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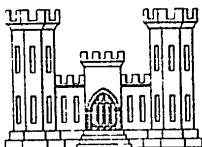
STUDY

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THE PORT OF ODESSA, USSR (U)

A TECHNICAL SERVICE INTELLIGENCE DOCUMENT

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PREPARED UNDER THE DIRECTION OF THE
CHIEF OF ENGINEERS
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C.

DECEMBER 1957

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PORT OF ODESSA, USSR

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PORT OF ODESSA, USSR

EXPLANATORY NOTES

Anchorage

Anchorage are given where appropriate in the following classes:

Class I	800-yard diameter	38-foot depth
Class II	500-yard diameter	30-foot depth
Class III	300-yard diameter	20-foot depth
Class IV	200-yard diameter	15-foot depth

Usable berthing space

Wharves with alongside depths of 5 feet or more at mean low water are the only facilities listed.

The following classification of wharf berths is used in this report:

- Class A-type - (Liberty-Victory) (C2 and C3)
Length of 460 to 500 feet with depths of 24 to 29 feet alongside.
- Class B-type - (Large coaster)
Length of 350 feet with depths of 19 to 24 feet alongside.
- Class C-type - (Standard coaster)
Length of 250 feet with depths of 16 to 19 feet alongside.
- Class D-type - (Small coaster)
Length of 200 feet with depths of 12 to 16 feet alongside.
- Lighter - Length of 100 feet with depths of 5 to 12 feet alongside.
- T-D tanker - Depths of 13 to 25 feet alongside.

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EXPLANATORY NOTES-Continued

Facilities included

Wharves known to handle general cargo, or believed to be suitable for handling general cargo, are listed as general cargo wharves. However, where there are minor facilities for handling grain, coal, or petroleum products on a general cargo wharf, the wharf is classified as a general cargo facility. When a wharf is used exclusively for fitting out, coal, grain, petroleum, repair, and other special uses, it is classified and tabulated as such.

Distances

Unless otherwise stated, distances are expressed in feet or nautical miles.

Depths of water and heights above water

Expressed in feet. In presenting navigation and construction features, depths of water and heights above water are in terms of chart datum (zero tide).

Construction details

Expressed in feet or meters. Slopes of embankments, breakwaters, etc. are expressed in the text in terms of the horizontal base to the vertical rise as 3 to 1 or 4 to 3.

Harbor areas

For less than 1 square nautical mile, areas are listed in acres. Over 850 acres, the areas are listed in terms of square nautical miles.

Covered storage space

The total area in warehouses, transit sheds, and similar structures is given in square feet of floor area. No deduction is made for aisle, fire, elevator, or other such space.

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EXPLANATORY NOTES-Continued

Place names

The latest available designation for places and areas is given. English terms for words such as wharf, bay, canal, and basin have been given preference.

Estimated military unloading capacity

The estimated military unloading capacity of a port is determined on the following basis:

One long (2,240-pound) ton of general cargo handled in a 20-hour day for each linear foot of usable general cargo wharf. However, this estimate has been reduced in some cases to compensate for local conditions which restrict cargo handling operations.

Potentialities for expansion

Description of the expansion possibilities of the port to increase the military discharge capacity. The phased program to be used as a guide for planning purposes is as follows:

Phase I - The repair, improvement, and modernization of existing facilities, including minor dredging.

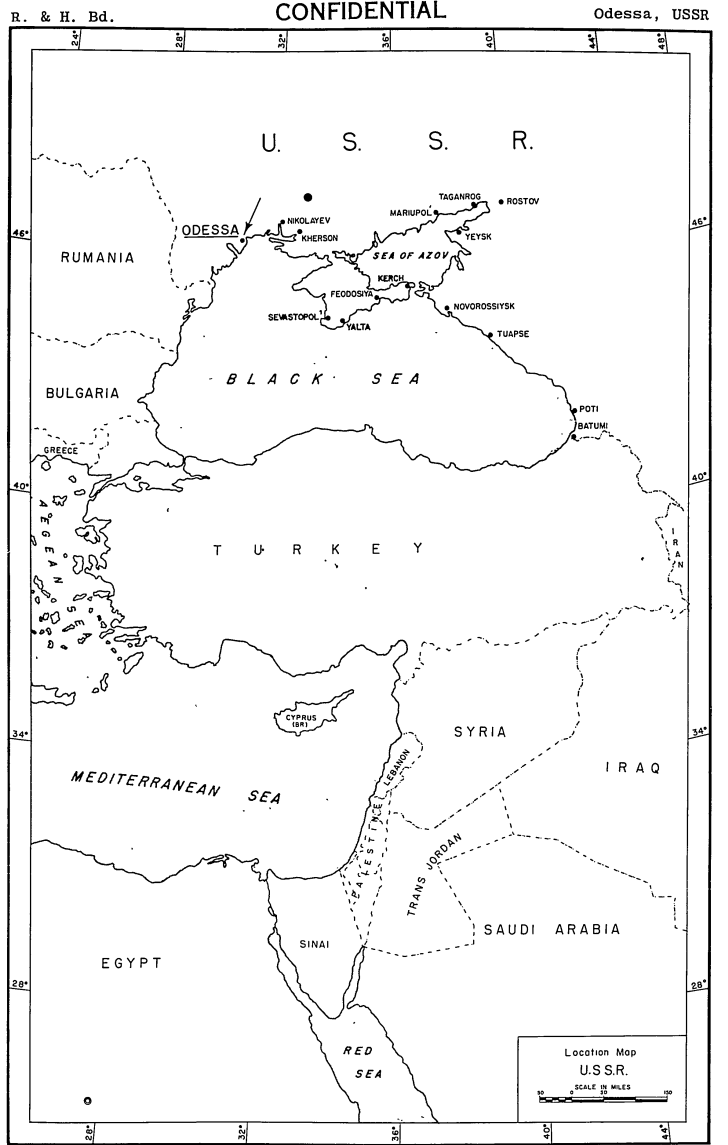
Phase II - Improvements such as the construction of additions or extensions to existing wharves or piers, including dredging requirements.

Phase III - Suggestions for the location of new piers or wharves.

Points of vulnerability

The points of vulnerability in the port are those which if rendered useless by any means, in whole or in part, would adversely affect the present and ultimate capacity of the port.

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Panoramic view of the port of Odessa looking SE.
ONI 490562, 490566, 490568 February 1951

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Odessa, USSR
(46°30'N, 30°45'E)

1. Introduction

Odessa is located on the southwestern side of Odessa Bay in the extreme northwestern part of the Black Sea.

(Figure 1) It is the principal Black Sea port of the USSR, and serves as a commercial and trading port for a rich agricultural area including the Ukraine, and as a minor naval base. Exports since World War II include grain, coal, ores, lumber, and processed iron, together with trucks and other agricultural and industrial machinery which are consigned to satellite countries only. Imports include machinery, rubber, wool, cork, crude petroleum, olive oil, sugar, seed oil, and other foodstuffs.

The extensive damage to the port facilities which was inflicted during World War II has been repaired and some additional improvements have been made.

The city adjoins the port on the west and south. It is located on a hill which slopes steeply toward the sea. The estimated population of Odessa was 625,000 in January 1955.

2. Harbor

a. Summary

Odessa harbor is artificial and lies in the southwestern part of Odessa Bay. It is protected by a series of breakwaters, 3 of which are detached. (Figure 45)

b. Approach

The approach to the port is from the southeast and east through the Black Sea and into Odessa Bay through gradually diminishing depths. Shoals and other dangers to navigation are plainly charted. However, magnetic variation in Odessa Bay is largely affected by local influences and caution is therefore necessary. (Figure 46)

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c. Entrances

There are 3 entrances to Odessa Harbor each of which is between breakwaters--2 to the main or southern part of the harbor and 1 to the Petroleum Harbor. (Figure 45)

The southern entrance to the main harbor is approached from the north and is made between a long, curving breakwater known as Reidovi Mole, and the southeastern end of a long, detached breakwater running at right angles to Reidovi Mole. The entrance width between these breakwaters is about 1,050 feet, and the controlling depth is 31 feet. (Figure 3)

The second entrance to the main harbor is from the east, between the north end of the detached breakwater mentioned in the preceding paragraph and the south end of a T-shaped breakwater lying to the northward. There is a width of 1,400 feet at this entrance with a controlling depth of 27 feet for a distance of 1,000 feet. The approach to this entrance has been dredged to 30 feet with a least width of 400 feet. (Figure 4)

The third entrance leads to the north end of the port known as the Petroleum Harbor. The dredged channel from the east leads to a point near the north end of the detached breakwater. A northwesterly channel leads into the Petroleum Harbor. This channel also is dredged and has a controlling depth of 30 feet for a width of 350 feet. (Figure 4)

Pilotage is compulsory; experienced harbor pilots are available. There are no sea pilots. Harbor pilots board the vessels at the anchorage after inspection when alongside berths are available.

d. Breakwaters

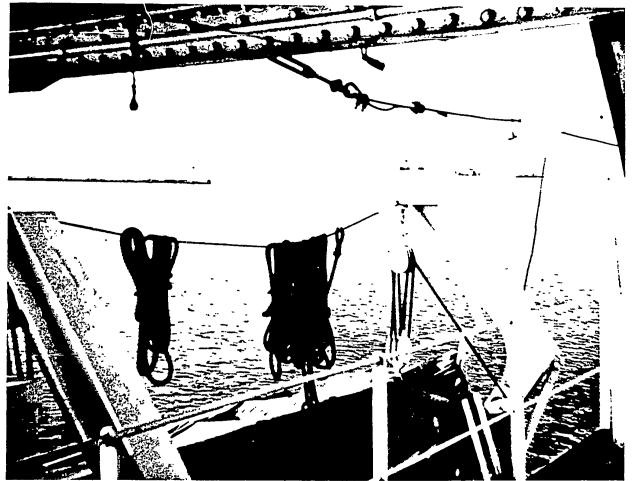
The port of Odessa is protected by a series of breakwaters, 2 of which are detached. On the south a dog-leg

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View looking NE from Quarantine Harbor showing southern entrance between breakwaters in background.

ONI 438679

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FIGURE 3

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View looking N showing northern entrance to main harbor (right arrow) between the detached breakwaters. Note warehouse under construction in foreground. Arrow to left indicates dredged channel to the Petroleum Harbor.

ONI 1104319

September 1951

FIGURE 4

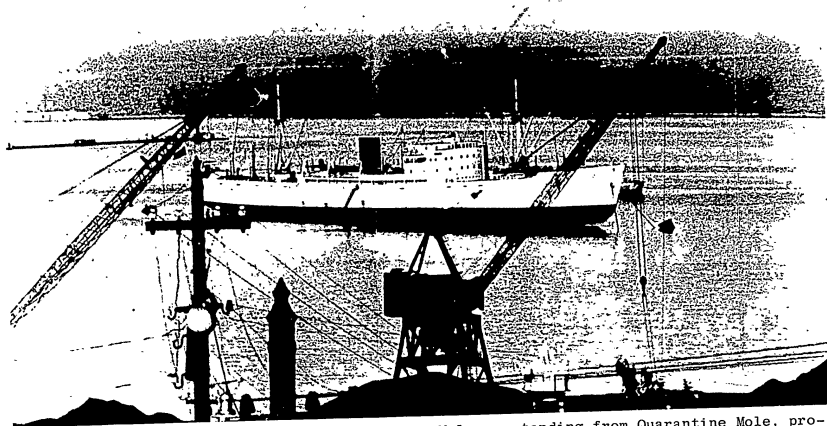
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Looking E showing curving breakwater - Reidovi Mole - extending from Quarantine Mole, protecting the harbor from the S. Note Vorontsovskiy Lighthouse at end of breakwater (upper left).

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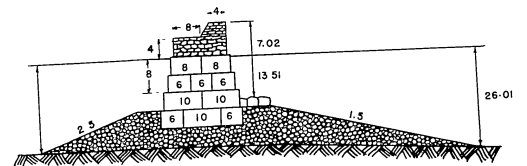
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View looking S showing curving breakwater extending seaward from Quarantine Mole affording protection to the port from the SE.

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July 1948



Sectional sketch of southern breakwater at Odessa. Dimensions in feet.

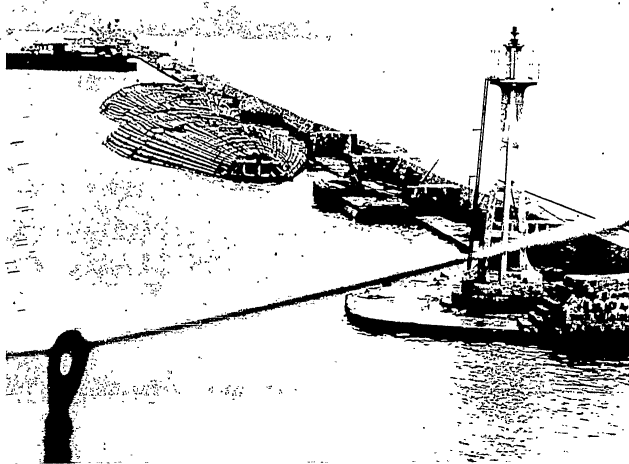
FIGURE 5
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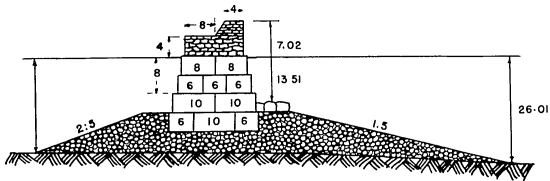
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Looking WNW from southern end of eastern detached breakwater. Note log rafts tied alongside.

ONI 440403

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Sectional sketch showing type of construction of eastern breakwater. Dimensions in feet.

FIGURE 6
PAGE 16

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Looking W showing New Breakwater in foreground. About 500 feet of this structure at the northern end are entirely submerged.

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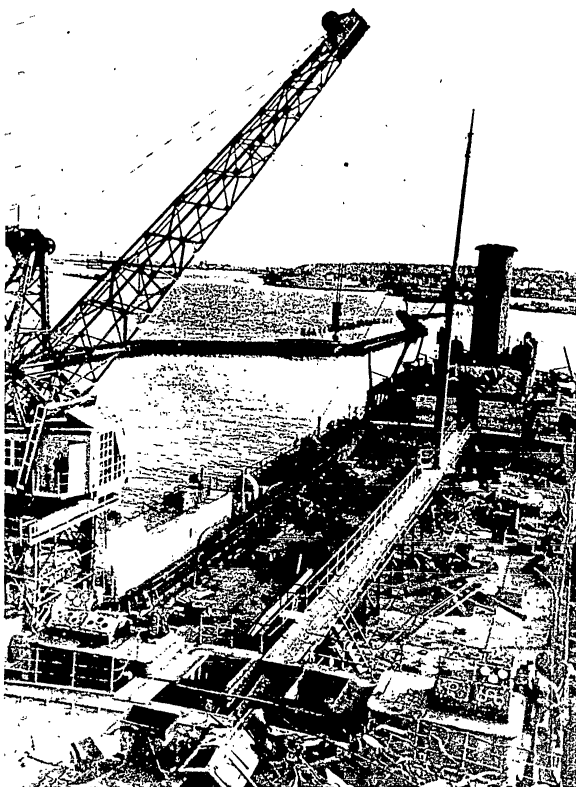
FIGURE 7

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Looking S showing irregularly shaped, detached breakwater which protects the Repair Basin at the Marti Shipyard.

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FIGURE 8

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pier known as Quarantine Mole extends from the shoreline for a distance of 2,820 feet in a general northeast direction. The total length of this pier is 3,930 feet. From the outer end of Quarantine Mole a long, curving breakwater, Reidovi Mole, extends in a northern direction for a distance of about 2,130 feet. The breakwater is constructed of artificial blocks weighing from 20 to 40 tons each, resting on a horizontal base of graded rubble. The blocks are placed in exact alignment, and vertical joints are separated and traverse the entire wall in order to compensate for uneven settling. The base is in the shape of ladder steps giving the battering face a slope which does not substantially exceed 2 feet on the vertical to 7 feet on the horizontal. Atop the wall there is a stone masonry parapet. The entire structure is 33.03 feet in height, extending about 15 feet above the surface of the water. The breakwater proper is 22 feet wide at the base, sloping to 16 feet in width at the base of the parapet, which is approximately 12 feet wide. (Figure 5) Vorontsovskiy Lighthouse, with a light elevation of 36 feet, is located at the tip of this breakwater. Adjoining the light is a small wooden shack used as a naval observation point and signal station.

At right angles to Reidovi Mole and approximately 1,150 feet shoreward from its outer end is the southernmost tip of a long, detached breakwater, which extends in a northwest direction roughly paralleling the shoreline about 0.5 nautical mile distant. This breakwater, which is about 4,000 feet in length, provides protection to the main harbor from the north and east. (Figure 6) The construction details of this breakwater are substantially the same as those of Reidovi Mole.

About 1,250 feet to the north of the northwestern end of this breakwater, a second detached breakwater extends in

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a more northerly direction. This structure, known as New Breakwater, has a total length of 1,700 feet; however, the northern 500 feet are entirely submerged. This breakwater serves as protection on the east to the lower reaches of Petroleum Harbor. Information is not available as to the construction details of this structure, except that it consists of blocks, while photographs show that the portion above the surface consists of large, unevenly placed, stone or concrete blocks. This breakwater also parallels the shoreline at a distance offshore of about 3,600 feet or slightly over one-half nautical mile. (Figure 7)

Directly inshore from New Breakwater there is a T-shaped breakwater with the base of the "T" connected with the shore. This structure separates Working Harbor on the north from Repair Basin on the south, while the head or top of the "T" provides protection for the 2 basins lying immediately to the west. Construction details are not available; however, photographs and other data indicate that the type of construction of this breakwater is similar to that of Reidovi Mole. (Figure 5)

Northward, protecting the Repair Basin, is an irregularly shaped, detached breakwater of wooden piles about 2,000 feet in length. This extends in a general north - south direction. (Figure 8)

The final protective structure to be considered at the port is an L-shaped quayed breakwater protecting and forming the northern and eastern extremities of Petroleum Harbor. This is known as the Oil Mole. It extends in a southeastern direction from shore about 1,700 feet. The head extends at right angles in a southwestern direction about 900 feet. The Oil Mole is about 120 feet wide for a distance of 1,400 feet out from shore. It then widens to about 150 feet at the outer end. The L-head or

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shorter section, which runs in a southwesterly direction, is about 90 feet wide. Construction details of Oil Mole are not available, but photos and other data indicate that part is of reinforced concrete and part of timber piling and decking.

e. Basins

Specific information concerning the individual basins at the port of Odessa is contained in the table of Basins.

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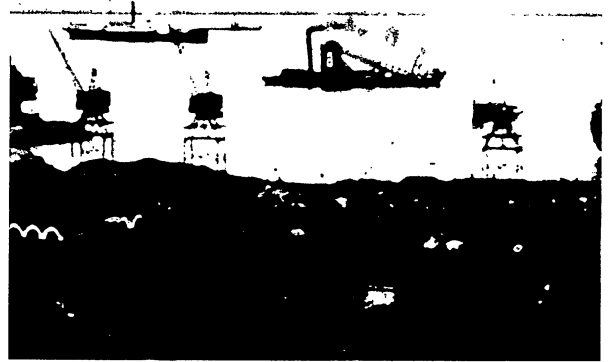
	Basins			Use	Entrance Width (feet)	Entrance Depth (feet)
	Length (feet)	Width (feet)	Area (acres)			
Quarantine Harbor	1,800	1,150	45.5	General cargo and grain	575	31
New Harbor	1,375	1,110	36	General cargo	1,700	28
Cabotage Harbor	1,180	1,080	31	Coal and General cargo	1,080	26
Pratique Harbor	1,500	1,230	42	Probably general cargo	325	24
Shipyards Basin	820	750	11	Ship repair	325	14
Repair Basin	1,400	1,230	40	do	395	25
Working Harbor	1,020	990	27	do	390	17
Petroleum Harbor	2,700	1,650	123	Petroleum products	350 (dredged channel)	30

Area of harbor not including basins is 455 acres. Total area of harbors including basins is 810.5 acres.

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Looking NE showing bucket dredge at work in inner portion of the Commercial Harbor.

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TABLE I

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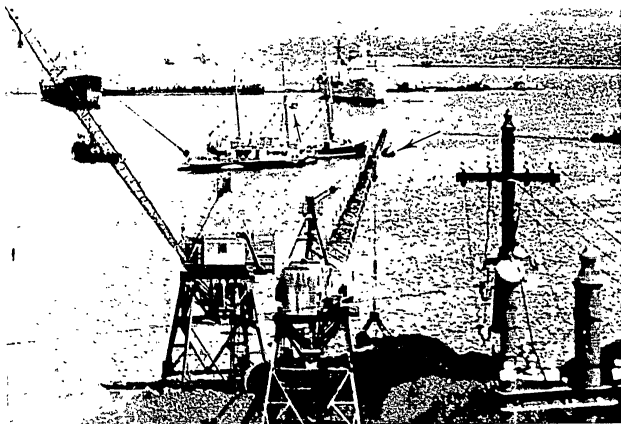
FIGURE 9

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View looking E showing Mediterranean-type moorings used by ships lying inside breakwater at Odessa. Note mooring buoys (arrows) near center of photo.

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FIGURE 10

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f. Liability to silting, dredging required, composition of bottom

Specific information regarding silting at the port and the amount and frequency of required dredging is not available. However, the 2 dredged channels mentioned above are apparently maintained at a depth of 30 feet and, because of the nature of the bottom, it may be assumed that some periodic dredging is carried out in the vicinity of the piers and quays. Bottom sediments at Odessa consist chiefly of mud with a layer of sand. (Figure 9)

Dredging was under way off the southern entrance to the port in August 1955, and in the area southeast of the Petroleum Pier adjoining the dredged channel leading to the Petroleum Harbor in September 1955.

g. Bridges and other obstructions crossing navigable parts of harbor

There are no bridges crossing the harbor, and the only known obstruction is a submarine cable extending between Quarantine Mole breakwater and the southern tip of the detached breakwater to the northwest.

h. Anchorages

Unlimited anchorage is available about 0.5 mile northeast of Vorontsovskiy Lighthouse which is at the head of Reidovi Mole. Thirty-five to 45 feet of water is available, and the bottom is sand with some mud. Although exposed to the east, this anchorage is considered generally good.

Moorings for 3 or 4 Class A-type vessels are available from buoys located inside and parallel to the detached breakwater. (Figure 10)

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A considerably larger number of vessels could be moored in this protected area through the use of Mediterranean moorings, which are widely used in the area. (Figure 10) This consists of tying vessels stern-to to the breakwater on its inner or protected side. The bow is held off by anchor or by mooring buoy.

1. Hydrographic conditions affecting navigation

Tides are negligible in the area. The spring range is 0.4 foot. The mean range is 0.2 foot, and the neap range is 0.1 foot. Atmospheric pressure and winds, rather than tides, cause the main variations in the water level of Odessa Bay. The level may be raised 2.0 feet above normal by strong easterly winds, and it may be lowered a like amount by strong winds from the northeast. The maximum recorded rise above the mean level is 2.7 feet, and maximum fall is 4.0 feet.

Ice conditions vary considerably with the severity of the winter. Normally, navigation at Odessa is maintained throughout the winter by the use of icebreakers. Modifications in the condition and limits of the ice may occur with a change in the synoptic pattern (temperature or wind change). Intense storms over the Black Sea will break up ice formations in open sea areas. A tabulation of the ice conditions is shown on the following page.

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	Vorontsovskiy Lighthouse (46°30'N, 30°46'E)	Bol'shoy Fontan Lighthouse (46°23'N, 30°45'E)
First Appearance of Ice		
Earliest	Dec. 12	Dec. 22
Latest	Jan. 22	Jan. 31
First Landfast Ice		
Earliest	Dec. 12	Jan. 1
Latest	Jan. 20	Feb. 2
Complete Freezing		
Earliest	Jan. 22	Feb. 16
Latest	Feb. 5	-
Ice Breakup		
Earliest	Jan. 28	Mar. 1
Latest	Mar. 1	-
Final Ice Clearance		
Earliest	Feb. 21	Feb. 21
Latest	Mar. 31	Mar. 28
Total Duration (Days)		
Maximum	92	54
Minimum	26	19
Maximum Ice Thickness		
Inches	24	6

3. Wharves

a. Summary

The port facilities at Odessa extend along the protected southwestern part of Odessa Bay for a distance of about 2.5 miles, with the general cargo and commercial wharves located in the southern part of the port; the coal handling wharves adjacent thereto in the central part; and the naval, shipbuilding and petroleum handling facilities concentrated in the northern part. (Figure 11)

b. Types of wharf facilities

The wharves and piers consist of reinforced concrete piers with reinforced concrete arches supporting reinforced concrete decking; masonry quays retaining solid fill; and open pile and timber deck construction for the Petroleum Pier.

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c. Wharf footage by usage, by depths

The berthing facilities for handling general cargo have 5,115 linear feet with alongside depths of 25 feet and over, 6,815 linear feet with alongside depths of 18 to 25 feet, 4,890 linear feet with alongside depths of 12 to 18 feet, and 1,525 linear feet with alongside depths of 5 to 12 feet. There are 1,900 linear feet with alongside depths of 17 feet for the handling of petroleum, 600 linear feet with alongside depths of 21 feet for the handling of grain, and 450 linear feet with alongside depths of 17 to 25 feet for ship repairs.

d. Vessel accommodation by class

These facilities provide berthing accommodations for 10 Class A-, 11 Class B-, 14 Class C-, and 19 Class D-type vessels, 13 lighters, and 9 Class T-D tankers. The lighters can service 1 Class A- and 2 Class B-type vessels in the harbor.

e. Estimated military port capacity

The present military unloading capacity of the port, based upon the handling of general cargo at the piers and quays, is estimated to range between 18,000 and 19,000 long tons of general cargo per 20-hour day. A phased study of the expansion possibilities indicates that the capacity could be increased about 3,800 tons.

f. Tabular details of piers and wharves

The known details of piers and quays together with photos and sectional sketches, where available, are shown in the table of Wharves (Piers, Quays, etc.) under 16 reference numbers. These numbers are used to designate their locations on the port plan, Figure 45.

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Looking E toward the Commer
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Looking E toward the Commercial Harbor of Odessa. Quarantine Mole may be seen in the background and New Harbor and Cabotage Harbor in the foreground.
ONI 490562, 490566, 490568

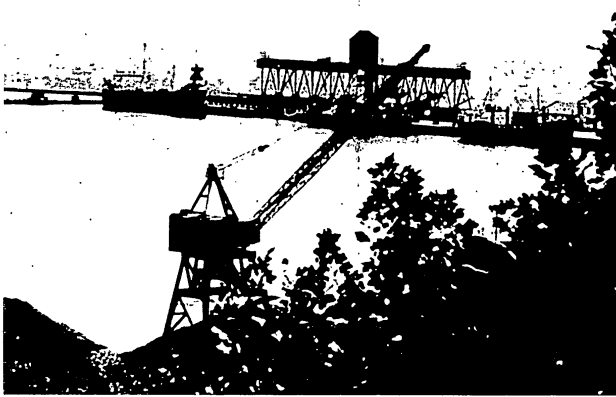
February 1951

SECRET

SECRET

R. & H. Bd.

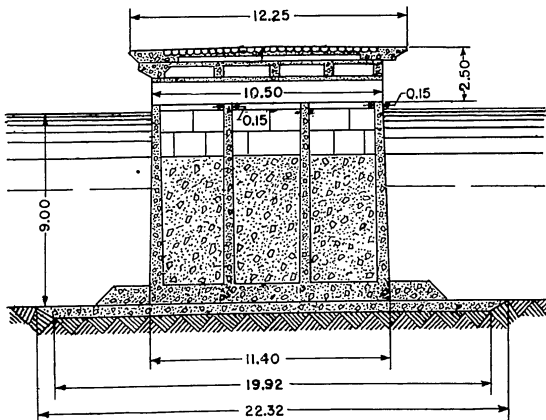
Odessa, USSR



View of wharf Ref. 1, looking E. Note grain handling facilities on wharf.

ONI 1104264

September 1951



Sectional sketch showing type of construction of Ref. 1. Dimensions in meters.

FIGURE 12
PAGE 30

SECRET

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R. & H. Bd.

Odessa, USSR

Wharves (Piers, Quays, etc.)	
Details of Wharf	Quarantine Mole
Ref. on Port Plan	1
Use	Grain handling and general cargo.
Type and Construction	Offshore wharf consisting of individual piers of reinforced concrete caissons filled with limestone or masonry blocks of stone or brick. The caissons measure 37.40 by 23.78 ft., and are spaced 48.93 ft. apart at the waterline. They support reinforced concrete arches and decking which is surfaced with stone blocks or cobblestone. Built along the N side of the wharf and adjoining it at the same level is a timber wharf about 6.56 ft. in width.
Load Capacity of Deck	Unlimited.
Height of Deck above Water (feet)	About 5
Dimensions (feet): Length overall	1,250
Usable berthing space	1,250
Depths alongside	19 to 30
Width of apron	About 20 to open.
Berthing Capacity	1 Class A, 2 Class B.
Transit Sheds (number): Construction	2 Frame.
Dimensions (feet)	200 by 50 and 270 by 60
Number of floors	1
Total floor area (sq.ft.)	About 26,000
Handling Facilities	2 traveling electric portal jib cranes of about 7-ton capacity; 1 overhead grain conveyor, multiple spouted. (Cranes also serve wharf Ref. 2)
Railroad Facilities	5-ft.-gauge spur tracks laid entire length of wharf flush with deck.
Road Clearance	Truck access with turning space.
Utilities: Water	Available.
Electricity	Available. Wharf lighted.
Potentialities for Expansion	Extend quay along inner or protected side of the breakwater about 500 ft. in a general NE direction. This would provide additional deepwater berthing, and permit an increase in the cargo handling capacity of about 500 T/day.
Remarks	...

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TABLE II

CONFIDENTIAL

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R. & H. Bd. Odessa, USSR

Wharves (Piers, Quays, etc.)-Continued

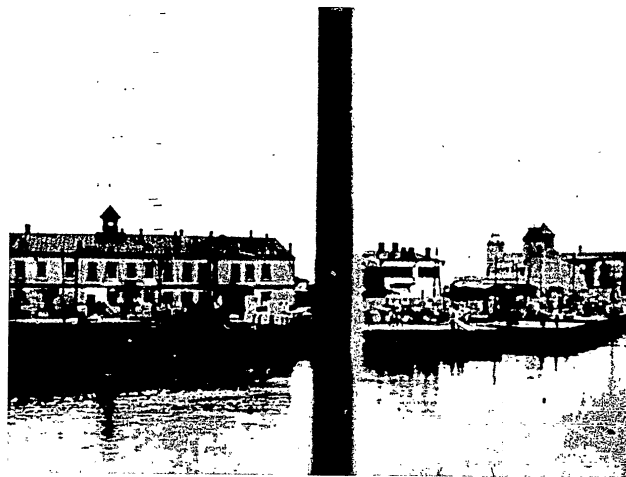
Details of Wharf	Quarantine Mole
Ref. on Port Plan	2
Use	General cargo.
Type and Construction	Offshore wharf consisting of individual piers of reinforced concrete caissons filled with limestone or masonry blocks of stone or brick. The caissons measure 37.40 by 23.78 ft., and are spaced 48.93 ft. apart at the waterline. They support reinforced concrete arches and decking which is surfaced with stone blocks or cobblestone. Built along the W side of the wharf and adjoining it at the same level is a timber wharf about 6.56 ft. in width.
Load Capacity of Deck	Unlimited.
Height of Deck above Water (feet)	About 5
Dimensions (feet):	
Length overall	700
Usable berthing space	700
Depth alongside	21
Width of apron	Open.
Berthing Capacity	2 Class B.
Transit Sheds	None.
Handling Facilities	2 electric traveling portal jib cranes of about 7-ton capacity. Also serve wharf Ref. 1.
Railroad Facilities	5-ft.-gauge spur tracks laid entire length of wharf flush with deck.
Road Clearance	Truck access with turning space.
Utilities:	
Water	Available.
Electricity	Available. Wharf lighted.
Potentialities for Expansion	None.
Remarks	...
TABLE II	-32-

CONFIDENTIAL

UNCLASSIFIED

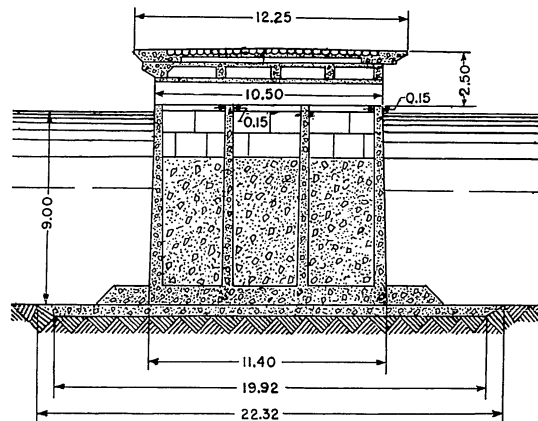
R. & H. Bd.

Odessa, USSR



Looking E toward wharf Ref. 2. Note cargo piled on wharf unprotected from the weather.

1929



Sectional sketch showing type of construction of Ref. 2. Dimensions in meters.

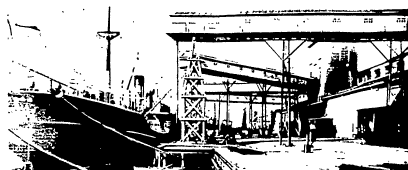
UNCLASSIFIED

FIGURE 13
PAGE 33

CONFIDENTIAL

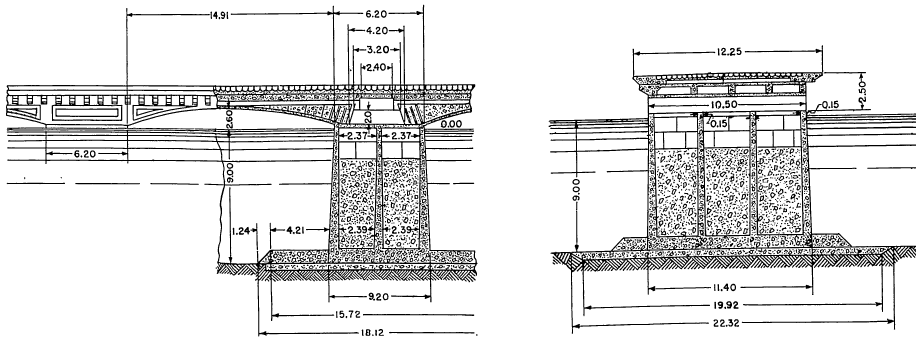
R. & H. Bd.

Odessa, USSR



Looking N along wharf Ref. 3. Note timber wharf along W side of main wharf.

Prior to 1939



Sketches showing type of construction of Ref. 3. Dimensions in meters.

FIGURE 14
PAGE 34

CONFIDENTIAL

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Odessa, USSR

Wharves (Piers, Quays, etc.)-Continued	
Details of Wharf	Quarantine Mole
Ref. on Port Plan	3
Use	Grain handling.
Type and Construction	Offshore wharf consisting of individual piers of reinforced concrete caissons filled with limestone or masonry blocks of stone or brick. The caissons measure 37.40 by 23.78 ft., and are spaced 48.93 ft. apart at the waterline. They support reinforced concrete arches and decking which is surfaced with stone blocks or cobblestone. Built along the W side of the wharf and adjoining it at the same level is a timber wharf about 6.56 ft. in width.
Load Capacity of Deck	Unlimited.
Height of Deck above Water (feet)	About 5
Dimensions (feet):	
Length overall	600
Usable berthing space	600
Depth alongside	21
Width of apron	20 to open.
Berthing Capacity	1 Class B, 1 Class C.
Transit Sheds (number):	2 or more.
Construction	Corrugated iron.
Dimensions (feet)	Approx. 50 by 100 each.
Number of floors	1
Total floor area (sq.ft.)	Approx. 10,000
Handling Facilities	1 overhead grain conveyor, multiple spouted. 1 or more floating grain spouts.
Railroad Facilities	5-ft.-gauge spur tracks laid entire length of wharf flush with deck.
Road Clearance	Truck access with turning space.
Utilities:	
Water	Available.
Electricity	Available. Wharf lighted.
Potentialities for Expansion	None.
Remarks	...

CONFIDENTIAL

TABLE II

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Odessa, USSR

Wharves (Piers, Quays, etc.)-Continued

Details of Wharf	Quarantine Mole
Ref. on Port Plan	4
Use	Ship repair.
Type and Construction	Stone masonry or reinforced concrete quay wall retaining solid fill. Deck surfaced with stone block or cobblestone.
Load Capacity of Deck	Unlimited.
Height of Deck above Water (feet)	About 5
Dimensions (feet): Length overall	450
Usable berthing space	450 (Used by ships undergoing repair only.)
Depths alongside	17 to 25
Width of apron	Open.
Berthing Capacity	1 Class B.
Transit Sheds	None.
Handling Facilities	1 floating crane located here in 1955. Probably permanently based at the port. 1 and possibly 2 electric jib cranes.
Railroad Facilities	5-ft.-gauge spur tracks laid on wharf flush with deck.
Road Clearance	Truck access.
Water and Electricity	Available.
Potentialities for Expansion	None.
Remarks	There are no drydocking facilities at this yard.

TABLE II

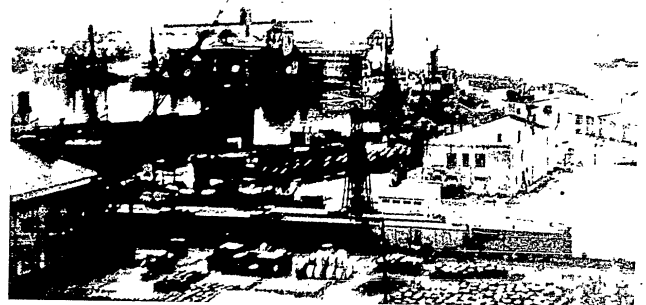
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SECRET

R. & H. Bd.

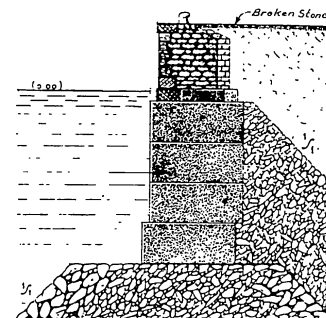
Odessa, USSR



Looking NE from the foot of Quarantine Mole showing wharf Ref. 4, (arrow). Note ships tied up for repair and floating derrick in Repair Basin.

50X1

September 1953



Sketch showing type of construction of wharf Ref. 4. Scale approximate.

-37-

FIGURE 15

SECRET

SECRET

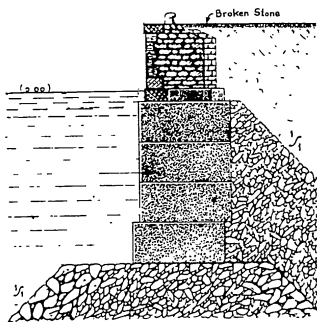
R. & H. Bd.

Odessa, USSR



Looking NE from the foot of Quarantine Mole toward Bakalanya Quay (wharf Ref. 5). (arrow). Note cargo stored in open along quays.

September 1953



Sketch showing type of construction of Ref. 5. Scale approximate.

FIGURE 16

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SECRET

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Odessa, USSR

Quarantine Harbor
Wharves (Piers, Quays, etc.)-Continued

Details of Wharf	Bakalanya Quay
Ref. on Port Plan	5
Use	Ship repair and general cargo.
Type and Construction	Stone masonry or reinforced concrete quay wall retaining solid fill. Deck surfaced with stone block or cobblestone.
Load Capacity of Deck	Unlimited.
Height of Deck above Water (feet)	About 5
Dimensions (feet): Length overall	240 + 240
Usable berthing space	240 + 240
Depth alongside	20
Width of apron	Open.
Berthing Capacity	1 Class C, 1 Class D.
Transit Sheds (number): Construction	3 2 Probably frame. Stone or concrete.
Dimensions (feet)	About 100 by 60 each.
Number of floors	1 2
Total floor area (sq.ft.)	42,000
Handling Facilities	n a
Railroad Facilities	5-ft.-gauge spur tracks laid on wharf flush with deck.
Road Clearance	Truck access.
Water and Electricity	Available.
Potentialities for Expansion	None.
Remarks	There are no drydocking facilities at this yard.

50X1

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CONFIDENTIAL

TABLE II

R. & H. Bd.	CONFIDENTIAL	Odessa, USSR
Quarantine Harbor Wharves (Piers, Quays, etc.)-Continued		
Details of Wharf	:	Bakalanya Quay
Ref. on Port Plan	:	6
Use	:	General cargo.
Type and Construction	:	Stone masonry quay wall retaining solid fill. Deck surfaced with stone block or cobblestone. Built along the outside of the quay is a timber wharf about 6.56 ft. wide. This structure is supported by piles and is in poor condition.
Load Capacity of Deck	:	Unlimited, except for outer 6.56 ft.
Height of Deck above Water (feet)	:	About 6
Dimensions (feet): Length overall	:	900 + 920
Usable berthing space	:	900 + 920
Depths alongside	:	27 to 31
Width of apron	:	Open.
Berthing Capacity	:	2 Class A, 2 Class B.
Transit Sheds	:	None.
Handling Facilities	:	7 electric traveling portal jib cranes of 7-ton capacity each.
Railroad Facilities	:	5-ft.-gauge spur tracks on quay flush with deck.
Road Clearance	:	Truck access.
Water and Electricity	:	Available.
Potentialities for Expansion	:	None.
Remarks	:	...

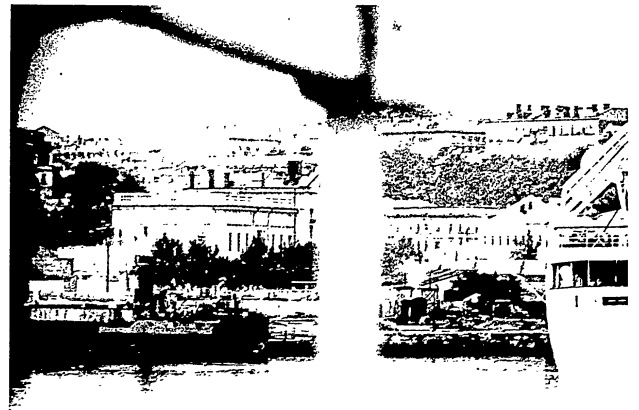
TABLE II

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CONFIDENTIAL

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R. & H. Bd.

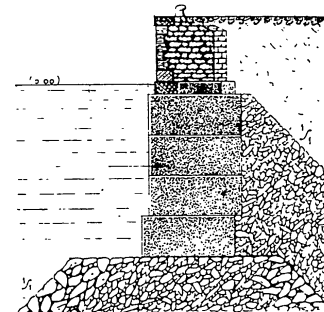
Odessa, USSR



Looking S toward Bakalanya Quay (wharf Ref. 6).

ONI 440406

September 1948



Sectional sketch showing type of construction of Ref. 6. Scale approximate.

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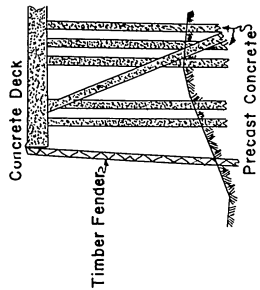
FIGURE 17

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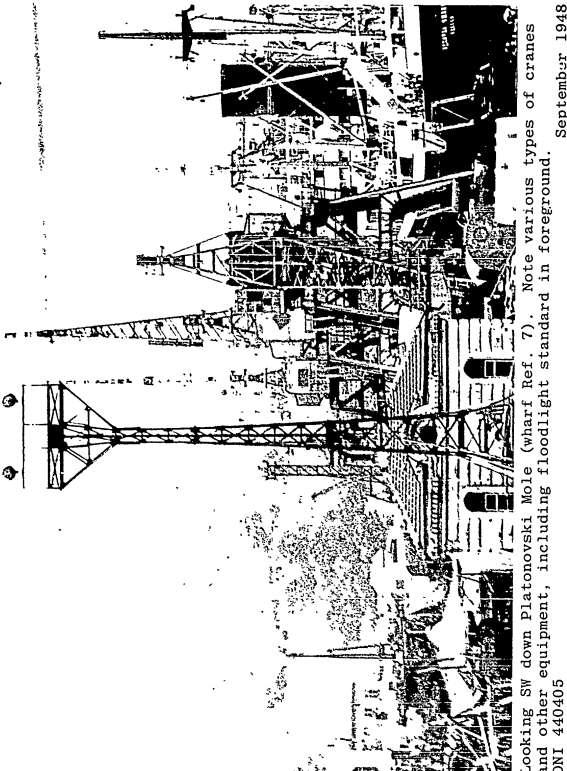
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R. & H. Bd.

Odessa, USSR



Sketch showing type of construction of Ref. 7.



Looking SW down Platonovski Mole (wharf Ref. 7). Note various types of cranes and other equipment, including floodlight standard in foreground. September 1948 ONI 440405

SECRET

FIGURE 18

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Odessa, USSR

Wharves (Piers, Quays, etc.)-Continued

Details of Wharf	Platonovski Mole		
Ref. on Port Plan	7		
Use	General cargo.		
Type and Construction	Pier with octagonal-shaped concrete piles, with a reinforced concrete deck. The N side of this pier is faced with wooden frame fenders affording about 2-ft. clearance from the pierside. The fenders are fixed by large, countersunk, iron staples.		
Load Capacity of Deck	n a		
Height of Deck above Water (feet)	About 6		
Dimensions (feet):	S Side	Face	N Side
Length overall	750	150	990
Usable berthing space	750	150	990
Depths alongside	25 to 33		
Width of apron	Open pier.		
Berthing Capacity	2 Class A, 1 Class B, 1 Class C.		
Transit Sheds	None.		
Handling Facilities	4 electric traveling portal jib cranes of about 7-ton capacity each.		
Railroad Facilities	Rail lines on pier.		
Road Clearance	Truck access.		
Water and Electricity	Available on pier.		
Potentialities for Expansion	None.		
Remarks	...		

CONFIDENTIAL

TABLE II

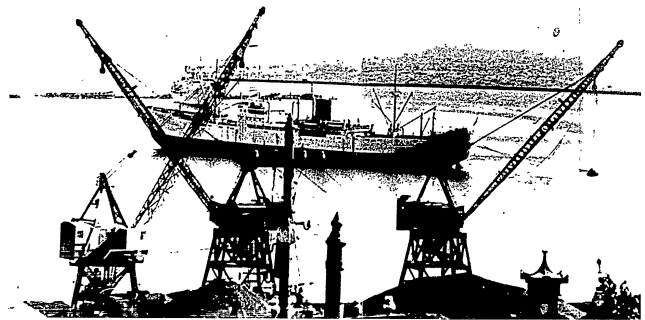
CONFIDENTIAL	
R. & H. Bd.	Odessa, USSR
Wharves (Piers, Quays, etc.)-Continued	
Details of Wharf	New Harbor Quay
Ref. on Port Plan	8
Use	Coal and general cargo.
Type and Construction	Stone masonry or reinforced concrete quay wall retaining solid fill. Asphalt surface. Built along the outside of the quay is a timber wharf about 6.56 ft. wide. This structure is supported by piles and is in poor condition. Quay is faced with wooden frame fenders, affording 2-ft. clearance from quayside.
Load Capacity of Deck	Unlimited.
Height of Deck above Water (feet)	About 8
Dimensions (feet):	
Length overall	195 960
Usable berthing space	195 930
Depth alongside	31 25 to 31
Width of apron	Open.
Berthing Capacity	1 Class A, 1 Class B.
Transit Sheds (number):	1
Construction	Brick structure with arched roof, probably of corrugated iron.
Dimensions (feet)	185 by 65
Number of floors	2
Total floor area (sq.ft.)	24,050
Handling Facilities	4 electric traveling portal jib cranes of about 7-ton capacity each.
Railroad Facilities	5-ft.-gauge rail tracks on quay. Outermost track 20 ft. from quay face.
Road Clearance	Truck access with turning space.
Utilities:	
Water	Available on quay; delivery rate slow.
Electricity	Available on quay.
Potentialities for Expansion	None.
Remarks	Coal storage on quay.

TABLE II -44- **CONFIDENTIAL**

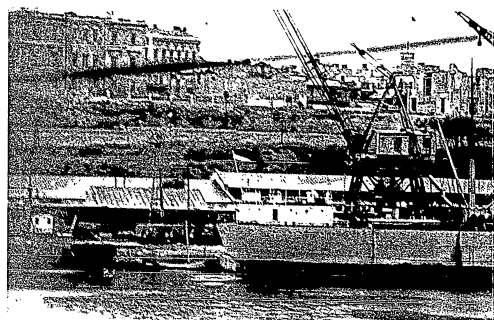
R. & H. Bd.

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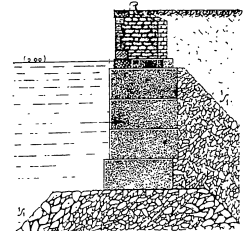
Odessa, USSR



Looking NE toward New Harbor Quay (wharf Ref. 8). Note traveling cranes and stocks of coal piled on quay.
ONI 1104261 September 1951



Looking SW toward New Harbor Quay. Note covered storage sheds at rear.
ONI 440408 September 1948



Sectional sketch showing type of construction of the permanent portion of New Harbor Quay. Built along the face of the quay is a timber wharf about 6.56 ft. wide. This is not shown in the sketch.

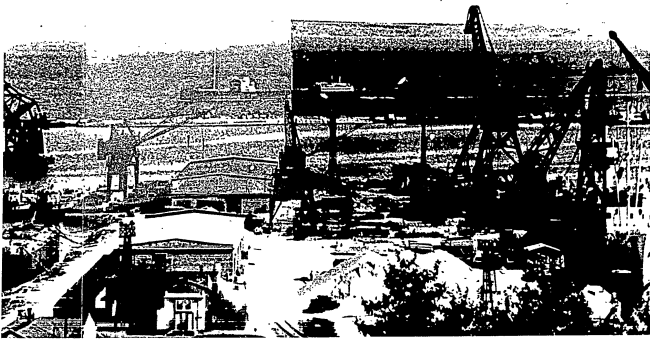
FIGURE 19
PAGE 45

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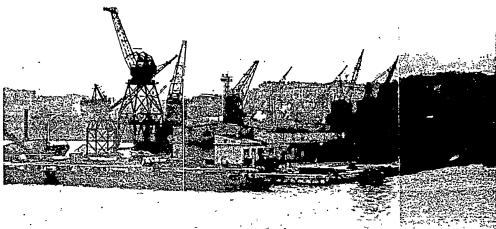
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R. & H. Bd.

Odessa, USSR

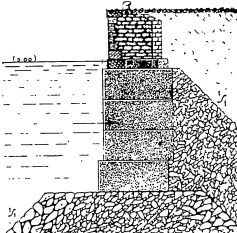


Looking NE from the foot of New Mole Pier. Note transit sheds, tower lighting facilities, and numerous cranes, together with rail lines and truck clearance facilities. September 1951 ONI 1104283



Looking S toward New Mole Pier, wharf Ref. 9. Note lighters tied at head of pier. April 1955 ONI 1237420

FIGURE 20
PAGE 46



Sectional sketch showing type of construction of New Mole Pier. Not to scale.

SECRET

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Odessa, USSR

Wharves (Piers, Quays, etc.)-Continued

Details of Wharf	New Mole Pier (Coal Quay)		
Ref. on Port Plan	9		
Use	Coal and general cargo.		
Type and Construction	Stone masonry pier with stone and earth backfill surfaced with stone blocks or cobblestone. War damage to this pier was repaired with poured concrete.		
Load Capacity of Deck	Unlimited.		
Height of Deck above Water (feet)	6.5		
Dimensions (feet):	SE Side	Face	NW Side
Length overall	885 + 200	230	1,030
Usable berthing space	885 + 200	230	1,030
Depths alongside	24	29	22
Width of apron	Open.		
Berthing Capacity	3 Class A, 1 Class B, 1 Class D.		
Transit Sheds (number):	2		
Construction	Permanent type; probably reinforced concrete.		
Dimensions (feet)	150 by 60		
Number of floors	1		
Total floor area (sq.ft.)	18,000		
Handling Facilities	5 electric traveling portal jib cranes of 7- to 10-ton capacities, 1 electric traveling portal jib crane of about 15-ton capacity; 1 shearlegs derrick of about 20-ton capacity.		
Railroad Facilities	3 rail lines on pier raised above deck level. 2 lines terminate half way out; the 3d extends full length of pier.		
Road Clearance	Truck access.		
Water and Electricity	Outlets on pier.		
Potentialities for Expansion	None.		
Remarks	...		

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CONFIDENTIAL

TABLE II

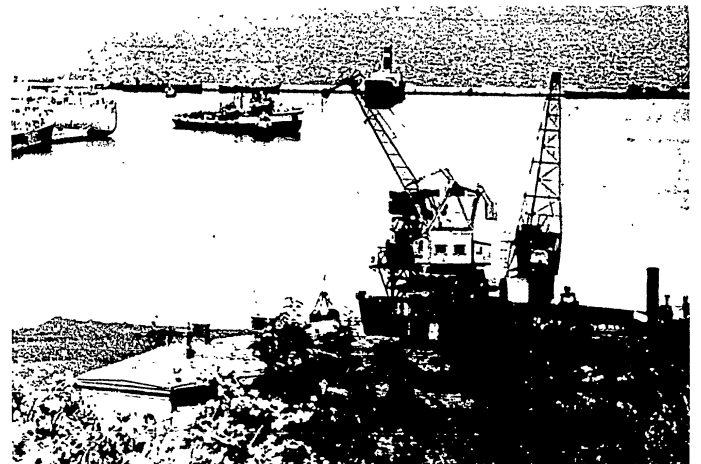
CONFIDENTIAL	
R. & H. Bd.	Odessa, USSR
Wharves (Piers, Quays, etc.)-Continued	
Details of Wharf	Cabotage Harbor Quay
Ref. on Port Plan	10
Use	General cargo.
Type and Construction	Stone masonry quay wall retaining solid fill. Probably asphalt surfacing.
Load Capacity of Deck	Unlimited.
Height of Deck above Water (feet)	About 6
Dimensions (feet):	
Length overall	1,100
Usable berthing space	1,100
Depths alongside	14 to 18
Width of apron	Open.
Berthing Capacity	4 Class C.
Transit Sheds	None.
Handling Facilities	2 electric traveling portal jib cranes of about 10-ton capacity.
Railroad Facilities	Rail lines on quay.
Road Clearance	Truck access.
Water and Electricity	Available.
Potentialities for Expansion	None, although minor dredging would improve the usefulness of the quay.
Remarks	...

TABLE II

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CONFIDENTIAL

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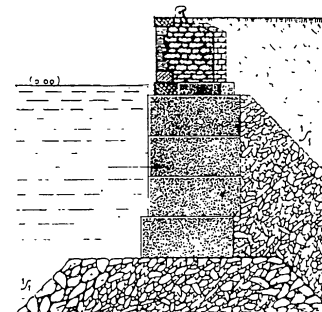
R. & H. Bd. Odessa, USSR



Looking NE with Cabotage Harbor Quay (wharf Ref. 10) in foreground. Note traveling cranes rigged with coal grabs.

ONI 1104290

September 1951



Sectional sketch showing type of construction of Ref. 10. Not to scale.

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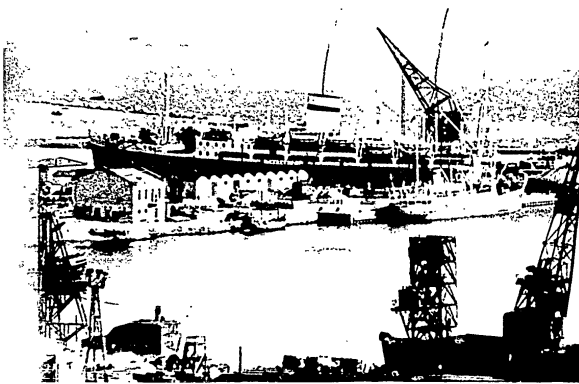
FIGURE 21

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R. & H. Bd.

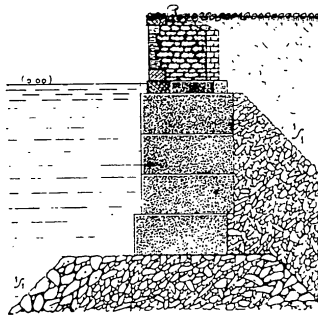
Odessa, USSR



Looking N toward Military Mole (wharf Ref. 11). Note large traveling jib crane and smaller crawler-type cranes on pier.

ONI 1104270

September 1951



Sectional sketch showing type of construction of Military Mole.. Not to scale.

FIGURE 22

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SECRET

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Odessa, USSR

Wharves (Piers, Quays, etc.)-Continued			
Details of Wharf	Military Mole		
Ref. on Port Plan	11		
Use	General cargo.		
Type and Construction	Stone masonry pier consisting of masonry walls retaining solid fill, cobblestone surfacing.		
Load Capacity of Deck	Unlimited.		
Height of Deck above Water (feet)	About 6		
Dimensions (feet):	SE Side	Face	NW Side
Length overall	1,250	490	2,030
Usable berthing space	1,250	490	300-230-165
Depths alongside	18	Abt. 25	Abt. 20 22 15
Width of apron	Open.		
Berthing Capacity	1 Class A, 7 Class C.		
Transit Sheds (number):	1	1	
Construction	Masonry or brick.	Timber frame with corrugated iron siding and roof.	
Dimensions (feet)	140 by 50	140 by 140	
Number of floors	1	1	
Total floor area (sq.ft.)	26,600		
Handling Facilities	2 electric traveling portal jib cranes of about 7- to 10-ton capacity.		
Railroad Facilities	Rail tracks on pier.		
Road Clearance	Truck access.		
Utilities:			
Water	Available.		
Electricity	Available. Pier lighted.		
Potentialities for Expansion	The approx. 1,300 lin. ft. on the NW Side of this pier, which consists of a stone block embankment, should be rebuilt to provide berthing. This would increase the unloading capacity of the pier about 1,300 T/day.		
Remarks	Crane tracks on this pier are raised. About 1,300 ft. on NW Side is a stone block embankment unsuitable for either cargo handling or idle berthing. The pier narrows in width toward shore to 200 ft., curving inward from the head on the NW side.		

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TABLE II

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Odessa, USSR

Pratique Harbor
Wharves (Piers, Quays, etc.)-Continued

Details of Wharf	Apbuznaya Quay
Ref. on Port Plan	12
Use	Probably general cargo.
Type and Construction	Stone masonry quay wall retaining solid fill. Stone block or cobblestone paving.
Load Capacity of Deck	Unlimited.
Height of Deck above Water (feet)	5 to 6
Dimensions (feet): Length overall	850 + 275
Usable berthing space	850 + 275
Depths alongside	12 to 15
Width of apron	Open.
Berthing Capacity	5 Class D.
Transit Sheds	None.
Handling Facilities	n a
Railroad Facilities	Rail tracks on quay.
Road Clearance	Truck access.
Water and Electricity	Available.
Potentialities for Expansion	Minor dredging along the quay would improve the usefulness for deeper draft vessels, but would not increase the unloading capacity.
Remarks	...

TABLE II

CONFIDENTIAL

SECRET

R. & H. Bd.

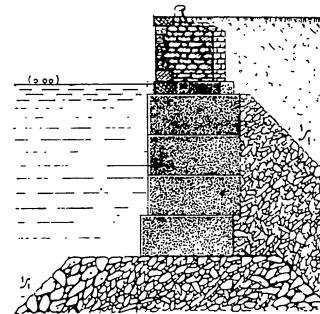
Odessa, USSR



Looking N toward Apbuznaya Quay, Pratique Harbor (wharf Ref. 12) (arrow). Naval Harbor in foreground, Marti Shipyard in background.

ONI 1237428

April 1955



Sectional sketch showing type of construction of Apbuznaya Quay. Not to scale.

FIGURE 23

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SECRET

R. & H. Bd.

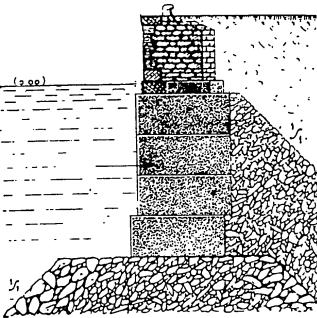
Odessa, USSR



Looking N toward Androsovski Mole (wharf Ref. 13) in background (arrows).

ONI 1237429

April 1955



Sectional sketch showing type of construction of Ref. 13. Not to scale.

FIGURE 24

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SECRET

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R. & H. Bd.

Odessa, USSR

Wharves (Piers, Quays, etc.)-Continued	
Details of Wharf	Androsovski Mole
Ref. on Port Plan	13
Use	General cargo, fitting-out and naval activities.
Type and Construction	Stone masonry pier consisting of masonry walls retaining solid fill; cobblestone surfacing.
Load Capacity of Deck	Unlimited.
Height of Deck above Water (feet)	About 6
Dimensions (feet):	
Length overall	1,150
Usable berthing space	1,150
Depth alongside	11
Width of apron	Open.
Berthing Capacity	10 lighters.
Transit Sheds	None.
Handling Facilities	n a
Railroad Facilities	Rail lines on pier.
Road Clearance	Truck access.
Water and Electricity	Available.
Potentialities for Expansion	Minor dredging along this pier would permit its use by coastwise vessels and probably result in increasing the unloading capacity by 200 T/day.
Remarks	...

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CONFIDENTIAL

TABLE II

CONFIDENTIAL		Odessa, USSR	
Wharves (Piers, Quays, etc.)-Continued			
Details of Wharf	:	Potapovski Mole	
Ref. on Port Plan	:	14	
Use	:	General cargo and naval activities.	
Type and Construction	:	Stone masonry pier consisting of masonry walls retaining solid fill; cobblestone surfacing. This forms the T-head of Androsovski Mole.	
Load Capacity of Deck	:	Unlimited.	
Height of Deck above Water (feet)	:	About 6	
Dimensions (feet):	:	<u>SE Side</u>	<u>NE Side of T</u>
Length overall	:	850	375
Usable berthing space	:	850	375
Depths alongside	:	12 to 17	6
Width of apron	:	Open.	
Berthing Capacity	:	8 Class D, 3 lighters.	
Transit Sheds	:	None.	
Handling Facilities	:	n a	
Railroad Facilities	:	Rail lines on approach.	
Road Clearance	:	Truck access.	
Water and Electricity	:	Available.	
Potentialities for Expansion	:	Minor dredging along this pier would permit its use by coastwise vessels of deeper draft and probably result in increasing the unloading capacity by 200 T/day.	
Remarks	:	...	

TABLE II

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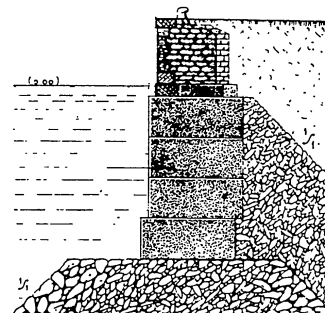
R. & H. Bd. Odessa, USSR



Looking W toward Potapovski Mole (wharf Ref. 14) in background. Photo shows only southern portion of the mole. (arrows)

April 1955

50X



Sectional sketch showing type of construction of Potapovski Mole. Not to scale.

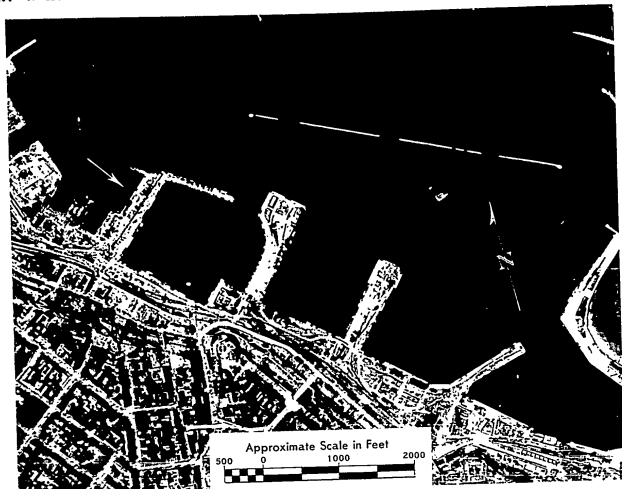
-57-

FIGURE 25

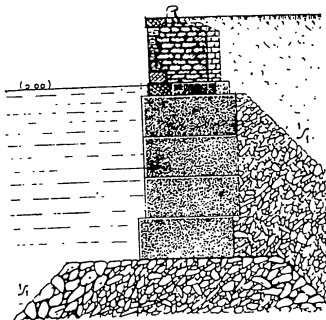
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Looking N toward the port of Odessa, showing Androsovski Mole, (wharf Ref. 15) (arrow). Most of the war damage shown in the photo has since been repaired.
May 1944
German Aerial



Sectional sketch showing type of construction of Androsovski Mole. Not to scale.

FIGURE 26

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Wharves (Piers, Quays, etc.)-Continued

Details of Wharf	
Ref. on Port Plan	15 NW Side of Androsovski Mole.
Use	General cargo and ship repair.
Type and Construction	Solid-fill pier with sloping banks.
Load Capacity of Deck	Unlimited.
Height of Deck above Water (feet)	6
Dimensions (feet):	
Length overall	800
Usable berthing space	800
Depth alongside	15
Width of apron	75
Berthing Capacity	4 Class D.
Transit Sheds	None.
Handling Facilities	None.
Railroad Facilities	Track 150 ft. from face of quay.
Road Clearance	Truck access.
Water and Electricity	Available.
Potentialities for Expansion	None.
Remarks	...

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TABLE II

R. & H. Bd. **CONFIDENTIAL** Odessa, USSR**Wharves (Piers, Quays, etc.)-Continued**

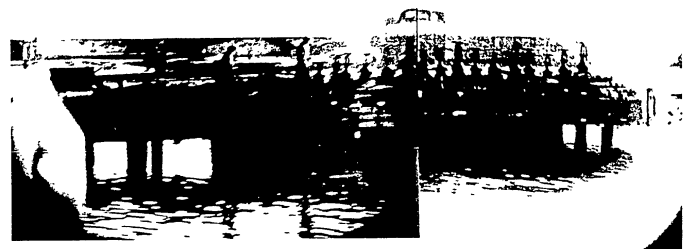
Details of Wharf	Petroleum Pier
Ref. on Port Plan	16
Use	Petroleum handling.
Type and Construction	Pier of open piling. Part of the deck is reinforced concrete, and the balance is timber.
Load Capacity of Deck	n a
Height of Deck above Water (feet)	6
Dimensions (feet): Length overall	2,200
Usable berthing space	1,900
Depth alongside	17
Width of apron	60 to 100
Berthing Capacity	9 T-D tankers.
Transit Sheds	None.
Handling Facilities	None. (See Remarks.)
Railroad Facilities	1 track dead ends at head of pier.
Road Clearance	Truck access.
Water and Electricity	Available.
Potentialities for Expansion	None.
Remarks	There are 10 oil lines on this pier, 6 of which are 12 in. and the remaining 4 are 8 in. These lines lead underground to storage tanks a short distance W of the foot of the pier. (Figure 45)

TABLE II

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CONFIDENTIAL**SECRET**

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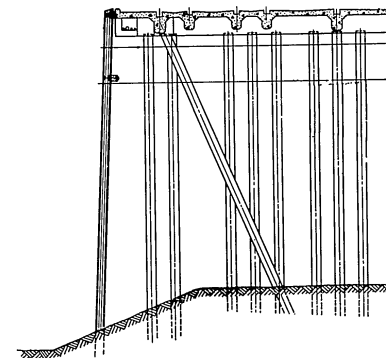
Odessa, USSR



Looking N showing Petroleum Pier (wharf Ref. 16). Part of the pier has concrete decking, and the balance is timber decked. Note petroleum pipelines and valves.

CIA 174121

April 1955



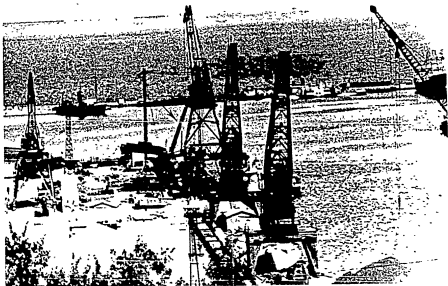
Sectional sketch showing type of construction of the Petroleum Pier. Not to scale.

FIGURE 27
PAGE 61**SECRET**

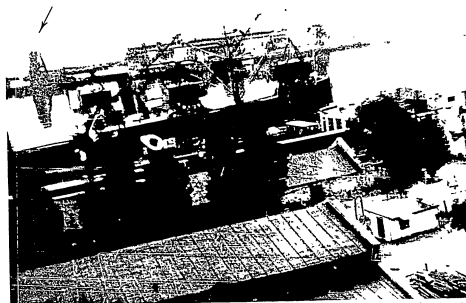
R. & H. Bd.

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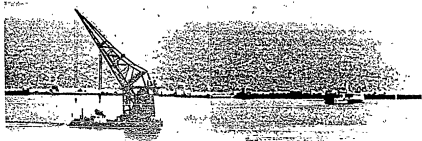
Odessa, USSR



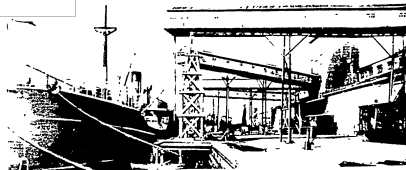
View of traveling cranes on New Mole Pier, (wharf Ref. 9). Note shearlegs derrick (arrow).
ONI 1104293 September 1951



Looking E toward wharf Ref. 3, on Quarantine Mole (background) showing grain handling equipment on the mole. One of a number of floating grain spouts at the port may be seen in the upper left hand corner of the photo.
September 1953



View of self-propelled crane based at the port.
ONI 1104291 September 1951



Another view of the grain conveyors on wharf Ref. 3.
1939



A floating shearlegs used in the repair basin may be seen extending above the vessel at the center of the photo.
July 1952

FIGURE 28
PAGE 62

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Odessa, USSR

4. Mechanical handling facilities
a. Cranes ashore and afloat

There are approximately 30 shore-based cranes at Odessa normally used in the handling of general cargo. These are electric traveling portal jib cranes varying in capacity from 7 to 15 tons. The specific locations of these cranes are given in the table of Cranes Ashore.

In addition, there are 30 or more crawler-type cranes of approximately 1.5- to 3-ton capacity, and probably diesel-powered. These are used at various locations in the port.

At the southeastern tip of New Mole Pier (wharf Ref. 9), there is a shearlegs derrick of about 20-ton capacity.

In 1955 the following floating cranes were located at Odessa: 1 of 150 tons; 1 of 50 tons, self-propelled; 1 of 20 tons; and one 2-ton crane mounted on a 400-ton, self-propelled lighter. In addition, there was 1 self-propelled, floating shearlegs, capacity unknown. (Figure 28)

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50X1

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Odessa, USSR

Cranes Ashore

Wharf Ref. and Name	Number	Type and Power	Capacity (tons)
1 Quarantine Mole (These cranes serve Refs. 1 and 2)	2	Electric traveling portal jib.	7
6 Bakalanya Quay	7	do	7
7 Platonovski Mole	4	do	7
8 New Harbor Quay	4	do	7
9 New Mole Pier (Coal Quay)	5 1	do do	7 to 10 15
10 Cabotage Harbor Quay	2	do	10
11 Military Mole	2	do	7 to 10

TABLE III

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Odessa, USSR

b. Specialized handling equipment

There are 2 multiple-spouted overhead grain conveyors located on Quarantine Mole at wharves Refs. 1 and 3. There are also 1 or more floating grain spouts at this mole. Much of the grain arriving in lighters at Odessa does not require storage or movement ashore, since it is transshipped directly into export ships without touching land. Information is not available as to the capacity of these grain handling devices.

The grain silos at wharves Refs. 1 and 3 are equipped with semiportal control towers for the pressure and vacuum tubes. There are 3 such towers at each wharf reference, each equipped with 4 flexible grain tubes. The bottom part of the equipment is formed by a joined and braced double gantry; the legs nearest the quayside are equipped with wheels running on crane-type rails. The inner wheels are located at the inner end of the gantry and run on a buttress which extends the length of the silo building, about 20 feet from the ground. On top of the double gantry is the control cabin and housing for the grain tubes. (Figures 29 and 30)

5. Port maintenance and engineer equipment afloat

a. Tugs

In 1955 there were 7 harbor tugs located at the port as follows:

Tugs	Horsepower
2	2,000 each
1	500
2	250 each
2	n a

In addition to the above, there were 5 smaller tugs; information on horsepower is not available.

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b. Dredges

One bucket dredge and 1 suction dredge are located at Odessa together with 2 or more self-propelled hopper barges. (Figure 31, upper photo) In 1956 there were 10 or more dumb barges used for various purposes at the port.

c. Piledrivers

There are 2 and possibly 3 piledrivers at Odessa. Their types and capacities are not available. (Figure 31, lower photo)

d. Block handling cranes

No information is available regarding block handling cranes at the port. Work on the breakwaters is accomplished with the use of the floating cranes.

e. Salvage equipment

One large salvage ship was working off the port in October 1952 clearing away shipwrecks. No additional information is available.

f. Fireboats

No information is available.

g. Icebreakers

Although it is known that icebreakers are used when necessary, the number and size of such vessels located at Odessa are not known. One icebreaker was located at the port in 1956.

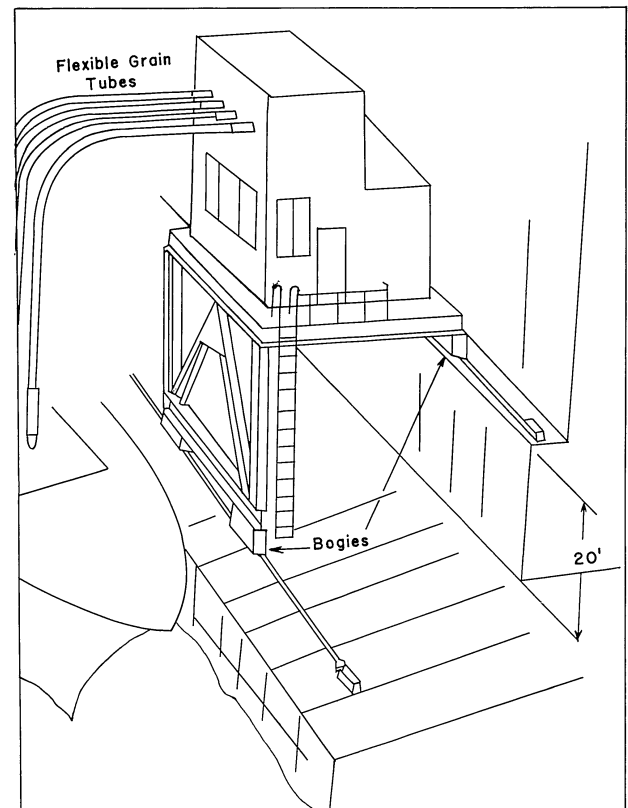
6. Harbors and unimproved sites usable for cargo landing within the port

Between the shipyard piers and the Petroleum Pier there is about 3,800 feet of rough, uneven shoreline with no landing facilities. This area would not be suitable for cargo landing or other amphibious operations in its present state.

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Sketch of grain handling device in use on Quarantine Mole (wharf Ref. 1). Not to scale.

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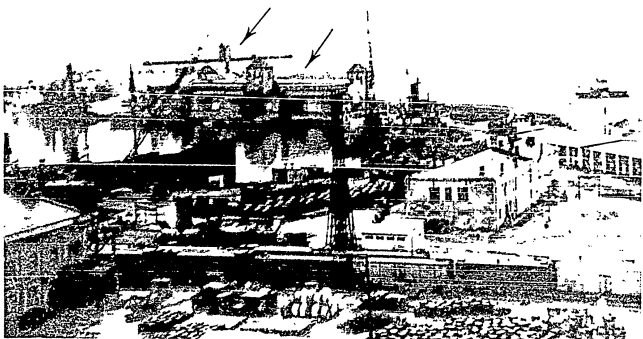
FIGURE 29

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Odessa, USSR



Looking NE from the foot of Quarantine Mole, showing grain handling and storage facilities (arrows) located on wharves Refs. 1 and 3. September 1953



View looking eastward showing grain handling and storage facilities on wharf Ref. 1, at left of photo. ONI 1104310 September 1951

FIGURE 30

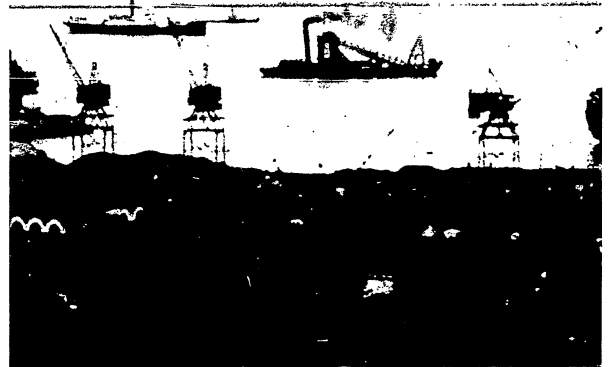
-68-

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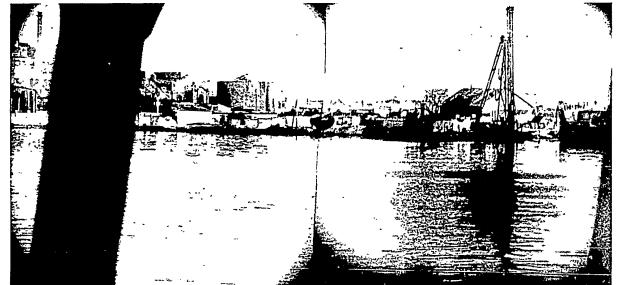
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Looking NE showing bucket-type dredge at work in the Commercial Harbor. 1947



View looking W showing floating piledriver in the Working Harbor, near the northern extremity of the port. Note petroleum storage tank, left center.

April 1955

FIGURE 31

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Odessa, USSR



Looking NE from near the foot of Quarantine Mole showing a portion of the covered storage facilities in the port area. Note variety of goods stored in the open.

September 1953



Looking N showing new warehouse constructed near the foot of Cabotage Harbor Quay.
ONI 490565

February 1951

FIGURE 32

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7. Storage facilities

a. General cargo warehouses

Prior to the German Occupation during World War II, there were 67 buildings in the port area which provided combined covered storage of over 817,000 sq.ft. Most of these structures were damaged or demolished, and many have not been restored. It is believed that the few structures suitable for covered storage are used principally as transit sheds. In 1955 valuable cargo and perishable goods lay on the quays exposed to the weather. The older warehouses were known to be in poor condition.

(Figure 32)

b. Bulk warehouses other than grain and tank storage

No information is available.

c. Cold storage warehouses

One cold storage building is known to be located on Military Mole (wharf Ref. 11). A second has been reported on Cabotage Harbor Quay (wharf Ref. 10). The storage capacities and other details concerning these structures are not available.

d. Tank storage

About 0.5 mile west of the Petroleum Pier (wharf Ref. 16) lies a petroleum tank storage area consisting of 5 groundlevel and 7 underground tanks with a pumphouse and other structures. These tanks have pipeline connections with the Petroleum Pier.

A second tank farm with 31 tanks is located about 1 mile due west of the Marti Shipyard. Information as to the actual storage capacity of these farms or the types of products stored is not available. Six 12- and four 8-inch underground pipelines lead onto the Petroleum Pier. (Figures 33 and 34)

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Odessa, USSR

e. Grain elevators

Two granaries located on Quarantine Mole at wharves Refs. 1 and 3 have a combined storage capacity for about 477,600 bushels. (Figure 30)

The grain storage capacity of the area is augmented by 2 additional elevators storing about 918,500 bushels. These are located some 9 statute miles from Odessa.

f. Open storage

There are approximately 25 acres of space at various locations in the port vicinity adjacent to the piers and quays. Most of these open areas are accessible by rail, and all can be served by truck. A large portion of open space near wharves Refs. 6 to 10 is occupied a good part of the time by coal. (Figures 35 and 36)

g. Clearance facilities

a. Rail

(1) Lines clearing port - Three principal rail lines clear the port of Odessa. One partially double-track line extends northward to Kiev, while a single-track line leads north-eastward to Nikolayev and Kherson. Another rail line extends northwestward to Razdel'naya from which lines extend farther northwestward into USSR, and southwestward across the Rumanian border. One additional rail line leads southwestward from Odessa to Ovidiopol'. Ferry connections eventually extend this line into Rumania. All lines are 5-foot gage.

(2) Rail facilities in port

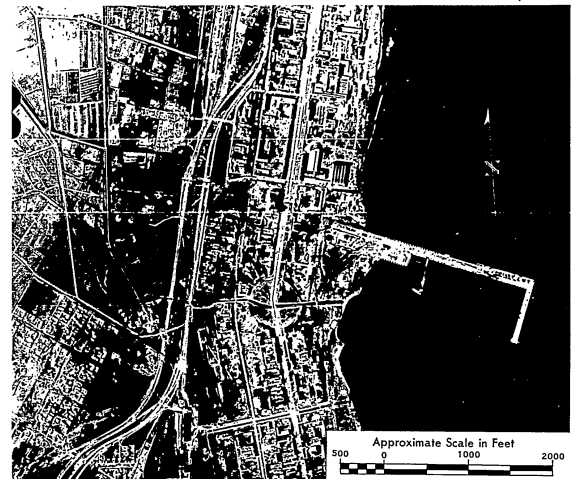
(a) Waterfront and wharves - All quays and piers at Odessa are served by 1 or more rail lines which connect with the cross-country rail system. In most sections of the port

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Aerial view looking N toward Petroleum Pier and tank farm area (arrow). War damage in this area has been repaired. German Aerial May 1944



Looking W from railroad showing portion of petroleum tank farm, W of the Petroleum Pier (wharf Ref. 16) at Odessa.

March 1953

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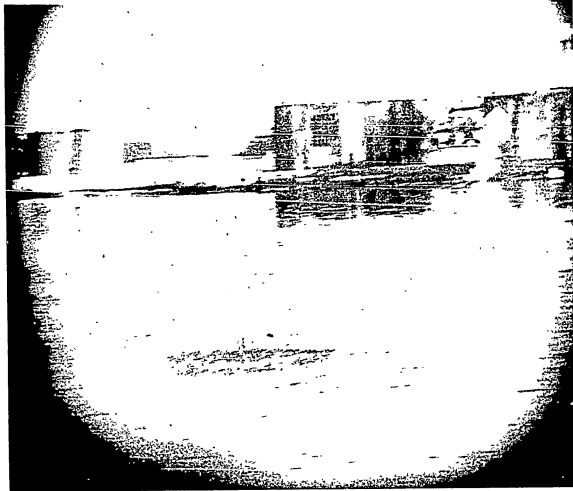
FIGURE 33

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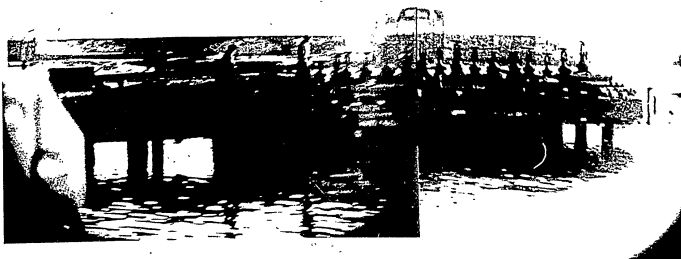
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Odessa, USSR



Looking W toward oil storage tanks near foot of Petroleum Pier (wharf Ref. 16).

April 1955



Looking N showing pipeline connections on Petroleum Pier. Pipelines lead shoreward connecting with pumps and storage tanks.

April 1955

FIGURE 34

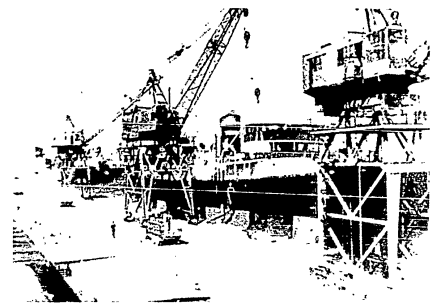
-74-

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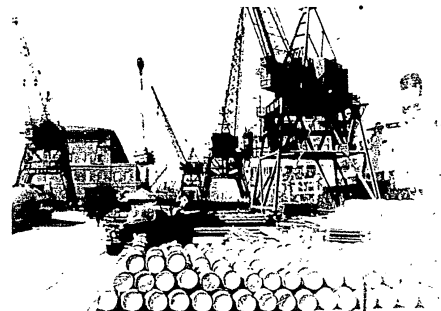
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Looking N along New Harbor Quay (wharf Ref. 8) showing open area at the rear of the quay.

1954



Looking NW along New Harbor Quay showing utilization of space on quay for stacking of packaged products.

1954

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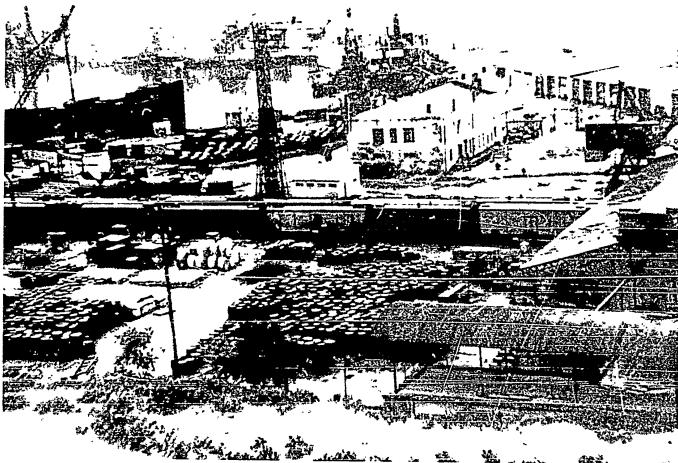
FIGURE 35

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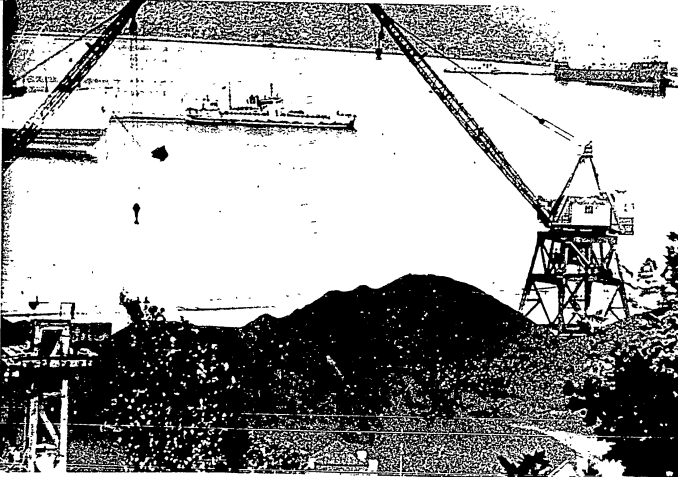
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Odessa, USSR



Looking NE showing open storage area near the foot of Quarantine Mole. September 1953



Looking E showing open storage area adjacent to quays being used to stockpile coal. ONI 1104315

September 1951

FIGURE 36

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Odessa, USSR

the tracks are imbedded flush with the street or decking. However, on some of the piers the tracks are raised above the deck level. (Figure 37)

(b) Classification yards - Three principal classification yards are located at Odessa. The largest is situated in the southern part of the city about 2.5 miles from the port area. The trackage covers a distance of about 1 mile and includes both single- and double-ended track. Since the repair of war damage, the exact number or length of the tracks is not known. The second rail classification yard is located about 0.5 mile west of the Petroleum Pier (wharf Ref. 16) at the north end of the harbor. This yard consists of 6 to 8 single-ended sidings about 2,000 linear feet in average length.

A third yard is located at the western side of the city approximately 2.5 miles from the port. This yard consists of about 7 tracks, 5 of which are a mile or more in length, and all except one are double ended.

In the immediate port area there are a number of double-ended sidings paralleling the waterfront to the rear of wharves Refs. 8 through 14. This yard is 2,300 feet long and 8 tracks wide.

b. Roads

(1) Roads and highways clearing port - Three principal and 3 secondary roads lead out of Odessa. One principal road extends in a northeast direction to Nikolayev. Another extends west about 5 miles, from which 2 secondary roads lead north and west through outlying towns. One eventually leads to Tiraspol'. A third principal highway leads south to Derivasovka, where it becomes a secondary road and continues southwest to Ovidiopol'.

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Odessa, USSR

One secondary road leads northward to Marinovka and Yanovka. Another extends northwest to Razdel'naya and thence northward. The third secondary road extends westward through Belyayevka, Yasska, and Troitskoye.

All principal highways are hard-surface, all-weather roads, 2 lanes or more in width. The secondary roads are loose-surface or dirt roads passable in dry weather.

(2) Streets and roads in town and port area -

Streets and roadways serving the port area are paved, mostly with cobblestone or stone block, and are of sufficient width (about 30 feet) to permit 2-way traffic. There are 4 exits from the port up the grade to the city.

Most of the streets in the city are cobblestone paved and in need of maintenance or repair. Many of the side streets are partially unpaved, and sections of them are impassable in rainy weather. These vary in width from about 16 to 20 feet. The main streets are paved with asphalt and are well maintained. These would probably afford ample clearance from the port through the city. It is believed that there are no bridges or tunnels involved in truck clearance from the port. (Figure 37)

c. Inland waterways

The port of Odessa is not located on the inland waterway network of the USSR.

d. Pipelines

One 9-inch pipeline extends from Odessa southwestward through Galati, Rumania to Ploesti, Rumania, a distance of some 267 statute miles. Information is not available as to the present condition of the petroleum processing plant at Odessa which was heavily damaged during World War II.

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Odessa, USSR



August 1944

Aerial view of the Port of Odessa, looking N. Note rail and road network surrounding the port. German Aerial

CONFIDENTIAL

FIGURE 37

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Looking E across New Harbor Quay (wharf Ref. 8) showing stocks of coal available for bunkering. ONI 1104301

September 1951

FIGURE 38

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Odessa, USSR

9. Ship supplies

a. Fuel

(1) Petroleum products - Fuel oil is available at the Petroleum Pier (wharf Ref. 16) and is supplied on the pier by pipeline from the nearby tank farms. Fuel lighters are also available.

(2) Coal - Large stocks of coal for bunkering are available in quantities ranging up to 20,000 tons. Coal is usually taken on at New Harbor Quay (wharf Ref. 8) or from New Mole Pier (wharf Ref 9). (Figure 38)

b. Utilities

(1) Water - Water of good quality is available at dockside.

(2) Electricity - Electricity is available along the piers and quays. The alternating current at Odessa is 3-phase, 50-cycle, 217/380-volt.

10. Shipbuilding and repair

a. Summary

There are 2 shipyards at Odessa. The Marti Shipyard at the Repair Basin is ranked fourth in the Black Sea area as a producer of new construction, and ranked first as a repair yard for merchant vessels. The yard extends over an area of about 75 acres and has approximately 6,000 feet of water frontage.

A second and smaller yard is located at the foot of Quarantine Mole (wharves Refs. 4 and 5). This yard has no dry-docking facilities and is limited in its operations to above-water ship repairs.

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Odessa, USSR

b. Details of docking installations

At the Marti Shipyard, there are 2 traverse marine railways in the southern section of the repair basin (wharf Ref. 15). Each measures approximately 240 by 150 feet, and consists of some 10 closely laid tracks sloping into the water with a slope of about 10 to 1. The winches, located at the head of the marine railway, are reported to have a combined capacity of 500 tons.

Four slipways, measuring approximately 300 by 50 feet each, are located in the northwestern part of the Repair Basin. These can be used for the construction of small ocean-going ships. Three floating drydocks and possibly 4 are located in the Repair Basin. Details of the 3 confirmed drydocks are listed in the following tabulation:

	No. 1	No. 2	No. 3
Location	NW end of Repair Basin.	NW end of Repair Basin.	NW end of Repair Basin.
Construction	Steel.	Reinforced concrete.	Steel.
Conditional	Operational.	Operational.	Operational.
Length (ft.)	400	300	200
Width (ft.)	80	60	50
Maximum Depth on Keel (ft.)	20	n a	10
Cranes	2 electric jib.	1 electric gantry.	n a
Lifting Capacity (tons)	3,000	2,000	1,000

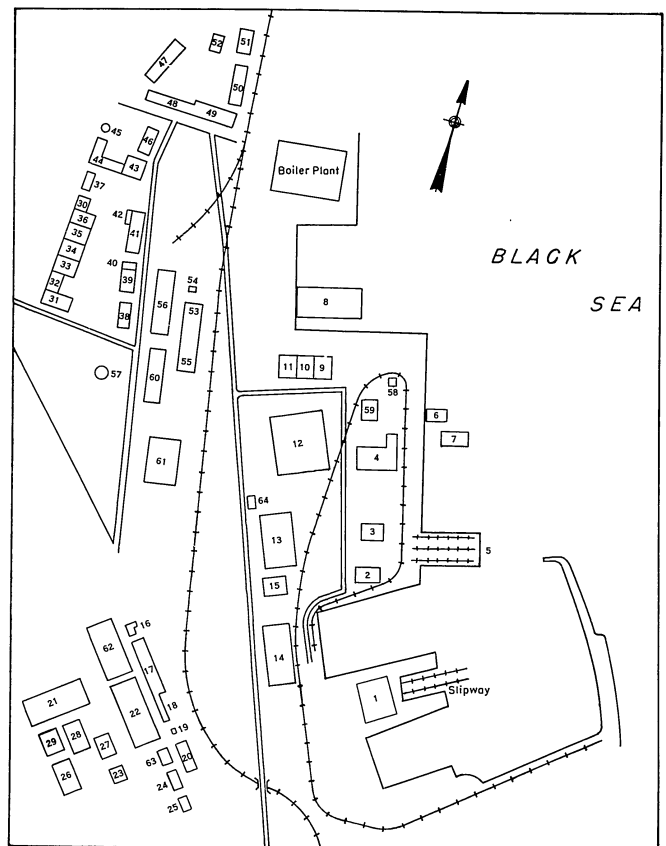
The yard hoisting facilities consist of 3 shipyard-type cranes of about 15 tons capacity each, in addition to locomotive and automotive cranes. There are 2 or more floating cranes in the basin.

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Sketch from observation showing location of shops, buildings, etc. adjoining the Marti Shipyard. Not to scale. See accompanying text.

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FIGURE 39
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Odessa, USSR

b. Details of docking installations

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Width (ft.)	80	60	50
Maximum Depth on Keel (ft.)	20	n a	10
Cranes	2 electric jib.	1 electric gantry.	n a
Lifting Capacity(tons)	3,000	2,000	1,000

The yard hoisting facilities consist of 3 shipyard-type cranes of about 15 tons capacity each, in addition to locomotive and automotive cranes. There are 2 or more floating cranes in the basin.

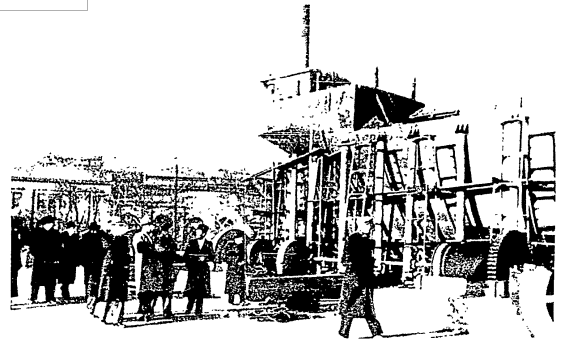
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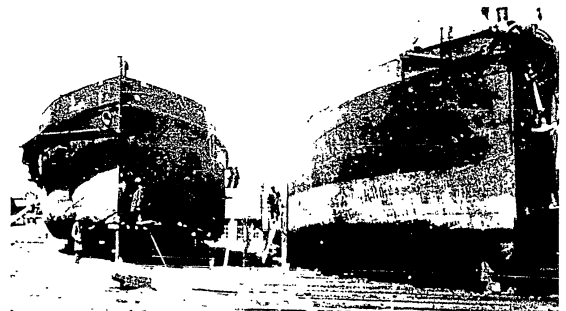


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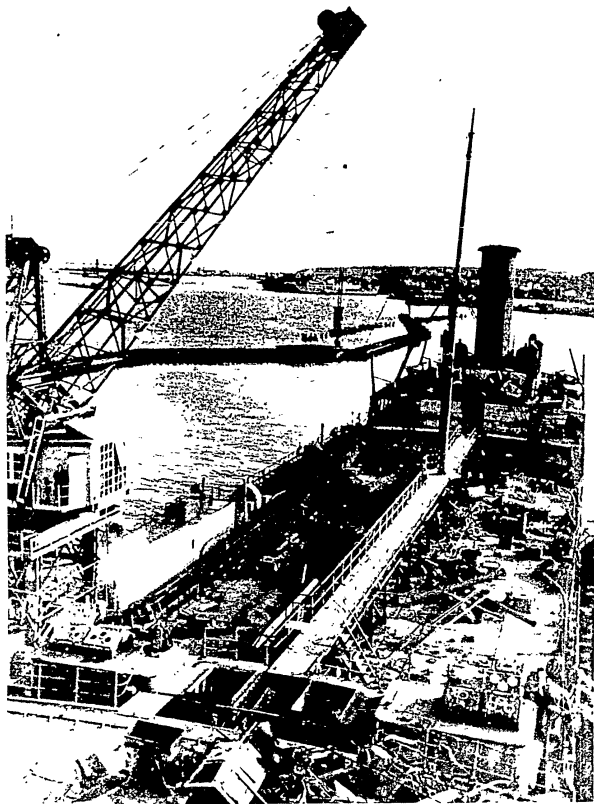
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FIGURE 40
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Upper Left - Panoramic view looking NW toward the Marti Shipyard. Left Center - Looking N showing vessel under construction on one of the transverse railways. Lower Left - Another view of vessels under construction on transverse shipways. Photo above - Looking S at vessel under repair in the largest of the floating drydocks at Odessa.

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Identification of Numerals on Sketch of Marti Shipyard (Figure 39)

1. Hull assembly hall. Three buildings 75 by 30 by 12 of reinforced concrete.
2. Central electric power station. Single story 196 by 65 ft., 3 turbines.
3. Welding shop. Single-story stone structure about 65 by 26 by 19 ft.
4. Machine shop with extension. Single story, brick construction, sheet metal and concrete roof. Approximate dimensions - 164 by 65 by 49 ft. The extension is about 65 by 32 ft. Contained about 30 lathes (2 capable of turning drive shafts up to 50 ft. in length). 4 or 5 milling machines, and 5 drill presses.
5. Ship repair or fitting-out pier with crane. The pier was about 196 by 59 ft. and of concrete construction. A Washington-type crane, with a capacity for about 10 tons, ran on tracks the full length of the pier and about 500 ft. on each side of the pier.
6. Old German drydock. This was about 130 by 63 ft. horizontally, and about 26 to 30 ft. high. It was not in operation in 1951.
7. Self-propelled floating drydock of concrete construction.
8. Stationary floating drydock of steel construction. A crane was mounted on each corner with capacities for about 7 tons each. The floating cranes were used in connection with this dock.
9. One-story assembly hall measuring about 196 by 42 by 39 ft., and constructed of iron with concrete roof. This building contained one large crane and assembly benches. Small parts were assembled here in preparation for final assembly.
10. Mechanical and blacksmith shops. This building was of the same dimensions and construction as 9. The mechanical shop contained an overhead 10-ton crane (American or German), 14 Russian, hand-operated cranes, and 2 Russian circular cranes which were stationary and hand operated. The blacksmith shop contained 4 large furnaces, 6 or 7 small hearths, and 4 pneumatic hammers.
11. Parts manufacturing shop. This was of the same dimensions and construction and adjoined 9 and 10. It contained about 28 stationary cranes of 1.5-ton capacity each, one electric trolley crane of unknown capacity, and an overhead crane with about a 5-ton capacity. There was one 500-ton and two 3-ton metal cutters; also, a plate roller, numerous pneumatic hammers, and 1 American welding machine capable of making 6 simultaneous welding operations.

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12. Yard administration, kitchen, and clubroom. Building 230 by 239 by 38 ft. Two stories, brick construction, with iron and concrete roof. A sheet iron chimney about 65 ft. high was on the W side.
13. Warehouse, about 440 by 39 by 20 ft., 1 story, brick construction, with tile roof. Paint, tools, etc., were stored here.
14. Blacksmith shop. About 278 by 98 by 59 ft. one story, brick construction, iron and concrete roof. Contained 2 overhead electric 5-ton cranes. One 3-ton electric traveling crane was on the outside of the W side of the building. On the roof were 4 or 5 sheet metal chimneys about 65 ft. high.
15. Boilerhouse. About 125 by 125 ft., under construction in May 1949. It was to be used as a heating unit for the area.
16. Mechanical workshop. L-shaped, 1 story, brick building. Contained welding apparatus, 4 to 6 lathes, 1 milling machine, and 2 or 3 drill presses, all new.
17. New iron foundry. About 262 by 118 by 26 ft., 1 story, brick with concrete roof. This building was begun in 1947 and was not in operation in 1949. There were 10 to 12 new furnaces, 3 or 5 with a capacity for 8 tons, and the others about 3 or 5 tons each. Tracks had been installed for 2 cranes, 1 to have a capacity for about 35 tons; the other was smaller. These cranes were not installed in May 1949.
18. Iron foundry. About 196 by 98 by 19 ft., 1 story, brick construction, with brick and tar paper roof, with 2 chimneys about 9 to 13 ft. high on the S side. The foundry contained numerous old furnaces and 1 overhead crane with a 5-ton capacity. Seamless chains were manufactured here.
19. Iron crusher. This consists of a tower about 26 ft. square and about 66 ft. high; it was used to break scrap iron.
20. Bronze and brass foundry. About 196 by 98 by 26 ft., 1 story construction of brick with iron and concrete roof with 3 chimneys about 13 ft. high. This contained 3 Russian-made furnaces and 1 overhead, traveling crane of about 3-ton capacity.
21. Mechanical shop. About 196 by 98 by 26 ft., 1 story, brick construction with brick and tar paper roof. Contained 14 lathes and an American boring and turning machine, 3 or 4 milling machines, and a large planer.
22. Tool and instrument manufacturing shop. About 196 by 98 by 26 ft., 1 story, of brick construction with wood and tar paper roof. This contained 2 or 3 lathes, 2 or 3 capstan lathes and 2 annealing furnaces.
23. New shop about 98 by 49 by 19 ft., 1 story, brick construction, tile roof.
24. Kitchen, mess hall, and bakery. This building was about 131 by 65 by 13 ft., brick construction.

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25. POW billets. About 131 by 39 by 49 ft., 3 stories.
26. Penal camp. About 131 by 39 by 49 ft., 3 stories. A fence separated the penal camp from the rest of the area.
27. Bombed out building.
28. Carpenter and pattern shop. About 32 by 16 by 16 ft., 1 story, brick construction, with brick and tar paper roof. Contained 2 wood lathes, 2 planers and 3 band saws.
29. Lathe department. About 98 by 32 by 16 ft., 1 story, brick construction, with brick and tar paper roof. Contained about 20 new lathes and 2 large drill presses.
30. Carpenter shop. About 49 by 16 ft., 1 story.
31. Lathe shop. About 131 by 49 ft., 1 story. Contained 1 large planer, 3 milling machines, 2 Schepping planers, 1 automatic drill press, 2 regular drill presses, 2 lathes about 26 ft. long, and 5 or 6 other lathes.
32. Carpenter shop, 39 by 39 ft., 1 story.
33. Iron foundry. About 200 by 59 ft., 1 story. Contained 2 furnaces and 1 overhead crane of about 3-ton capacity. This foundry was to be dismantled.
34. Blacksmith shop. About 200 by 59 ft., 1 story. Contained one 3-ton electric hammer and 6 hearths.
35. Shipyard maintenance shop. About 200 by 59 ft., 1 story. Contained 6 welding sets, 4 of which were the 6-outlet type.
36. Electrode and carbide manufacture. About 49 by 26 ft., 1 story. Contained 1 wire cutter and 1 electric oven for making carbide; 220 to 440 lb. of carbide could be produced in 8 hrs. for use in the yard. Additional quantities needed were brought in from Rumania.
37. Garage. Two stories.
38. Electric repair shop. About 59 by 52 by 16 ft., 1 story, used for repair work around the yard. Contained 2 small precision lathes, a drying room for rebuilt electric motors after having been dipped in insulation lacquer, several drills, and an insulation winder.
39. Auto repair shop. About 134 by 32 ft., 1 story.
40. Used oil shop. About 19 by 13 ft. Contained 3 filters through which oil used in vehicles and machinery was filtered and reused.
41. Machine shop. About 131 by 49 ft., 1 story. Contained 4 lathes, 1 planer, 1 automatic drill press, and a locksmith.
42. Transformer house. About 65 by 49 ft.

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- 43-44 Old flour mill (abandoned).
- 45. Church.
- 46. Living quarters.
- 47-52 Large flour mill.
- 53-57 Odessa gas works.
- 58. Workshop for the drydocks.
- 59. Freight transportation office.
- 60. Living quarters.
- 61. Garage.
- 62. New building, use unknown.
- 63. Main gate and guardhouse.
- 64. Use unknown.

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This yard, although chiefly a repair yard, has been producing river barges up to 150 gross tons in size. In 1948 it was producing 40-ton steel river barges at the rate of 3 or 4 per month. In 1949 the monthly rate was increased to 20 barges per month, and two 150-ton barges were built that year. Several have been built since, but the exact number is not available.

The shipyard is served by a large number of well-equipped shops, including plate shops, forges, foundries, machine, assembly, blacksmith, sheet metal, electrical, carpenter, locksmith, and auto repair shops. Most of these are equipped with American and captured German machinery.

Electric power for the shipyard is supplied by 3 steam turbines and coal-fired boilers. Alternating current is distributed throughout the yard at 220 volts for lighting and 380 volts for power. Three diesel railroad generators are stationed in the shipyard and are used as an auxiliary source of power. Also, the system is connected to the municipal power station in Odessa. In addition, many of the shops and industries have their own plants to augment the power from the shipyard plants.

Steam is provided to operate the forge hammers and to heat the main shipyard buildings. Compressed air is provided by underground pipe from a building housing 4 compressors. Oxygen, mainly used for welding is bottled in a plant near the west wall of the shipyard. (Figures 39 and 40.)

11. Planned development and improvements

No details are available as to planned development or improvements at the port. Most of the war damage to the piers and quays has been repaired. Indefinite reports have indicated an intention to expand the grain handling facilities by improving

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the area between the shipyard and the Petroleum Pier. Present information does not indicate that such improvements have been made.

12. Potentialities for expansion

a. Summary

The port's military discharge capacity can be increased about 3,800 long tons per 20-hour day or 20 percent, of which 1,300 tons can be accomplished under Phase I, and 2,500 tons under Phase III.

b. Phase I - Suggested repairs to existing facilities

Under this phase repairs along the northwest side of Military Mole (wharf Ref. 11) could provide about 1,300 additional feet of usable berthing space. This would involve the reconstruction of the pier wall and the removal of the stone blocks now forming an embankment. Minor dredging also might be required along this section of the pier. In addition, minor dredging should be performed along the face of Cabotage Harbor Quay (wharf Ref. 10), Apuznaya Quay (Ref. 12), and Androsovski Mole (Ref. 13), in order to provide a minimum depth of 18 feet for the entire length of these structures, a distance of some 3,375 feet. This latter dredging along the quay faces would not in itself increase the discharge capacity appreciably. However, it would provide considerably more alongside berthing for deeper draft, oceangoing vessels.

c. Phase II - Suggested major improvements, additions, and extensions to existing facilities

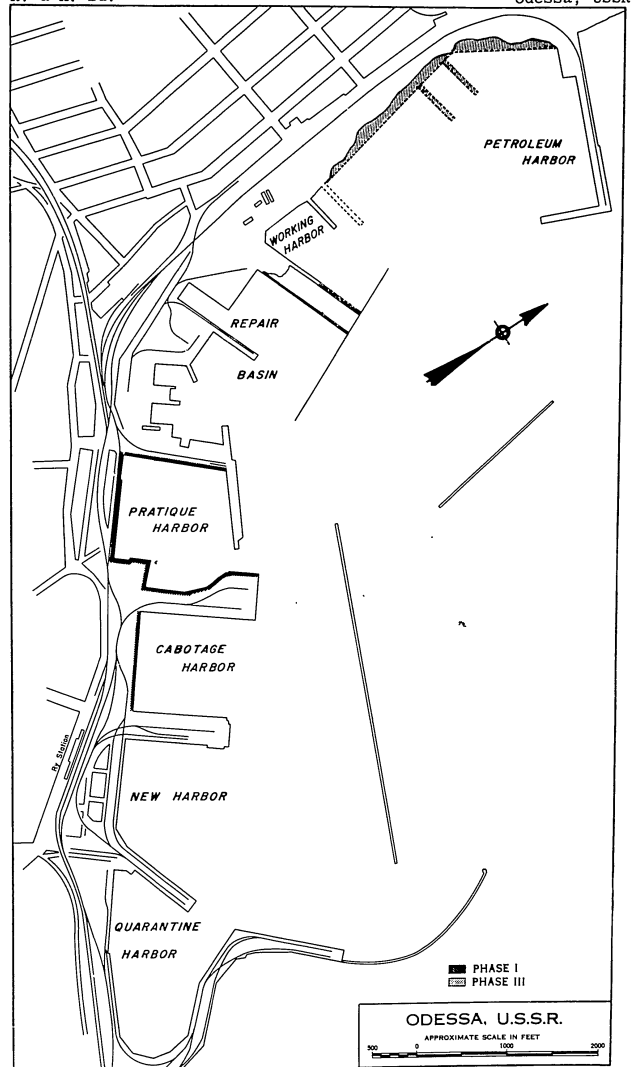
Owing to the layout of the existing piers and quays at Odessa, additions or extensions thereto would be impractical. However, the construction of transit sheds on the piers and quays, and additional warehouses within close proximity of the port are

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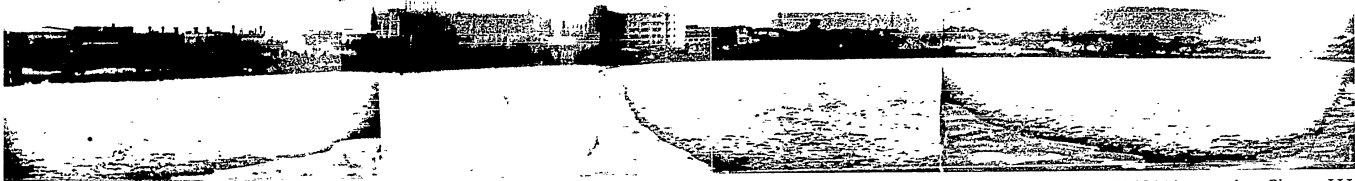
Plan of the Port of Odessa showing the location of phased potentialities for expansion.

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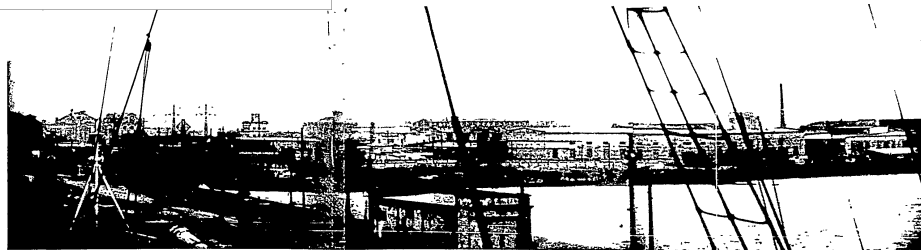
Looking W at shoreline in Odessa Harbor N of the Marti Shipyard. This section of the port has potential expansion possibilities under Phase III, by dredging and the construction of piers and wharves.

April 1955



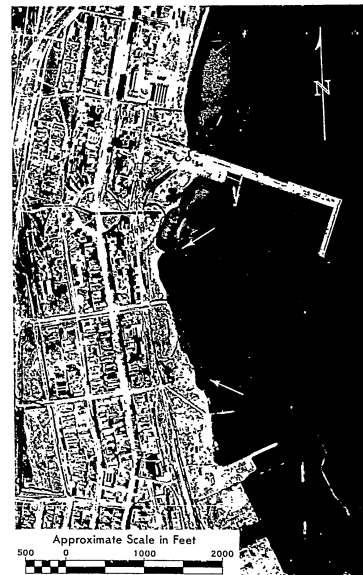
View looking westward showing the shoreline S of the Petroleum Pier (wharf Ref. 16). Note foul water area inshore which would have to be cleared by dredging if berthing facilities were provided at this location.

April 1955



Looking NW toward the shoreline from the Petroleum Pier. Due to congestion in the shore area and lack of offshore protection, it is considered impractical to construct berthing facilities at this location.

April 1955



Aerial view showing unimproved shoreline S of the Petroleum Pier. War damage shown here has been repaired. German Aerial August 1944

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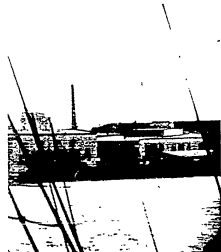
of the port has potential expansion possibilities under Phase III.

April 1955



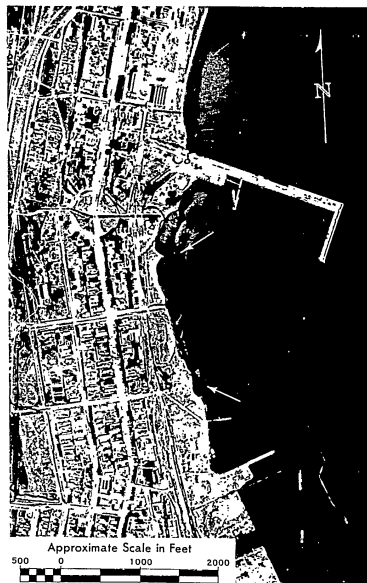
f. 16). Note foul facilities were provided

April 1955



a the shore area and wharf facilities at this

April 1955



Aerial view showing unimproved shoreline S of the Petroleum Pier. War damage shown here has been repaired. German Aerial August 1944

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badly needed. At present, covered storage is seriously short and perishable cargo is subject to weather damage.

d. Phase III - Suggested locations of new piers or wharves

Between the shipyard and the Petroleum Pier (wharf Ref. 16), the unimproved shoreline is fringed by shoal water ranging in depth from 2 to 7 feet. By constructing permanent-type quays along the shore for a distance of some 2,000 feet, and 2 or more offshore wharves 500 feet or more in length, with the necessary dredging, about 2,500 feet of usable berthing space could be provided under this phase. This would involve a major dredging operation in order to provide a minimum depth of 12 to 15 feet over the area. It should be noted that this location is the only unimproved site within the confines of the present port limits.

To attempt to extend the port to the north beyond the Petroleum Pier would be economically unsound owing to the more extensive dredging necessary and the lack of offshore protection.

The area south of the Petroleum Pier has access roads and rail lines nearby and clearance would not be a problem. (Figures 41 and 42)

13. Construction data.

a. Availability of construction materials

Odessa is located in a nonforested zone; the climate is unsuitable for the growth of forests. The few trees in the area grow only along streams and are of the fast-growing broad-leaf type furnishing poor quality timber.

Both sand and gravel deposits are abundant in the vicinity of Odessa, and many were worked for construction

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materials prior to 1935. Sand and gravel also can be found along most stream beds.

From quarries located slightly to the west of Odessa, limestone, dolomite, and marble were obtained up to 1935. These are readily accessible and in good quality for construction work.

b. Weather and climatic factors affecting construction

Odessa has a mean air temperature of 50°F., a maximum of 95°F., and a minimum of minus 19°F. The mean relative humidity is 75 percent. The average annual rainfall totals 15.24 inches falling on 91 days. North winds prevail in the area occurring on 59 days of the year, with fog occurring on 45 days. Occasionally, fogs last several days.

The spring range of tides is 0.4 foot and the neap range is 0.1 foot. Atmospheric pressure and winds may cause variations in the water level of as much as 4.0 feet.

Ice conditions vary with the severity of the winter, but ice usually occurs from December to March.

Wave force at Odessa reaches about 52 tons per square foot.

c. Labor and craftsmen factors

In 1955, labor was reported as being in short supply at Odessa and not efficient. Fully 60 percent of the dockworkers were women; the labor pool was estimated at 5,000. Information is not available regarding craftsmen factors.

d. Foundation conditions

The Odessa area is overlain by tertiary and quaternary glacial till and loam. Under these deposits, limestone beds overlie sandstone with limestone lenses. The base complex of granite rocks is found at a depth of approximately 300 feet.

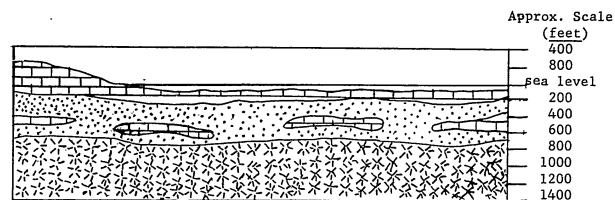
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Bottom sediments consist chiefly of mud with a layer of sand along the shore. The following clearly portrays these subsurface conditions.



Legend
Geology

- Sandstone
- Limestone
- Granite

e. Water supply

Odessa lies in a semiarid region of perennial streams which are as much as 20 miles apart. The majority of the streams are dry in August and September. Fair to excellent water-bearing sands and gravels are present in the area. The water commonly is hard and saline, but otherwise of good chemical quality.

The main pumping station lies 2 miles southwest of Quarantine Mole (wharves Refs. 1 through 4). It consists of a landscaped area with 10 buildings and 5 covered reservoirs. The total reservoir area covers 206,750 sq.ft. and consists of 1 building 460 by 260 ft., one 205 by 150 ft., one 180 by 120 ft., and two 145 by 120 ft.

A second pumping station is located about 0.5 mile west of the Petroleum Pier (wharf Ref. 16). Prior to World War II water was pumped into Odessa from a reservoir located on the

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western shore of White Lake (Ozero Beloye), about 25 miles west of the city. Severe war damage to the water supply system necessitated the development of supplemental sources.

In 1951 potable water from a filtration plant on the Dniester River at Belyayevka, 24 miles west, was piped to the port area. This water was suitable for boilers, but occasionally the salinity ran as high as 16 grains.

Although it is not known whether all war damage to the water system has been repaired, recent reports state that potable water under low pressure is available at all berths.

f. Electric power

The principal source of electricity at Odessa is a 40,000-kilowatt-capacity thermal plant located about 2,000 feet northwest of the foot of the Petroleum Pier. This plant produces alternating current at 3-phase, 217/380-volt. It is supplemented by smaller thermal plants in the city. In addition many of the factories, as well as the Marti Shipyard, have their own electric plants. Although there are occasional current failures at Odessa, it is believed that sufficient current for construction purposes is available. (Figure 43)

The generator which supplies power for the cranes at the port is located at the rear of Bakalanya Quay (wharf Ref. 6).

g. Coal

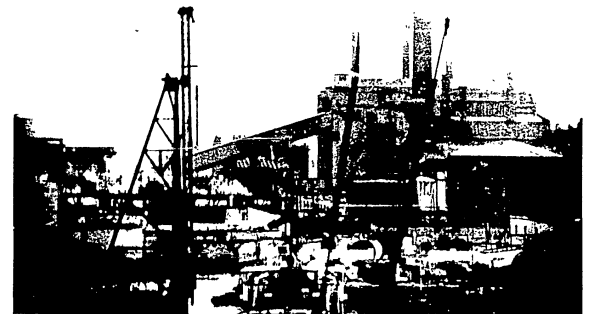
Stocks of 15,000 to 20,000 tons of coal are normally available at the port for bunkering purposes. Although information as to the quality of this fuel is not available, much of it should be usable for construction purposes.

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View of thermal electric plant at Odessa, looking W. The output of this plant is supplemented by those of smaller plants in the port area.

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FIGURE 43

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14. Points of vulnerability in the port area

The points of vulnerability are listed below and are shown on Figure 44:

- (1) The 2 main harbor entrances between the breakwaters. The closing of these entrances would effectively close the port to all oceangoing traffic.
- (2) The Marti Shipyard located near the center of the port area. The destruction of this yard would eliminate the largest ship repair yard in the area, and the fourth in size and importance on the entire Black Sea.
- (3) The petroleum storage tanks at the northern extremity of the port. The destruction of these tanks would materially reduce the storage capacity at Odessa.
- (4) Rail classification yards. The destruction of the 3 principal classification yards at Odessa would seriously curtail rail clearance from this port.
- (5) The power generating plants. The destruction of the 2 principal power plants in the port area, which are located a short distance inland from the Petroleum Pier (wharf Ref. 16), would hinder port operations even though some current could be obtained from low capacity plants in the area.

15. Comments on principal sources

The information used in compiling this study was obtained mainly from material located in the Washington area. Chart 4202 published by the U. S. Hydrographic Office was the principal source of depths in the harbor area. Coverage by both aerial and ground photography is considered poor for the purpose of this study, particularly in the northern part of the port area including the Marti Shipyard.

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In general, the available information is adequate for broad briefing purposes, but is lacking in the detailed requirements of engineer intelligence. Construction details of wharves, storage, and repair facilities are meager. Specific information on the degree of silting in the harbor and the amount and frequency of maintenance dredging cannot be determined from available data. The lack of up-to-date material makes it impossible to state the present condition of many of the port facilities, and the estimated unloading military capacity of the port as indicated herein may be slightly lower than that which can be handled at the present time.

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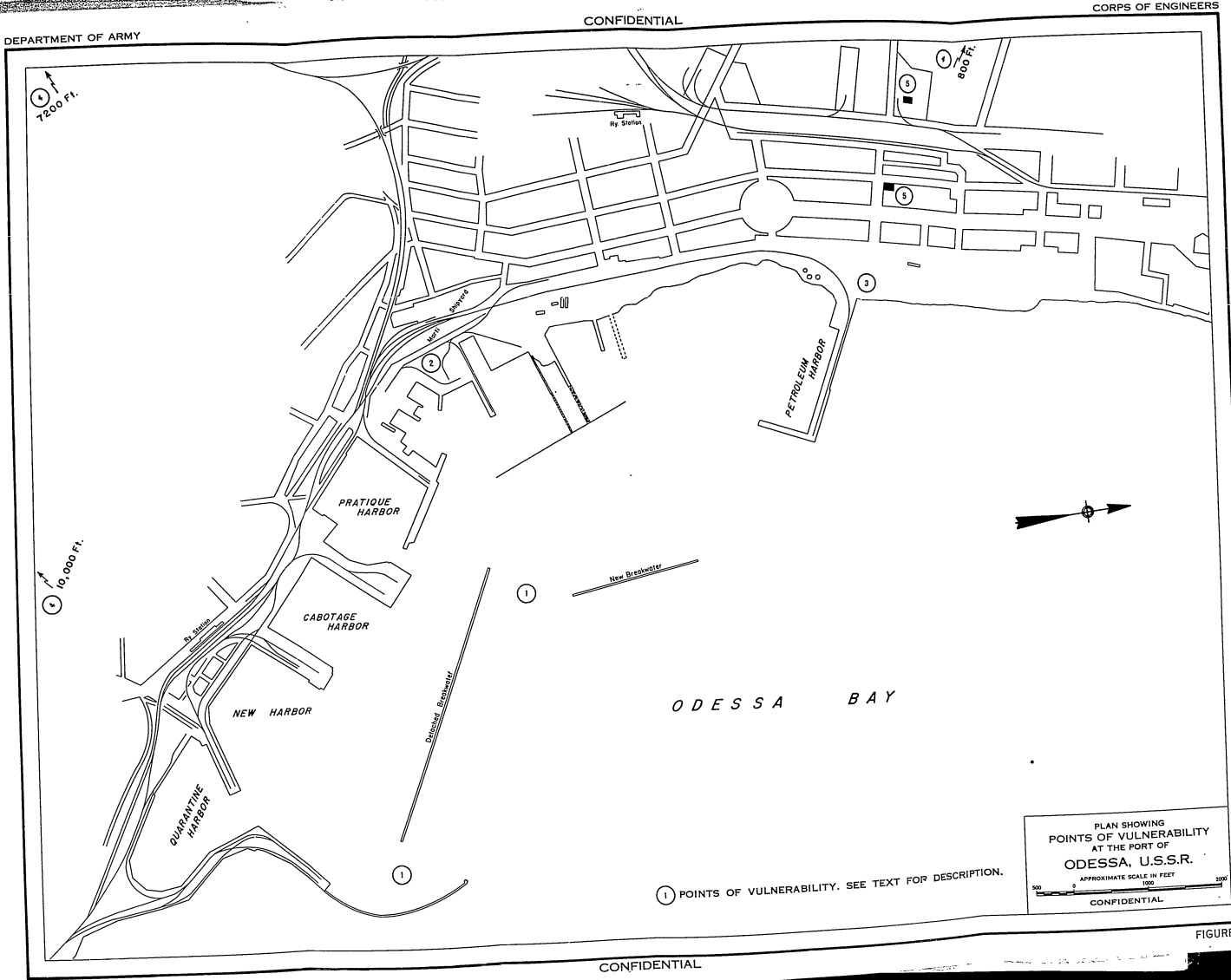


FIGURE 44

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SUMMARY OF PORT FACILITIES

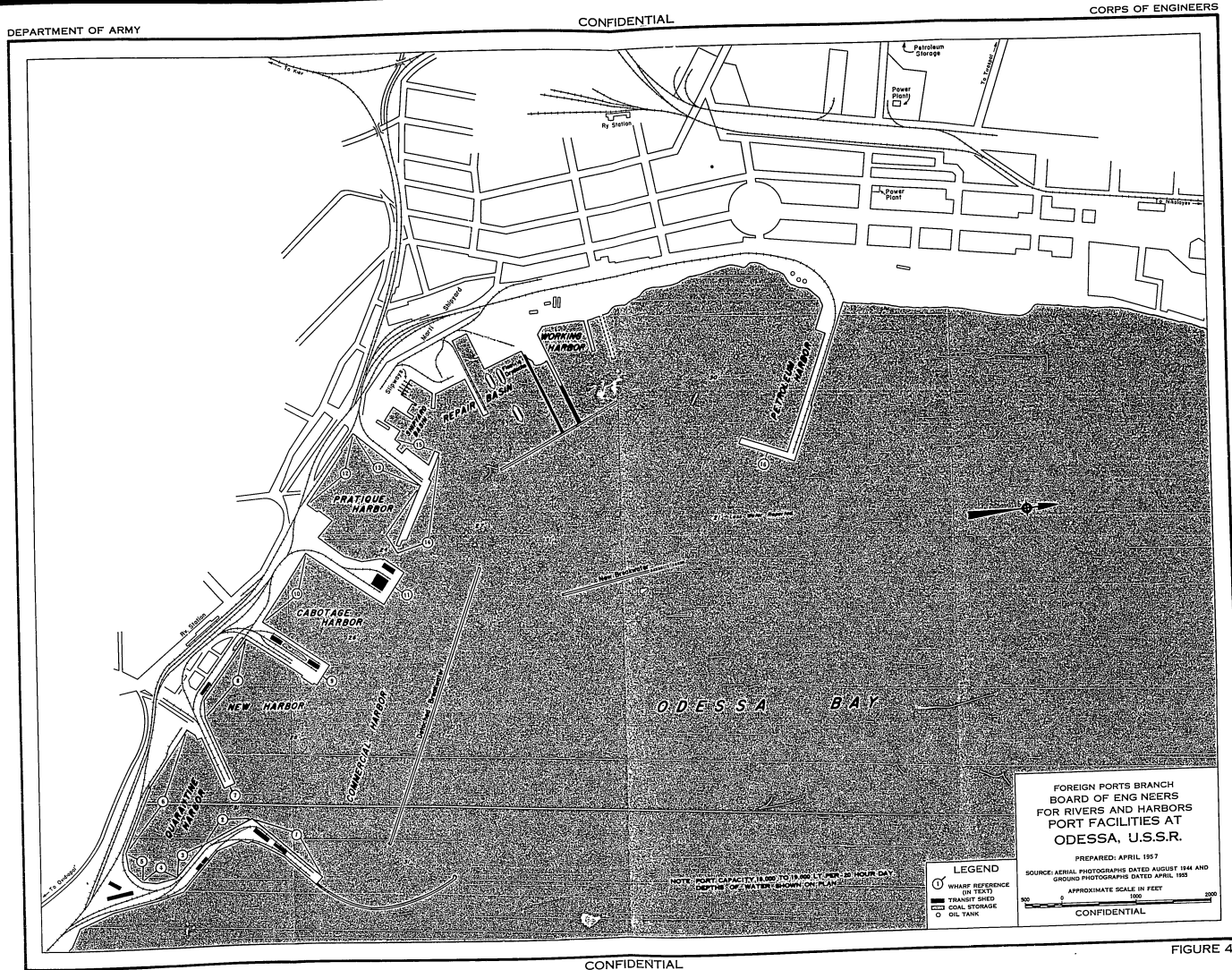
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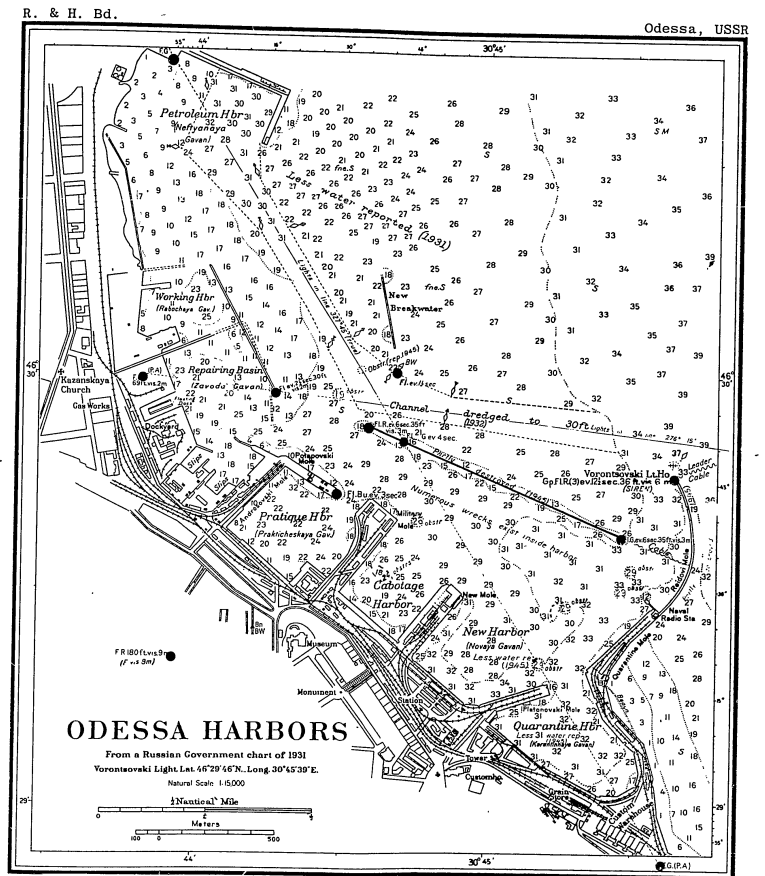
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HARBOR AND ENTRANCES	ESTIMATED MILITARY PORT CAPACITY	CLEARANCE FACILITIES	PLANNED DEVELOPMENT AND IMPROVEMENTS																																					
<p>Harbor Odessa harbor is artificial and lies in the SW part of Odessa Bay. It is protected by a series of breakwaters. Approach to the port is from the SE and E, through the Black Sea, into Odessa Bay. Navigational dangers are plainly marked.</p> <p>Entrances There are 3 entrances to the port: 2 to the main or S part of the harbor, and 1 to the Petroleum Harbor. The S entrance is made between Revidol Mole and the SE end of a long, detached breakwater. The width is about 1,050 ft. and the controlling depth 31 ft.</p> <p>The second entrance is from the E, between the N end of the detached breakwater and the S end of a T-shaped breakwater lying to the N. There is a width of 1,400 ft. at this entrance and a controlling depth of 27 ft. The approach to this entrance has been dredged to 30 ft. with a least width of 400 ft.</p> <p>The third entrance leads to the N end of the port, Petroleum Harbor. The dredged channel from the S leads to a point near the N end of the detached breakwater. A NW channel leads into Petroleum Harbor. This dredged channel has a controlling depth of 30 ft. for a width of 350 ft. Pilotage is compulsory.</p>	<p>The military unloading capacity is estimated to range between 18,000 and 19,000 long tons/20-hr. day. A phased study of the expansion possibilities indicates that the capacity could be increased about 3,800 tons.</p> <p style="text-align: center;">MECHANICAL HANDLING FACILITIES</p> <p style="text-align: center;">Cranes ashore and afloat</p> <table border="1"> <thead> <tr> <th>Number</th> <th>Capacity (tons)</th> <th>Type</th> <th>Power</th> </tr> </thead> <tbody> <tr> <td>30</td> <td>7 to 15</td> <td>Portal jib</td> <td>Electric</td> </tr> <tr> <td>30</td> <td>1.5 to 3</td> <td>Crawler</td> <td>Diesel</td> </tr> <tr> <td>1</td> <td>20</td> <td>Shearlegs derrick</td> <td>n a</td> </tr> <tr> <td>1</td> <td>150</td> <td>Floating</td> <td>n a</td> </tr> <tr> <td>1</td> <td>20</td> <td>do</td> <td>n a</td> </tr> <tr> <td>1</td> <td>20</td> <td>do</td> <td>n a</td> </tr> <tr> <td>1</td> <td>2</td> <td>do</td> <td>n a</td> </tr> <tr> <td>1</td> <td>n a</td> <td>Floating shearlegs</td> <td>n a</td> </tr> </tbody> </table> <p style="text-align: center;">Specialized handling equipment</p> <p>There are 2 multiple-spooned grain conveyors, and 1 or more floating grain spouts on Quarantine Mole.</p>	Number	Capacity (tons)	Type	Power	30	7 to 15	Portal jib	Electric	30	1.5 to 3	Crawler	Diesel	1	20	Shearlegs derrick	n a	1	150	Floating	n a	1	20	do	n a	1	20	do	n a	1	2	do	n a	1	n a	Floating shearlegs	n a	<p>Rail Three principal lines clear the port: 1, partly double tracked, extends N to Kiev, then single tracks NE to Nikolayev and Kherson; another extends NW to Huzdolynya; the third leads SW to Ovidiopol. Ferry connections extend this line into Rumania. All are 5-ft. gage. All quays and piers at the port are served by 1 or more rail lines which form a part of the rail network. In most sections of the port the tracks are set flush with the street or decking.</p> <p>There are 3 principal classification yards at Odessa. The largest is located about 2.5 miles from the port area in the S part of Odessa. The second yard is located about 0.5 mile W of the Petroleum Pier at the N end of the harbor. A third yard is in the W part of the city about 2.5 miles from the port.</p> <p>Three principal and 3 secondary roads lead out of Odessa. One principal road extends NE to Nikolayev; 1 extends W about 5 miles and branches into 2 secondary roads leading N and W through outlying towns; and 1 extends S to Deribasovka. One secondary road leads N to Marinovka and Yanovka. 1 extends NW to Razdel'naya; and 1 leads W through Belyayevka, Yaseki, and Troitskoye. The principal roads are hard surface, all-weather roads, 2 lanes or more in width. The secondary roads are loose surface or dirt, passable in dry weather. The streets and roads serving the port area are cobblestone or stone block and are of sufficient width to permit 2-way traffic. There are though most city streets are cobblestone, they are generally in need of maintenance and repair. The main streets are paved with asphalt and are well maintained. It is believed that ample truck clearance is available from the port.</p> <p>Inland waterways Odessa is not located on the inland waterway network of the USSR.</p> <p>Pipelines One 18-inch pipeline extends SW through Galati, Rumania to Ploesti, Rumania, a distance of about 267 miles.</p>	<p>Available information does not indicate any specific plan for improving or expanding the port. Within recent years efforts toward port improvement have been limited to the repair of war damage.</p> <p style="text-align: center;">POTENTIALITIES FOR EXPANSION</p> <p>The port's military discharge capacity can be increased about 3,800 long tons per 20-hour day or 20 percent of which 1,300 tons can be accomplished under Phase I, and 2,500 tons under Phase III.</p> <p style="text-align: center;">CONSTRUCTION DATA</p> <p>Availability of construction materials Sand and gravel for construction work are abundant in the area, as are limestone, dolomite, and marble. Timber is scarce. Weather and climatic factors affecting construction</p> <p>There is a mean air temperature of 50°F., a maximum of 90°F., and a minimum of minus 19.0°F. Mean relative humidity is 75 percent. Rainfall totals 15.24 inches annually, falling on 91 days. North winds prevail, and fog occurs on 45 days. Wave force reaches about 52 tons/sq. ft. at Odessa. Tides are negligible.</p> <p>Labor and craftsmen factors In 1955 labor was in short supply, and fully 80 percent of the dockworkers were women. The labor pool was estimated at 5,000.</p> <p>Foundation conditions Odessa is overlain by tertiary and quaternary glacial till and loam. Under these deposits limestone beds overlie sandstone. The base complex of granite rocks is found at a depth of about 600 ft. Bottom sediments consist chiefly of mud with a layer of sand along the shore.</p> <p>Water supply LIMITED quantities of water suitable for use in construction work are believed to be available in the area.</p> <p>Electric power It is believed that sufficient alternating current for construction purposes is available at 3-phase, 50-cycle, 380-volt.</p> <p>Coal Stocks of 15,000 to 20,000 tons of coal are normally available at the port for bunkering. Although information as to the quality of this coal is not available, it is believed that such of it should be usable for construction work.</p>	
Number	Capacity (tons)	Type	Power																																					
30	7 to 15	Portal jib	Electric																																					
30	1.5 to 3	Crawler	Diesel																																					
1	20	Shearlegs derrick	n a																																					
1	150	Floating	n a																																					
1	20	do	n a																																					
1	20	do	n a																																					
1	2	do	n a																																					
1	n a	Floating shearlegs	n a																																					
<p>Unlimited anchorage is available 0.5 mile NE of the head of Revidol Mole in 35 to 45 ft. over sand and mud, exposed to the E. Moorings for 3 or 4 Class A-type vessels are available from buoys inside the detached breakwater.</p>	<p style="text-align: center;">PORT MAINTENANCE AND ENGINEER EQUIPMENT Afloat</p> <p>In 1955 there were 12 harbor tugs located at the port ranging up to 2,000 hp. There are also 1 bucket dredge, 1 suction dredge, 2 self-propelled barges, and 10 or more dumb barges. Two or 3 pilddrivers are based at Odessa, and an undetermined number of icebreakers. One large salvage vessel was working off the port in 1952.</p>	<p style="text-align: center;">SHIPS SUPPLIES</p> <p>Fuel Petroleum Fuel oil is available on the Petroleum Pier, supplied by pipelines from the nearby tank farm. Fuel lighters are also available.</p> <p>Coal Quantities ranging up to 20,000 tons are available for bunkering. Coal is usually taken on at New Harbor Quay, or New Mole Pier.</p> <p>Water Water of good quality is available at dockside.</p> <p>Electricity Electricity is available along the piers and quays. The alternating current is 3-phase, 50-cycle, 217/380 volts.</p>	<p style="text-align: center;">POINTS OF VULNERABILITY</p> <p>The points of vulnerability are the 2 main harbor entrances, Marti Shipyards, petroleum storage tanks, rail classification yards, and the power generating plants. The destruction of these would seriously affect port operations.</p>																																					
<p style="text-align: center;">HYDROGRAPHIC CONDITIONS AFFECTING NAVIGATION</p> <p>Tides are negligible in the area. The spring range is 0.4 ft., the mean range 0.2 ft., and the neap range 0.1 ft. Strong E winds have raised the water level 2 ft. above normal, while NE winds may lower it a like amount. Navigation is maintained throughout the winter by the use of icebreakers.</p>	<p style="text-align: center;">HARDS AND UNIMPROVED SITES USABLE FOR CARGO LANDING WITHIN THE PORT</p> <p>A stretch of rough, uneven shoreline about 3,800 ft. in length extends N from the shipyard piers to the vicinity of the Petroleum Pier. In its present state this area would not be suitable for amphibious operations.</p>	<p style="text-align: center;">SHIPBUILDING AND REPAIR</p> <p>There are 2 shipyards at Odessa. The larger, the Marti Shipyards, is located at the repair basin, extends about 75 acres, and has about 6,000 ft. of waterfront. A second smaller yard is located at the foot of Quarantine Mole. This yard has no drydocking facilities, and is limited to above-water ship repairs.</p> <p>At the Marti Shipyards there are 2 traverser marine railways, 4 slipways, and 3 or possibly power plant, shipyard cranes, and other equipment for the construction of small ocean-going vessels and various types of river craft.</p>	<p style="text-align: center;">GENERAL REMARKS</p> <p>Located near the NW extremity of the Black Sea, Odessa is the principal USSR port for this rich agricultural area, including the Ukraine. It is also a minor naval base. Exports include grain, coal, ores, lumber, and processed iron as well as trucks and other agricultural and industrial machinery consigned to satellite countries. Imports include machinery, rubber, wool, cork, crude petroleum, olive oil, sugar, seed oil, and other foodstuffs. Extensive World War II damage to port facilities has been repaired. The city, which adjoins the port on the W and S, is located on high ground which slopes steeply toward the waterfront. The estimated population was 625,000 in January 1955.</p>																																					
<p style="text-align: center;">WHARVES</p> <p style="text-align: center;">General Cargo</p> <table border="1"> <thead> <tr> <th>Usable Berthing Space (feet)</th> <th>Depths (feet)</th> </tr> </thead> <tbody> <tr> <td>5,115</td> <td>25 and over</td> </tr> <tr> <td>6,815</td> <td>18 to 25</td> </tr> <tr> <td>4,890</td> <td>12 to 18</td> </tr> <tr> <td>1,525</td> <td>5 to 12</td> </tr> <tr> <td>18,345</td> <td></td> </tr> </tbody> </table> <p style="text-align: center;">Petroleum</p> <table border="1"> <thead> <tr> <th>Capacity</th> <th>Depths</th> </tr> </thead> <tbody> <tr> <td>1,900</td> <td>17</td> </tr> </tbody> </table> <p style="text-align: center;">Grain</p> <table border="1"> <thead> <tr> <th>Capacity</th> <th>Depths</th> </tr> </thead> <tbody> <tr> <td>600</td> <td>21</td> </tr> </tbody> </table> <p style="text-align: center;">Ship Repairs</p> <table border="1"> <thead> <tr> <th>Capacity</th> <th>Depths</th> </tr> </thead> <tbody> <tr> <td>450</td> <td>17 to 25</td> </tr> </tbody> </table> <p style="text-align: center;">Vessel Accommodation</p> <table border="1"> <thead> <tr> <th>No.</th> <th>Class</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>A</td> </tr> <tr> <td>11</td> <td>B</td> </tr> <tr> <td>14</td> <td>C</td> </tr> <tr> <td>19</td> <td>D</td> </tr> <tr> <td>13</td> <td>Lighters</td> </tr> <tr> <td>9</td> <td>T-D tankers</td> </tr> </tbody> </table> <p>Note - The lighters can service 1 Class A- and 2 Class B-type vessels moored in the harbor</p>	Usable Berthing Space (feet)	Depths (feet)	5,115	25 and over	6,815	18 to 25	4,890	12 to 18	1,525	5 to 12	18,345		Capacity	Depths	1,900	17	Capacity	Depths	600	21	Capacity	Depths	450	17 to 25	No.	Class	10	A	11	B	14	C	19	D	13	Lighters	9	T-D tankers	<p style="text-align: center;">STORAGE FACILITIES</p> <p>General cargo warehouses These are inadequate in the port area. Available buildings are used mostly as transit sheds. Total capacity - n a.</p> <p>Bulk warehouses other than grain and tank storage No information is available.</p> <p>Cold storage warehouses One cold storage building is located on Military Mole, and a second has been reported on Cabotage Harbor Quay. Capacities - n a.</p> <p>Tank storage 43 tanks, some underground, are located within 1 mile radius of the port. Capacities and types of products - n a.</p> <p>Grain elevators Two granaries on Quarantine Mole have a combined capacity for 477,900 bu. Two additional elevators about 9 miles from Odessa store about 218,500 bu.</p> <p>Open storage About 25 acres in the port area accessible by rail and road.</p>	<p style="text-align: center;">POINTS OF VULNERABILITY</p> <p>The points of vulnerability are the 2 main harbor entrances, Marti Shipyards, petroleum storage tanks, rail classification yards, and the power generating plants. The destruction of these would seriously affect port operations.</p>
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TABLE IV





H. O. Chart 4202 (Inset).

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