Ht. of deck above MLW (Feet)	6'	6'	6'	6'	6'	6'	6'	6'	6'
Lights on pier	All piers Yes								
Rails on pier	All piers Yes								
Potable water available	All piers No								
Bunkers	All piers yes								

* Pier #10 is normally the only pier used for discharging and loading explosives.

14. POL FACILITIES

a. General information: Terminal facilities located at Kaohsiung are limited in pier space, storage capacities, pipe lines, and pumping capacities. Piers 17, 18 and 19 are the only piers equipped to handle bulk petroleum. Tank spaces allocated to military use are extremely limited and are inadequate for cargoes exceeding 35000 bbls. As Kaohsiung is a daylight port, any vessel arriving with a cargo of 35000 bbls or greater will be in port at least one overnight. For T-2 or Mission type tankers, discharge time is roughly 36-48 hours.

b. The following is a breakdown of PRODUCTS AVAILABLE and the NO. AND SIZE LINE at each POL Pier:

Pier #17 - Fuel oil, diesel, jet, avGas, 1-8" line each
Pier #18 - JP4, premium gas, regular gas, avGas 100/300, crude oil, NSFO, 1-8" line each. Diesel, fuel oil, 1-4" line each
Pier #19 - JP4, premium gas, regular gas, diesel, NSFO, 1-8" line each. Fuel oil, 1-4" line.

15. HANDLING EQUIPMENT

a. Cranes are old but satisfactory. No conveyor crane available.. The heaviest shore base crane is stationary and located at pier #7 with a capacity of 40 L/T.

b. Floating cranes:

Type	Safe Lift Capacity	Max. Vert. Lift
Rotating	36 L/T	73'
Rotating	12 L/T	55'

16. SHIPYARDS AND DRYDOCKS

a. No shipyard available.
b. A 3000 ton drydock has been built recently.

17. OFFICIALS

		YES	NO
a.	U.S. Consul		X
b.	U.S. Army	X	
c.	U.S. Navy	X	
d.	Quarantine Officials	X	
e.	Immigration Officials	X	
f.	A.B.S. Officials		X

* With advance notice A.B.S. Rep can come down from Keelung.

18. LST BEACHING AREAS

a. Located north of pier #13. The LST area has a beach with 4 deadmen and bollards available. It accommodates 2 LSTs simultaneously.

b. Dry ramp landing is available.

19. GENERAL INFORMATION

a. The (L) (W) (D) of the largest ship to be accommodated at this port was 600' X 100' X 34'

b. Ships carrying ammunition may enter this port.

c. This is a "First Port of Entry".

d. There is no U.S. Government Supply Facility available.

e. A small U. S. military dispensary is available for emergency services.

KEELUNG, TAIWAN

Lat. 25-10N Long. 121-45E

1. GENERAL DESCRIPTION

In 1626 the Spaniards arrived at Keelung from Luzon, Philippine Islands and established the city. Sixteen years later the Dutch, who dwelled in the southern part of Formosa Island, drove out the Spaniards and occupied the city. In 1660, Djen Chen-kung of the Ming Dynasty of China drove the Dutch out and conquered the whole island. Thereafter the city was known as "Keelung". Following the conquest of the island by General Cheng, Chen-kung in 1663, it was decided that this port should be developed in view of its good geographical position and the rich reserves of coal and gold mines in the vicinity. At that time, only small boats could come in at low tide while the larger ships had to anchor a few miles off-shore which was inconvenient both for passengers and cargo handling. About 160 years later the island was turned over to the Ching Dynasty. Since that time, many Chinese people have come from the China mainland to make their homes in Keelung and other parts of this island.

In 1863 both Keelung and Kaoshiung (on the southwest coast) were opened to world trade.

2. REFERENCE CHART

a. H.O. No. 1908

3. PILOTS

a. 5 licensed pilots are available, and a pilot is required for vessels over 500 G/T.

b. Pilot pick-up point is outside the outer breakwater at Lat. 25-09-41N Long. 121-44-50E.

c. Pilots are available day and night; however, ships normally may enter and depart only during daylight hours.

4. TUGS AND LIGHTERS

a. Tugs: five 200 HP to 1500 HP

b. Lighters: 39 wood 65 L/T
14 wood 65 L/T coal barges
1 steel 300 L/T

5. COMMUNICATIONS

a. Voice call sign "MSTS KEELUNG", on 2716 KCS.

b. Times guarded: one hour prior to ETA of USNS ship's.

c. Chinese "PORT CIRCUIT" is 2150 KCS on a 24 hour basis. English speaking personnel will be called to the radio if a US ship attempts to use this circuit.

6. NAVIGATION

a. Channel depth: Outer harbor 32' to 60'; Inner harbor 32'
b. Channel width: 300 yds
c. Harbor depth(LLW): 5 to 6 fathoms
d. Tidal range: Springs 2.5' Neaps 1'
e. Navigational comments:
(1) A depth of 4.5 fathoms exists 770 yds bearing 042.5° from the light (flashing red) at Lat. 25-08-50N; Long. 121-44-45E.
(2) A light house has been established on the summit of Chintzu Shan (Lat. 25-08-52N; Long. 121-44-07E). This lighthouse forms a range with Banjintai Di light, range bearing 202° T to provide safe passage between Keeling Island and the rocks located about 2 miles westward.
(3) The buoys which marked the wreck at Lat. 25-09-01N, Long. 121-45-02E have been removed. Mariners are warned to proceed with caution when anchoring in this area, as the wreck is still on the bottom.
(4) The breakwater entrance is approximately 528' wide, severe cross currents may be expected, particularly during the periods of maximum ebb and flood tides or during unusual wind conditions - care should be exercised.

7. ANCHORAGE CAPACITY

a. Outer harbor: 3 large type vessels
b. Inner harbor: 2 large type vessels

8. QUARANTINE ANCHORAGE

a. Deep draft: Outer harbor west fairway.
b. Shallow draft: Outer harbor east fairway.

9. AMMUNITION ANCHORAGE

a. Same as quarantine anchorage.

10. MOORING BUOYS

a. Inner harbor:

Buoy No.	Draft	Size (G/T)
1	Up to 30'	6,000 - 20,000
2	Up to 30'	6,000 - 20,000
3	Up to 30'	6,000 - 20,000

11. BUNKERING FACILITIES

a. Small size tankers (400 tons) are available from the Chinese Petroleum Corporation.
b. Oil pipelines are laid to berths at piers 6, 12, 14 and 30.
c. All petroleum products are commercial grade and supplied by the Chinese Petroleum Corporation.
d. Generally, vessels will take on bunkers in Keelung only under emergency requirements.

12. POTABLE WATER

a. Water is available by barge and/or alongside.
b. Amounts up to 150 tons are normally provided free of charge; the cost of water is normally 13 NT$ per S/T if the amount required exceeds 150 tons.
c. All water must be chlorinated at no less than five parts per million, and allowed to stand for not less than twelve hours before using.

13. PIERS

Name or Number	2	3	4	14	15	16	17	18	30
Length Alongside	670'	602'	550'	586'	480'	510'	688'	715'	580'
Width (feet)	All piers 48'								
Alongside depth	28'	26'	30'	30'	29'	29'	30'	30'	33'
Ht. of deck above MLW (feet)	10'	10'	10'	8.5'	8.5'	8.5'	8.5'	8.5'	10'
Lights on pier	no	no	no	no	no	no	no	no	yes
Rails on pier	All piers yes								
Potable water available	All piers yes								
Bunkers	no	no	no	no	no	no	no	no	yes
Ammunition discharge or load	no	no	no	no	no	no	yes	no	no

14. POL FACILITIES

a. Pier #13 with a depth alongside of 27' and length of 33' is reserved for Chinese military ships and barges; however, a tanker can moor to pier 12 (depth alongside of 25' and length of 738') and discharge to petroleum lines at pier 13. There are two 6" lines (one black and one clean).

b. Pier #30 is used for discharge of DOD sponsored POL cargoes and has one flexible line fuel connection for a ship-to-shore tie-in. A booster pump station is located approximately 2,000 feet from the pier connection. There are five 6" two-stage centrifugal pumping units each powered by a 602 continental engine. The maximum working pressure to which the pumps may be subjected is 700 psi or 2,230 feet of head. The booster station requires a 30 psi suction pressure for normal operation. The pumping rate is normally 2,000 barrels per hours. Four pumps are utilized with one standby for normal unloading procedures. All pier connections, tank gauging and flexible hose, etc., are furnished by the Chinese Air Force.

15. HANDLING EQUIPMENT

Equipment	Number	Location	Capacity
Floating Cranes	2		130 L/T (Non-rotating) and 65 L/T (lift 45' to 82' respectively)
Stationary Cranes	2	Pier 2	3 ton electric

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Equipment	Number	Location	Capacity
Stationary Cranes	2	Pier 3	3 ton electric
Stationary Cranes	1	Pier 4	25 ton electric
Stationary Cranes	2	Pier 14	3 ton electric
Stationary Cranes	2	Pier 15	3 ton electric
Stationary Cranes	2	Pier 16	3 ton electric
Stationary Cranes	2	Pier 17	3 ton electric
Stationary Cranes	2	Pier 18	3 ton electric
Mobile Cranes	6		5 to 10 ton
Fork Lifts	24		1 to 5 ton

16. SHIPYARDS AND DRYDOCKS

a. The Taiwan Shipbuilding Corporation, a Chinese government-owned shipyard, is located in Keelung and is a well-equipped repair and shipbuilding yard. Two dry docks are available:

	#1	#2
Length	700'	540'
Width at entrance	80'	60'
Depth over sill (low water)	25'	18'

Machine shop and facbrication facilities are in full operation. Electric and electronics shops are limited by requirements for new construction ships at the yard. There are several marine railways and repair yards in the Keelung harbor for small craft up to 300 tons.

17. OFFICIALS

	YES	NO
a. U.S. Consul		X
b. U.S. Army		X
c. U.S. Navy	X	
d. Quarantine Officials	X	
e. Immigration Officials	X	
f. A.B.S. Officials	X	

18. LST BEACHING AREAS

a. LST's are worked alongside piers; ramp discharge is possible but not practiced.

19. GENERAL INFORMATION

a. The harbor entrance is controlled by special signals.

b. The largest ship to enter Keelung was the S.S. STATENDAM with a length of 642' and draft of 26'.

c. Ships may enter port carrying ammunition.

d. This port is daylight entry only.

e. This is a first port entry.

f. There is no U.S. government supply facility available in the Keelung area.

g. There are no U.S. military medical facilities in Keelung; however, a large civilian hospital is available for emergency treatment.

MANILA, P. I.

Lat. 14-35N Long. 120-58E

1. GENERAL DESCRIPTION

Manila is located on both sides of the Pasig River, on the eastern shore of Manila Bay, about 25 miles from its entrance. It is the largest city in the Philippines. Because of its central location and adequate transportation facilities, the city serves practically the entire archipeligo as the main gateway for foreign and domestic commerce. The native products of export include sugar, copra, tobacco, coconut oil, lumber, iron ore, canned pineapple, leaf tobacco, and cordage. Imports consist chiefly of iron and steel manufactures, dairy products, automobiles, tires, coal, rice, wheat, cotton, etc.

2. REFERENCE CHARTS

a. H.O. Chart Nos. 4236, 4243, 4255

3. PILOTS

a. Pilots are available day and night.
b. Pilots are compulsory from breakwater to berth in inner harbor.
c. Pilot pick-up point - Lat. 14-33-35N Long. 120-54-10E.
d. Request for pilot service within the port area is signaled by sounding two long blasts and one short blast on the ship's whistle 30 minutes prior to departure.

4. TUGS AND LIGHTERS

a. Tugs (No. and H.P.): 9 tugs 250-300 HP and 4 tugs 350-500 HP for Manila Bay pilotage; 4 tugs 750-1400 HP for interisland towing only.
b. Lighters (No. and Capacity): 21 lighters 1000-2000 ton; 13 lighters 500-1000 ton; 93 lighters 75-500 ton.

5. COMMUNICATIONS

a. Radio call sign - "NOVEMBER SIERRA PAPA", 2836 KCS
(Guarded only on request)
b. Voice call sign "SANGLEY CONTROL", ~~2712~~ 2350 KCS
(Guarded continuously)

6. NAVIGATION

a. Channel Depth (LLW) - 30.5' at mouth of South Harbor inner breakwater.
b. Channel Width - 600' at mouth of South Harbor inner breakwater.
c. Harbor Depth (Min.) - Inner harbor 12' to 35'
Outer harbor 40' to 50'
d. Tidal Range - Springs 3.3' Neaps 3.0'

e. Navigational Comments:

(1) Channel is clear but there are several sunken ships and other obstructions in harbor.

(2) Navigational aids are adequate for safe navigation.

7. ANCHORAGE CAPACITY

a. Unlimited.

8. QUARANTINE ANCHORAGE

a. Location - Lat. 14-33-35N Long. 120-54-10E

9. AMMUNITION ANCHORAGE

a. None prescribed in harbor regulations.
b. Area utilized: Lat. 14-35-10N Long. 120-54-11E

10. MOORING BUOYS

a. Capacity: 1 buoy available, capacity 5 DDs in 40KT wind.
b. Type: 9'6" x 5' USN bar type class E
c. Water depth: 20'
d. Location: anchorage 21, inner harbor

11. BUNKERING FACILITIES

a. 17 barges with capacities from 1000 to 6000 bbls are available.

b. No bunkering facilities available alongside.

c. Class or Type - NSFO under DPSC contract. DFM at Sangley Point from Navy stocks.

d. Cost per bbl. - NSFO (Contract) $15.00 per long ton, (includes delivery). DFM $0.087 per gallon.

e. Pumping capacity of barges is approximately 720 bbls/hour.

12. POTABLE WATER

a. Two 400 ton barges; two 150 ton barges are available. Pumping capacity is 15 to 20 tons/hour.

b. Available at all piers in South Harbor. Pressure is often inadequate.

c. Minimum charge $50.00 for 60 L/T plus $0.75 for each additional ton.

13. PIERS

Pier Number	3	5	7	9	13
Length alongside (feet)	480'	1180'	440'	950'	1300'
Width (feet)	80'	100'	80'	303'	230'
Alongside depth (feet) (N-North; S-South)	N. S.	N. S.	N. S.	N. S.	N. S.
(inner harbor)	18'24'	22'20'	24'24'	22'22'	24'24'
(outer harbor)	25'29'	31'30'	34'34'	32'32'	30'30'

Height of deck above MLW (feet)	10'	10'	10'	16'	10'
Lights on Pier	yes	yes	yes	yes	yes
Rails on Pier	no	no	no	no	no
Potable water available	yes	yes	yes	yes	yes
Bunkers	yes	yes	yes	yes	no

14. POL FACILITIES

None in Manila. See Bataan section.

15. HANDLING EQUIPMENT

a. General summary of pier cranes, conveyors, etc.:
(1) 2 gantry cranes with 5 LTON lift; one each piers 9 & 13.
(2) No conveyors available.
b. Capacity of heaviest short based crane and location:
(1) Vertical lift, P&H crawler crane; 20 L/T capacity, owner - Luson Stevedoring Company.
c. Floating cranes

TYPE	SAFE LIFT CAP. (T)	MAX HT OF LIFT ABOVE WATER LEVEL	MAX VERT. LIFT	REMARKS(OWNER)
1 Gooseneck	20 L/T	50 ft.	20 L/T	Luzon Stevedoring Co.
1 Single Boom	25 L/T	40 ft.	15 L/T	Luzon Stevedoring Co.
1 Floating (steam)	80 L/T	70 ft.	80 L/T	Luzon Stevedoring Co.
1 Yard (floating)	100 L/T	130½ ft.	90 L/T	USN (Sangley Point)

16. SHIPYARDS AND DRYDOCKS

a. National Shipyard at Mariveles Harbor, Bataan.
Length of Drydock - 550'
Width at entrance - 100'
Depth over sill - 29'
Minor repair facilities available through Philippine Engineering Co.
b. Subic Bay Naval Station capable of major repairs.

17. OFFICIALS

	YES	NO	
a. U.S. Consul	X		
b. U.S. Army	X		
c. U.S. Navy	X		Navy Officials, except MSTS and USNA, at Sangley Point
d. Quarantine Officials	X		
e. Immigration Officials	X		
f. A.B.S. Officials	X		
g. U.S. Air Force	* X		

* Air Force located at Clark AFB and Bataan POL Depot. AF Port Veterinarian attaches, and A/C overhaul contract unit located at Manila.

18. LST BEACHING AREAS

a. Concrete beaching ramp located between piers 3 and 5, inner harbor.
b. Accomodation for one LST.
c. Bollards are available, tugs are available to assist.
* d. Philippine Navy LST's have first priority.

19. GENERAL INFORMATION

a. The (L)(W)(D) of the largest ship to be accommodated this port was 800' X 90' X 30'
b. Ships carrying mixed cargo including ammunition must discharge ammo at the anchorage. They are not allowed to enter the inner harbor with other than small arms ammunition (CG Class I) aboard.
c. Manila is a "first port of entry" and is a 24 hour port.
d. Ships anchoring in the harbor use two anchors.
e. Quarantine, customs, and immigration services are available on a 24 hour basis. Normal working hours are 0800 to 1700, and all services rendered before or after these hours are billed at overtime rates. Philippine officials desire 24 hour advance notice, if possible, of all services required. Quarantine official normally boards at the quarantine anchorage, however, in bad weather ships will be notified to enter the breakwater for boarding by quarantine officials. Customs and immigration officials normally board at the ultimate berth. Officials prefer an accommodation ladder to a jacobs ladder for boarding.
f. Narrow two lane roads and a single track rail line leads from the port area to other points on Luzon. (Rails terminate in North Harbor).

SUBIC BAY, PHILIPPINES

Lat. 14-46N Long. 120-13E

1. GENERAL DESCRIPTION

Subic Bay is located on the western coast of Luzon approximately fifty miles north on the entrance of Manila Bay. Subic is readily available from the China Sea, through a deep water channel to a minimum depth of seven fathoms along Alava Dock. The channel itself averages twenty fathoms in depth. With the exception of the typhoon season itself, adverse winds and currents will not normally be encountered by ships using this harbor.

2. REFERENCE CHARTS

a. H.O. Chart No. 2088

3. PILOTS

a. Pilots are available day and night.
b. Pilots are compulsory for all ships except DL's and smaller USS ships.
c. Pilot pick-up point - Lat. 14-48N Long. 120-14E, in main channel between Grande Island and midchannel buoy.

4. TUGS AND LIGHTERS

a. Tugs: two 600 HP, two 1000 HP, and four 1200 HP
b. Lighters: one 480 ton, one 2460 ton, and four 590 ton (480 ton only lighter available for general cargo, 2460 ton for aircraft, and 590 ton for ammunition)

5. COMMUNICATIONS

a. Radio call sign "NOVEMBER PAPA OSCAR" on 2836 KCS
b. Voice call sign: (1) "TUG CONTROL" on 3160 KCS
(2) "SUBIC CONTROL" on ~~2712~~ 2350 KCS
c. Voice circuits are guarded continuously. 2836 KCS(CW) only when "SUBIC CONTROL" directs. 3160 KCS (voice) must be guarded by all ships when underway within the harbor.

6. NAVIGATION

a. Channel Depth (LLW) - 14 to 30 fathoms.
b. Channel Width - Main channel is 800 yds. Camayan Pt. channel is 300 yds.
c. Harbor depth - 10 fathoms except in shoal areas and alongside piers.
d. Tidal Range: Springs 5 feet Neaps 1 foot
e. Navigation comments:
(1) Channel is unobstructed, and can be navigated in foul weather with use of radar.
(2) Navigational aids are adequate. There are several shoals and wrecks in the harbor, but they are all marked on appropriate charts.

7. ANCHORAGE CAPACITY - Unlimited

8. QUARANTINE ANCHORAGE

a. Lat. 14-48-30N Long. 120-13-30E, or as designated by the Harbor Master.

9. AMMUNITION ANCHORAGE

a. Lat. 14-10N Long. 120-12-30E, or as designated by the Harbor Master.

10. MOORING BUOYS

a. Capacity: 5 DDs in 40KT wind.
b. Type: 7 riser type; 1 telephone type (buoy 19).
c. Water depth: min. 81'; max. 126'.
d. Location: see H.O. Charts 2088 and 2093.

11. BUNKERING FACILITIES

a. By barge: 1500 to 2000 bbls per hour.
b. Alongside: Six fueling stations at POL pier. 2000 to 8000 bbls per hour (function of ship's back pressure).
c. Class or type: NSFO, or DFM.
d. Government cost per bbl: NSFO $2.38 per bbl.
DFM $0.087 per gal.

12. POTABLE WATER

a. Water is available alongside and by barge.
b. Pumping capacity:
(1) Alongside using one 2½" hose - 5000 gal per hour.
(2) By barge using two 2½" hoses - 25,000 gal per hour.
c. Cost per gal or ton: $0.10 per 1,000 gal.

13. PIERS

NAME	LOCATION	DEPTH (DREDGED)	LENGTH	WIDTH	TYPE	FACILITIES*
Alava Wharf	NAVSTA Subic	40'	1700'	60'	Marginal Wharf Concrete Slab & Piles	W, T, A, S, E & PC
Layte Wharf	NAS Cubi	45'	1000'	80'	Marginal Wharf Concrete Slab & Piles	W, T, E**
Rivera Point South	Rivera Point	30'	450'	60'	Marginal Wharf Concrete Slab & Piles	W, T, A, S, E