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19 June 2003

UNIFIED FACILITIES CRITERIA (UFC)

DRYDOCKING FACILITIES CHARACTERISTICS

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UNIFIED FACILITIES CRITERIA (UFC)

DRAFT DRYDOCKING FACILITIES CHARACTERISTICS

U.S. ARMY CORPS OF ENGINEERS

NAVAL FACILITIES ENGINEERING COMMAND (Preparing Activity)

AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

Record of Changes (changes are indicated by **1**\ ... /**1**/)

Change No.	Date	Location

FOREWORD

The Unified Facilities Criteria (UFC) system is prescribed by MIL-STD 3007 and provides planning, design, construction, sustainment, restoration, and modernization criteria, and applies to the Military Departments, the Defense Agencies, and the DoD Field Activities in accordance with USD(AT&L) Memorandum dated 29 May 2002. UFC will be used for all DoD projects and work for other customers where appropriate.

UFC are living documents and will be periodically reviewed, updated, and made available to users as part of the Services' responsibility for providing technical criteria for military construction. Headquarters, U.S. Army Corps of Engineers (HQUSACE), Naval Facilities Engineering Command (NAVFAC), and Air Force Civil Engineer Support Agency (AFCESA) are responsible for administration of the UFC system. Defense agencies should contact the preparing service for document interpretation and improvements. Technical content of UFC is the responsibility of the cognizant DoD working group. Recommended changes with supporting rationale should be sent to the respective service proponent office by the following electronic form: Criteria Change Request (CCR). The form is also accessible from the Internet sites listed below.

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- NAVFAC Engineering Innovation and Criteria Office Internet site http://criteria.navfac.navy.mil.
- Construction Criteria Base (CCB) system maintained by the National Institute of Building Sciences at Internet site http://www.nibs.org/ccb.

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INTRODUCTION

1-1 **SCOPE**. This UFC presents drydocking facilities characteristics in tabular and figure form for graving drydocks, marine railways and lifts. Plans are also presented indicating the locations of drydocking facilities in naval shipyards or other naval shore installations.

1-1.2 NAVFAC and the Naval Facilities Engineering Service Center are also developing a Drydock Characteristics Database that will provide the necessary data for drydock certification.

1-2 **CANCELLATION**. UFC 4-213-12, *Drydocking Facilities Characteristics*, cancels and supersedes MIL-HDBK-1029/3, *Drydocking Facilities Characteristics*, of 30 September 1988.

1-3 FACILITIES CHARACTERISTICS SUMMARY

1-3.1 **Tabular Data**. Table 1 presents active graving drydock, marine railway and lift general locations, facility number designation, size, depth of water, tide range, and types of vessels suitable for docking.

These data indicate the range of drydocking facilities existing in the Naval Shore Establishment for planning of drydocking operations. Appendix A tabulates facilities that are currently leased or on inactive status. In most instances, these may be reactivated upon short notice.

1-4 FACILITIES LOCATIONS AND GENERAL DATA

1-4.1 **Figure Data**. Figures 1 through 30 present graving drydock specific locations in the Naval Shore Establishment. Each facility is defined by a location plan, longitudinal section, and typical cross-section with limited design, construction and foundation information, and key dimensions. General data are given for each drydocking facility.

1-4.1.1 **Graving Drydocks**. Data includes the date of construction, type of entrance closure, dewatering and flooding system, power capstans, portal cranes, and ship and industrial services furnished at the dock.

1-4.1.2 **Marine Railways**. Data includes the date of construction, rated capacity, groundways and cradle description, hauling mechanism, portal cranes, and ship and industrial services furnished at the railway.

1-4.1.3 **Marine Lifts**. Data includes the date of construction, rated capacity, lift type, capacity of hoists, description of cradle, lift platform and transfer systems, and the ship, industrial and crane services available at the lift.

1-4.2 **Data Limitations**. Ship and industrial services described are built-in permanent types. Portable components are often available to supplement quantities to suit peak demands or special requirements. For detailed information on structures, outfitting equipment,

and service systems, refer to Naval Facilities Engineering Command (NAVFACENGCOM), Engineering Innovation and Criteria Office (EICO).

Table 1 Drydocks Characteristics Summary Graving Drydocks

		Size and Water Depth					
Name / Location	Dock No.	Width (at top of coping)	Length (from head end coping to caisson face)	Depth (over sill at MHW)	Superflood (above MHW)	Mean Tide Range	Suitable for Docking
Trident Refit Facility, Bangor, WA	-	80’ 0”	715’ 6”	53’ 0”	4’ 0”	10.0’	SSBN
Norfolk Naval Shipyard, Portsmouth, VA	1	88’ 3.5”	325’ 4”	25’ 8”	-	2.8’	Service Craft
	2	106’ 10”	498’ 6”	37’ 4 3/4”	6’ 4”	2.8’	DD, SSBN
	3	128’ 0”	728’ 0”	34’ 7”	6’ 4”	2.8’	CGN, SSBN
	4	144’ 0”	1010’ 6 1/2”	44’ 2”	-	2.8’	CV
	6	76’ 8”	459’ 0”	20’ 5”	-	2.8’	Service Craft
	7	76’ 8”	459’ 0”	20’ 5”	-	2.8’	Service Craft
	8	150’ 0”	1092’ 5”	47’ 11”	-	2.8’	CVN
Pearl Harbor Naval Shipyard, Oahu, Hawaii	1	138’ 0”	1002’ 5”	35’ 0”	5’ 0”	1.5’	CVA
	2	147’ 0”	1000’ 5 7/8”`	48’ 6”	-	1.5’	CVA
	3	104’ 0”	497’ 6”	22’ 8”	8’ 0”	1.5’	DD, SSBN
	4	155’ 0”	1088’ 8”	48’ 8”	-	1.5’	CVN
Portsmouth Naval Shipyard, Portsmouth, NH	1	104’ 0”	435’ 3”	25’ 0”	-	8.0’	SSN
	2	129’ 0”	686’ 5”	30’ 4”	2’ 6”	8.0’	SSBN
	3	71’ 0”	486’ 0”	37’ 0”	3’ 8”	8.0’	SSBN
Puget Sound Naval Shipyard, Bremerton, WA	1	108’ 0”	638’ 11”	30’ 2”	5’ 4”	8.0’	SSN, SSBN
	2	145’ 0”	867’ 0”	38’ 2”	-	8.0’	CVA, CVS, SSBN
	3	130’ 0”	926’ 8”	23’ 8”	-	8.0’	DD, SS
	4	147’ 0”	997’ 10”	45’ 2”	-	8.0’	CV
	5	147’ 0”	1030’ 8”	45’ 2”	-	8.0’	CGN, SSBN
	6	180’ 0”	1151’ 11 5/8”	53’ 2”	-	8.0’	CVN, CV
San Diego Naval Station, San Diego, CA	1	104’ 0”	593’ 6”	36’ 8”	-	4.9’	CG

Figure 1 Location of Drydock, Trident Refit Facility, Bangor, Washington

Drydock Portal Cranes	
Crane No.	Capacity (lg tons)
1	50, 7.5
2	50, 7.5

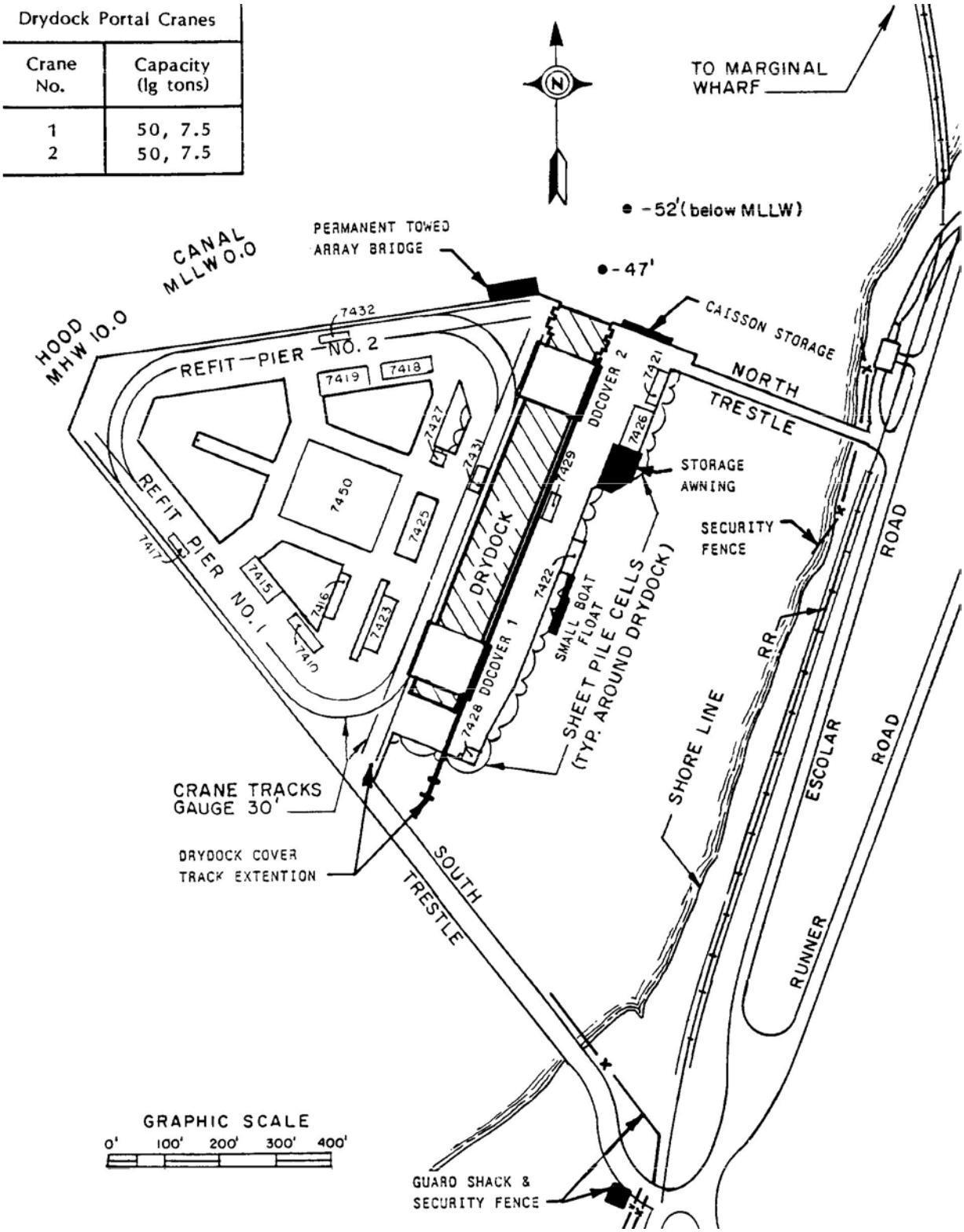


Figure 2 Trident Refit Facility, Bangor Drydock

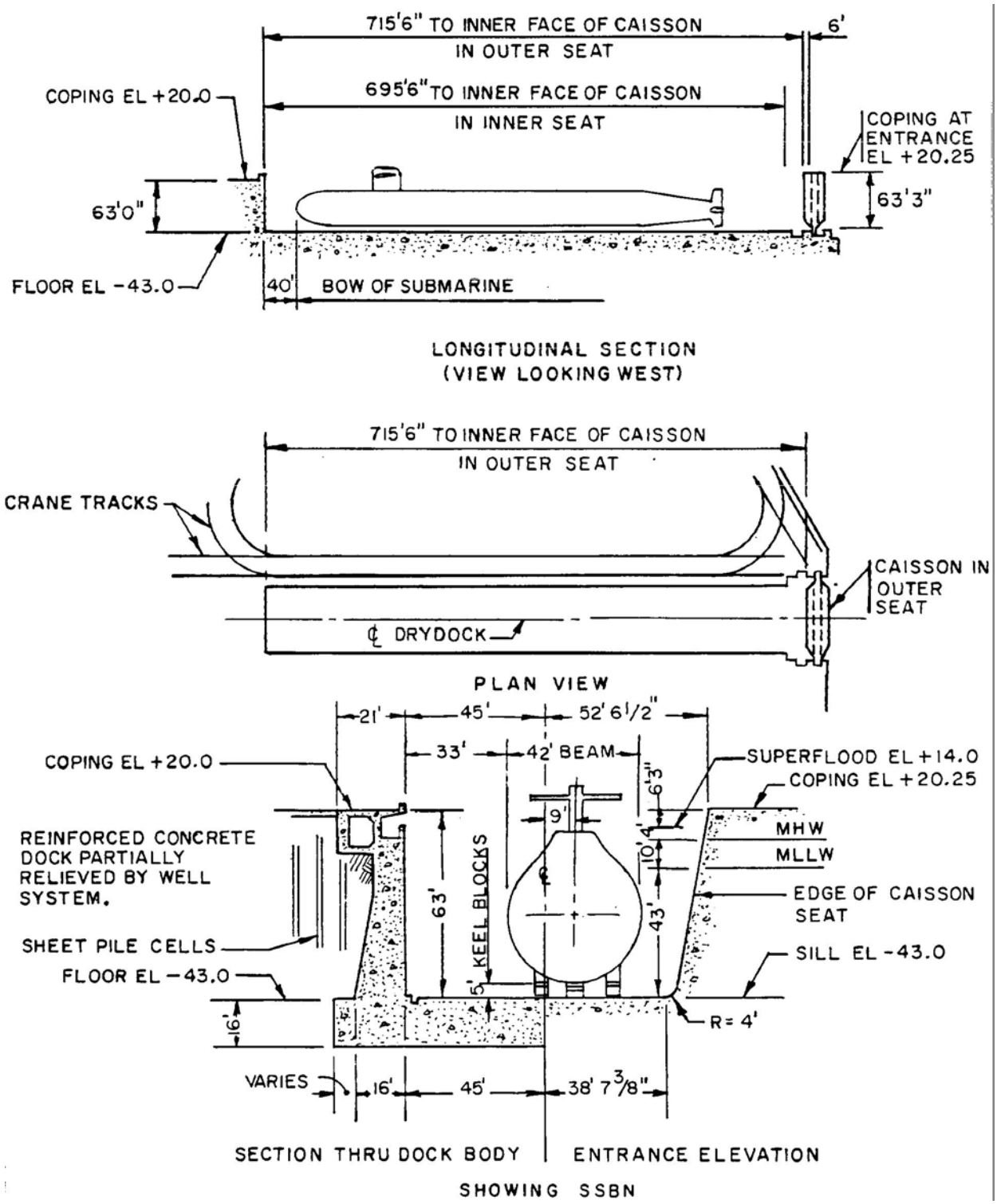


Table 2 Trident Refit Facility, Bangor Drydock

Date Completed	Suitable for Docking	Foundation	Construction Material
1981	SSBN	Earth	Concrete
Closure	Caisson, steel (rectangular box type)		
Dewatering Pumps	Three 42”, 700 hp, 162,000 gpm. One dewatering pump used for superflooding. Time to dewater: 165 minutes		
Drainage Pumps	Two 12”, 200 hp, 5000 gpm		
Flooding	Through culverts. Time to flood: 60 minutes		
Captstans	9 total: 1 at head, 1 each side of entrance, 3 ea side, 30 fpm at 30K		
Portal Crane Maximum Capacities and Heights			
Cranes 015 & 016 Hook	Capacity, lbs	Max radius at full capacity	Max height above coping with hook at dock centerline
Main Auxiliary Whip	A 170,000 B 112,000 50,000 15,000	70’ 100’ 160’ 165’	92’ 92’ 192’ 192’
Cranes 03 & 04 Main Whip	 50,000 17,000	 115’ 140’	 128’ 164’
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz Ac, 3 Ph, 60 Hz Ac, 3 Ph, 60 Hz	460 450 120/208	2,000 3,200 1,000	1 east side and 5 west side at 400 amps; 2 east side and 14 west side at 200 amps; 4 east side at 100 amps. 8 each side at 400 amps 4 west side at 100 amps; 8 west side and 2 east side at 60 amps
Fresh water_____12" mains, 610 gpm at 50 psi, six 1-1/2" outlets each side. Fire/flushing_____12" mains, 3,000 gpm at 125 psi, five 2-1/2" and one water 2" outlets each side. Aux sea water _____8" supply and return mains, 1,650 gpm at 80 psi, ten 2-1/2" cooling supply and ten 2-1/2" return connections west side Chilled water_____ 6" supply and return mains, 600 gpm at 65 psi, one 6" supply and one 6" return connections west side. Low pressure air ____8" mains, 3,000 cfm at 100 psi, forty 1-1/4" each side. High quality/ _____3" main, 800 cfm at 145 psi, eleven 1-1/4" and ten breathing air 3/4" outlets west side Sanitary sewer_____4" force mains, 100 gpm at 50 psi, two 2-1/2" inlets each side Ship Ovbd Drain_ __4" force main, 4,600 gpd at 150 psi, two 2-1/2" inlets each side			

Figure 3 Location of Drydock, Trident Refit Facility, Kings Bay, Georgia

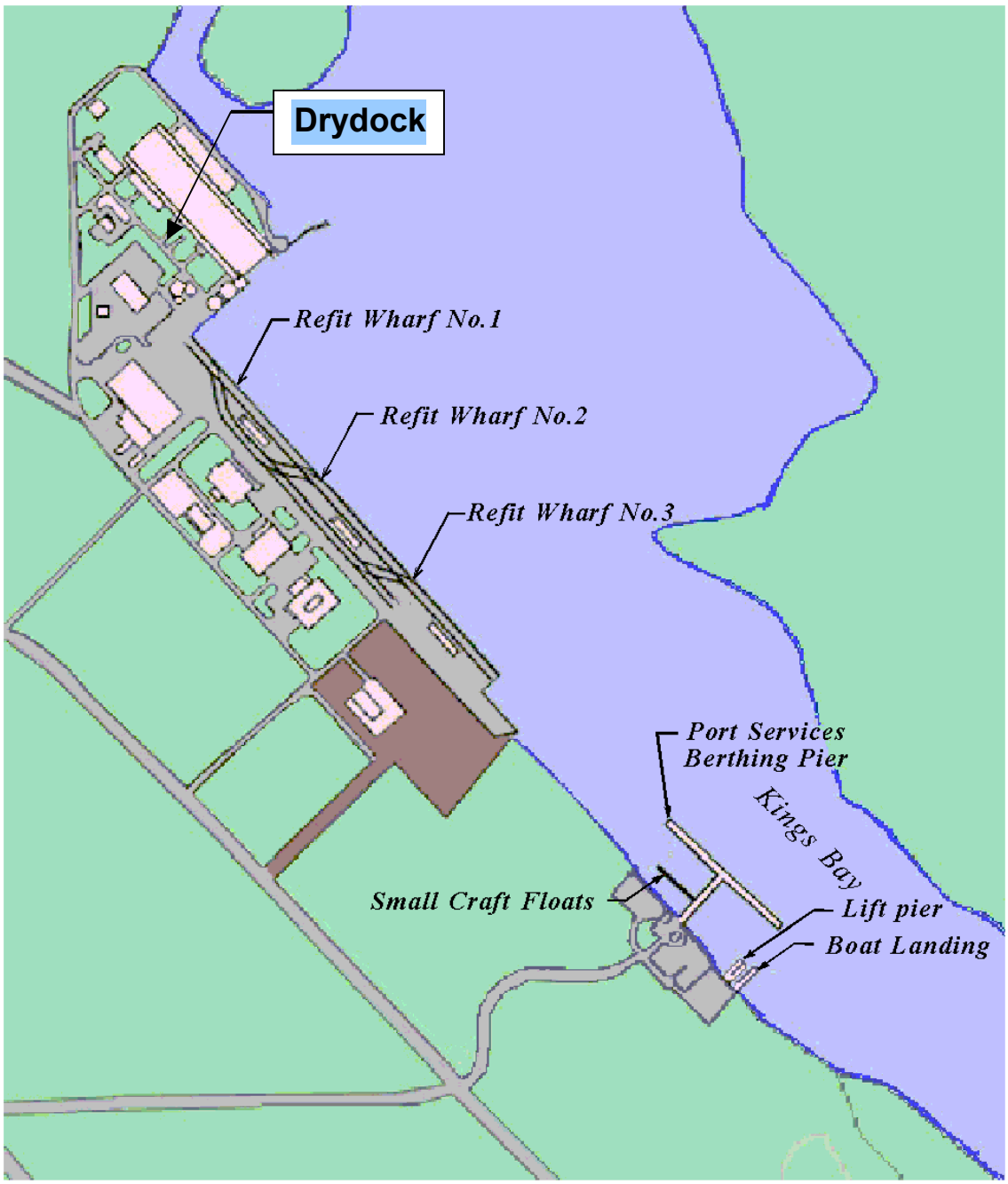


Figure 4 Trident Refit Facility, Kings Bay Drydock

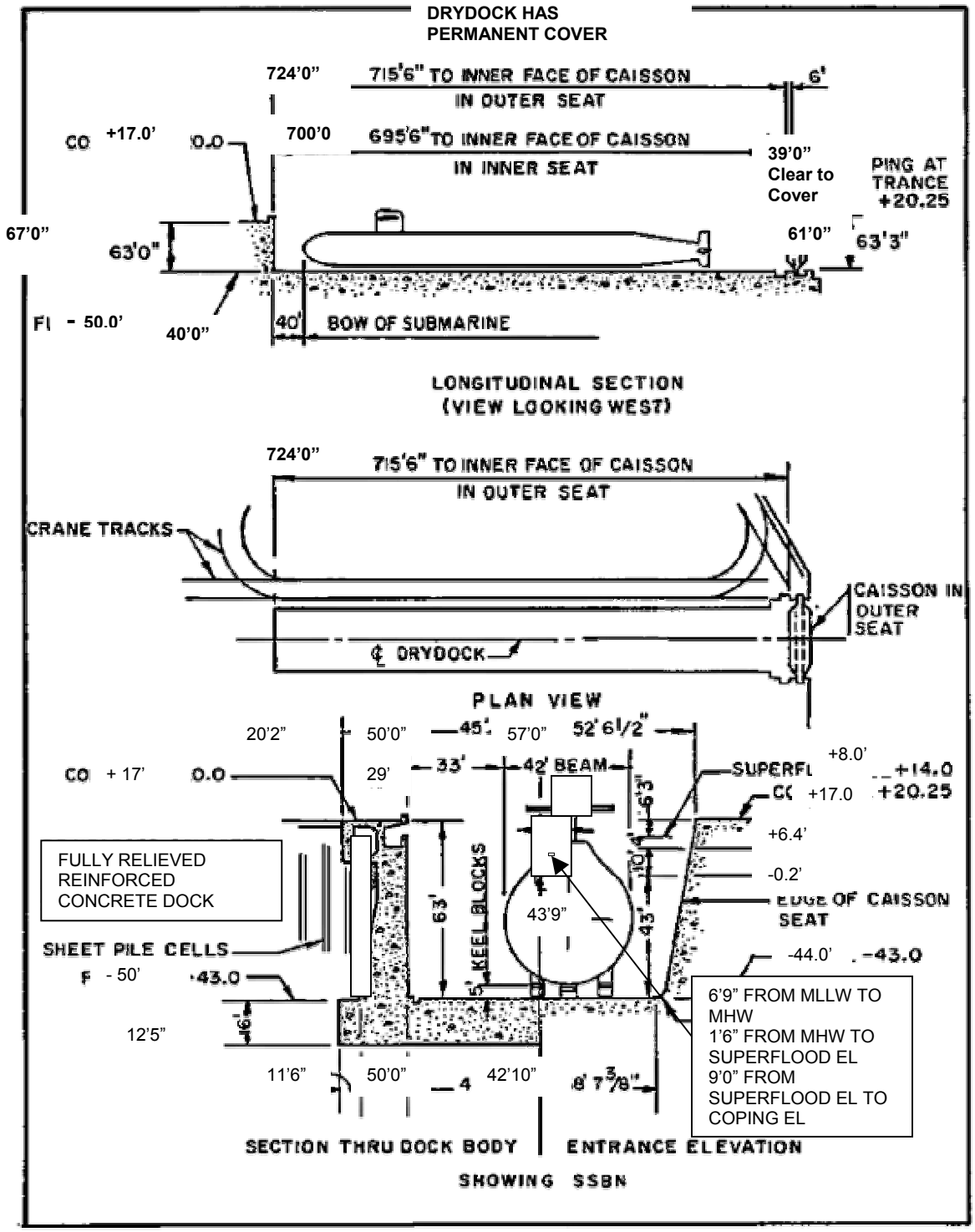
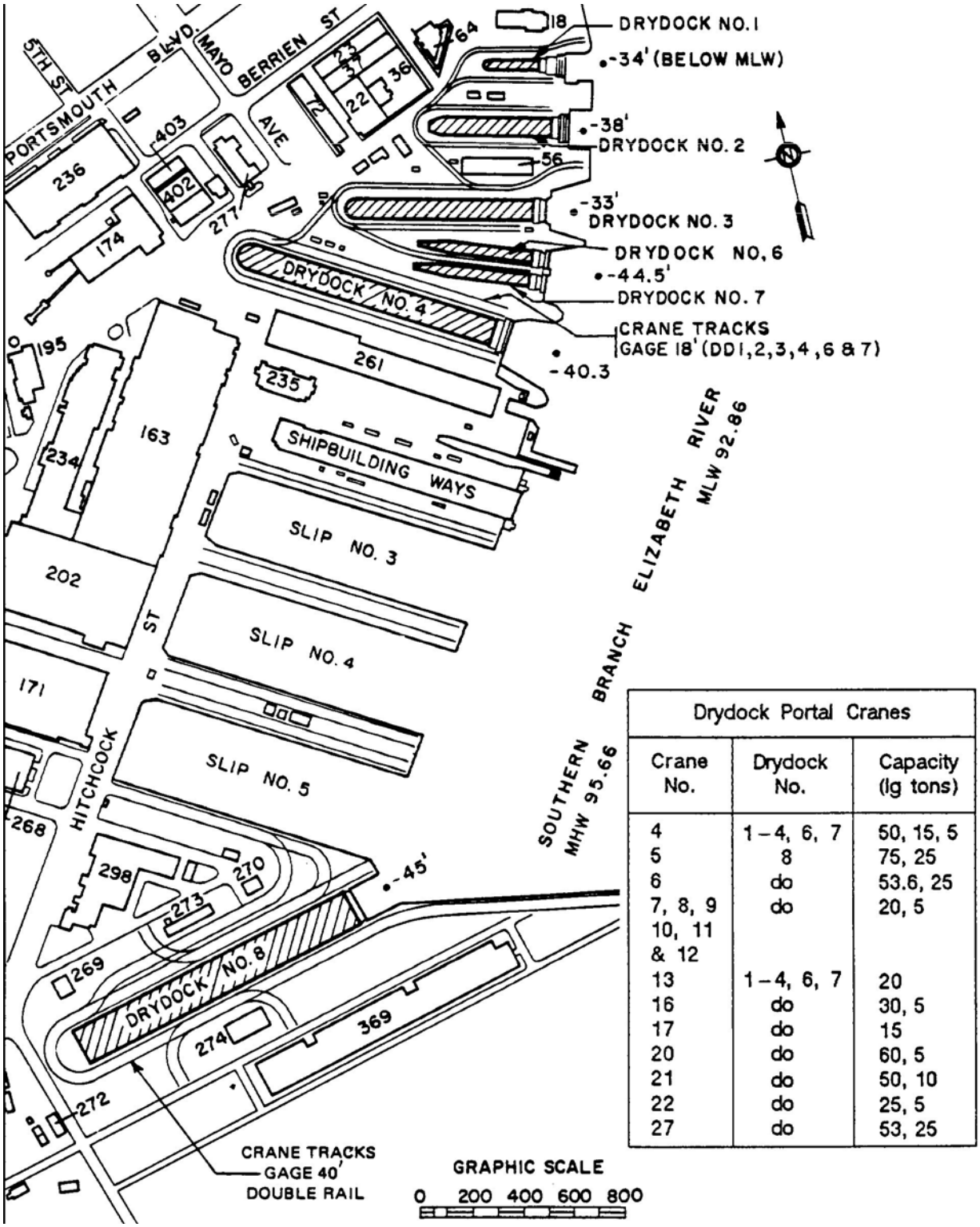


Table 3 Trident Refit Facility, Kings Bay Drydock

Date Completed	Suitable for Docking	Foundation	Construction Material
1989	SSBN/SSN/SC	Earth	Concrete
Closure	Caisson, steel or concrete (rectangular box type)		
Dewatering Pumps	Three 42”, 1250 hp, 72,100 gpm. One dewatering pump used for superflooding the dock Design time to dewater: 150 min (no unit in dock)		
Drainage Pumps	Two 6”, hp, 500 gpm secondary pumps Two 24”, hp, 5000 gpm primary pumps		
Flooding	Two 8’x8’ conduits; design time to flood 45 min (no unit in dock)		
Captstans	9 total: 1 at head, 1 each side of entrance, 3 each Side of dock. 100,000 lbs at 0 to 30 degrees		
Bridge Crane Maximum Capacities and Heights			
CRANE	CAPACITY: MAIN/AUX	MAX HEIGHT	
“G” “H” “I”	85/15 TON 85/15 TON 15/5 TON	61 FT 61 FT 85 FT	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	460	8,800	4 west and east side at 400 amps; 14 west and 11 east side at 200 amps ea; 6 east side at 400 amps
Ac, 3 Ph, 60 Hz	450	6,400	8 each side at 400 amps
Ac, 3 Ph, 60 Hz	120/208	1,760	4 each side at 100 amps; 8 each side at 60 amps
Ac, 3 Ph, 400 Hz	460	400	1 each side at 200 amps
Potable water___16" mains, 55 gpm at 45-65 psi, six 1-1/2" outlets each side. Fire/Flushing____12" mains, 2000 gpm at 70 psi, (5) 2-1/2" outlets each side And one 2” outlet each side ASW_____ ___10" supply and return mains, 900 gpm at 80 psi (per pump) 3 pumps, ten 2-1/2” supply and return connections each side CW_____8” supply and 10” return mains, 600 gpm at 134 psi, two 6” Supply and return connections on west side only LP Air _____6" mains at 4000 cfm at 100 psi, 40 (1 ¼”) each side HP Air_____3/4” main, 118 cfm at 4200 psi, 2 (1/2”) outlets each side Breathing Air___4” main, 400 cfm at 100-125 psi, 10 (1 ¼”) & 10 (1/2”) outlets ea side CHT_____4" force mains to wet well, 236 gpm at 50 psi, 2 (2 ½”) inlets ea side SOD_____4" force mains to oily waste wet well, 150 gpm at 50 psi, 2 (2 ½”) inlets each side DSW_____Supplied from ASW system east side only, 2 (1 ½”) hoses run To ship connections, return to basin floor drainage Phone_____ 8 stations, 5 on west side, 3 on east side			

Figure 5 Location of Drydocks, Norfolk Naval Shipyard, Portsmouth, Virginia



Drydock Portal Cranes		
Crane No.	Drydock No.	Capacity (lg tons)
4	1–4, 6, 7	50, 15, 5
5	8	75, 25
6	do	53.6, 25
7, 8, 9	do	20, 5
10, 11 & 12		
13	1–4, 6, 7	20
16	do	30, 5
17	do	15
20	do	60, 5
21	do	50, 10
22	do	25, 5
27	do	53, 25

Figure 6 Norfolk Naval Shipyard, Drydock No. 1

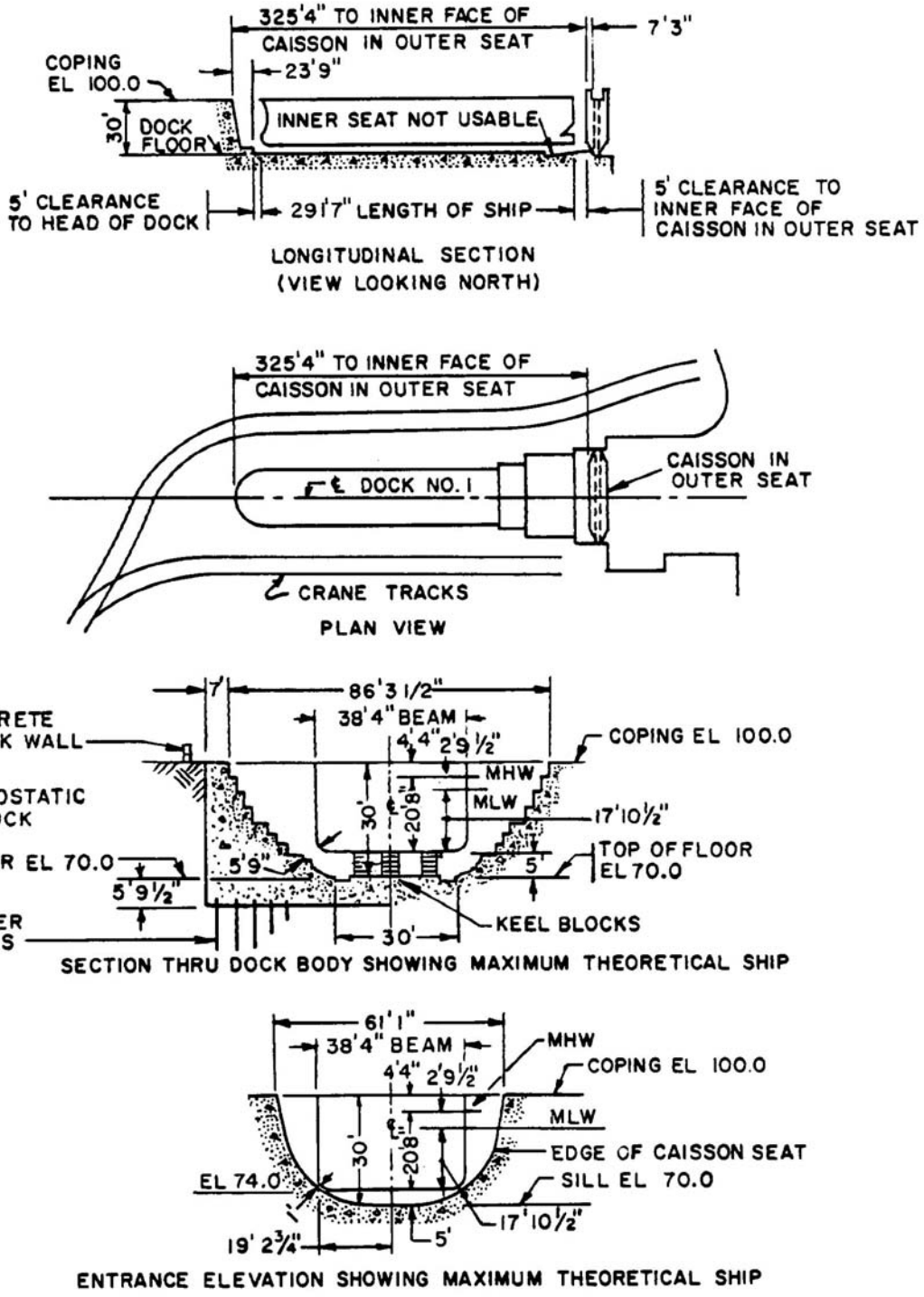


Table 4 Norfolk Naval Shipyard Drydock No. 1

Date Completed	Suitable for Docking	Foundation	Construction Material
1833	Service Craft	Piles	Granite

Closure	Caisson, steel (rectangular box type).
Dewatering Pumps	One 42", 600 hp, 45,000 gpm; one 42", 600 hp, 50,000 gpm; one 42", 800 hp, 96,000 gpm (Drydock No. 2 pumphouse) Time to dewater: 40 min.
Drainage Pumps	Two 12", 125 hp, 9,000 gpm (Drydock No. 2 pumphouse); One 6", 60 hp 1000 gpm.
Flooding	Through caisson. Time to flood: 90 min
Captstans	4 total: 1 at head, 30 fpm at 30k; 1 each side of entrance, 30 fpm at 12k; 1 south side at head, 30 fpm at 30k

NNSY Dock Crane Capacities and Heights over Drydocks

Dock Cranes	Hook	Max Cap @ 5' Beyond dock center line long/short tons	Max Ht above top of rail with hook @ dock center line	Comments
29,30,31,32 33,34	Main Whip	53.6/60 13.4/15	149' 165'	Centerline of crane rails to centerline of Drydock 1 = 66'8 ½"

Ship and Industrial Services Furnished at Dock

Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	460	1,200	3 south side at 400 amps

Fresh water	6" mains, 300 gpm at 50 psi, one 2-1/2" outlet each side
Saltwater	6" north side main, 850 gpm at 150 psi, three 2-1/2" outlets and one 4" outlet north
Fire Protection	Same as saltwater
Compressed Air	4" main, 1,600 cfm at 100 psi, sixteen 2" outlets south side
Steam	None
Sanitary sewer	None

Figure 7: Norfolk Naval Shipyard, Drydock No. 2

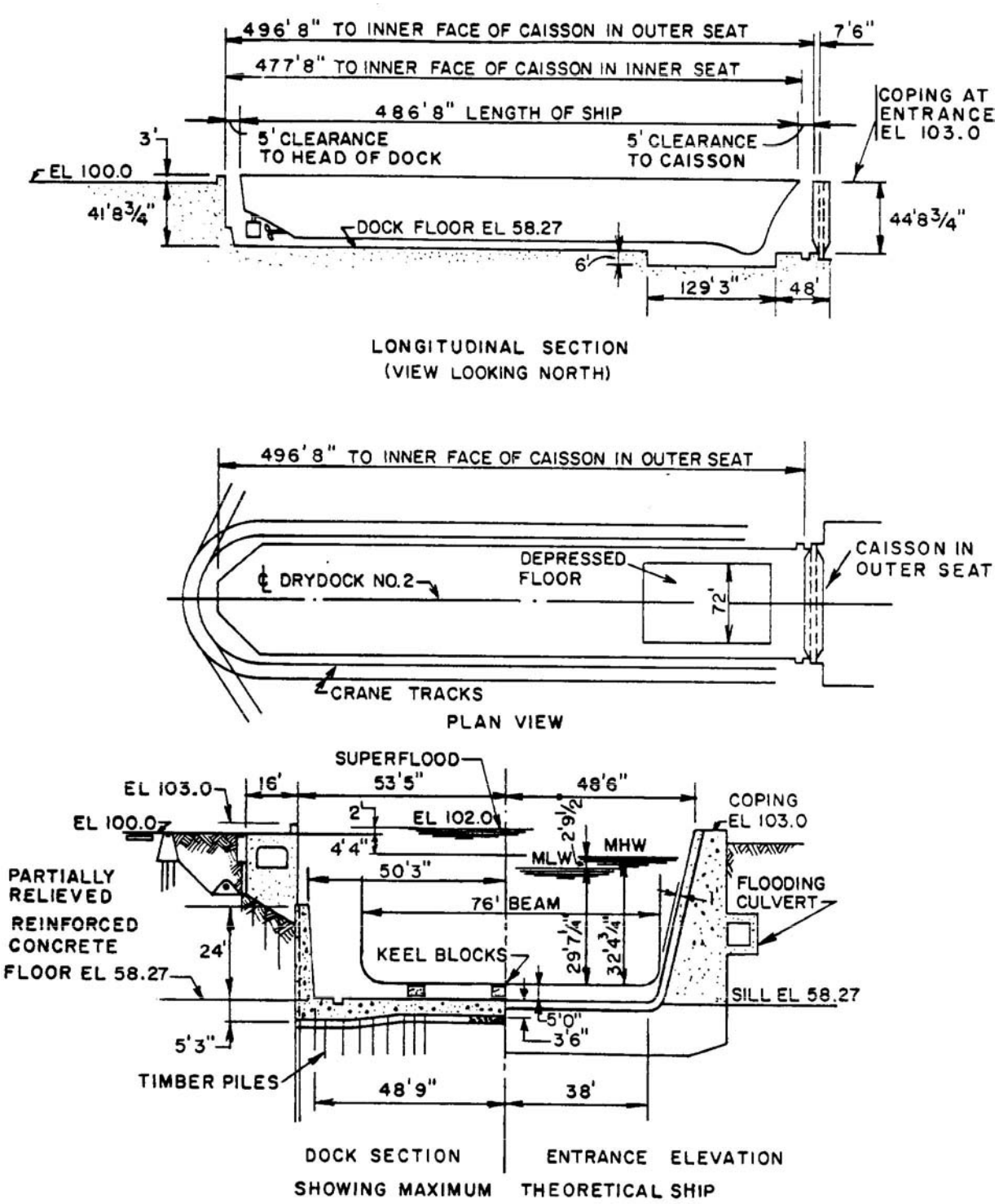


Table 5 Norfolk Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1966	DD, SSBN	Piles	Concrete

Closure	Caisson, steel (rectangular box type).
Dewatering Pumps	One 42", 600 hp, 45,000 gpm; one 42", 600 hp, 50,000 gpm; one 42", 800 hp, 96,000 gpm. Pumps also used for Drydocks No. 1 and 3. Time to dewater: 100 min.
Drainage Pumps	Two 12", 125 hp, 9,000 gpm (also used for Drydocks No. 1 and 3); two 5", 40 hp, 2000 gpm
Flooding	Through culvert. Time to flood: 120 min. Dewatering Pump No. 2 used to superflood.
Captstans	Total 7: 1 each side of entrance, north side entrance 30 fpm at 12k, south side entrance 30 fpm at 30k; two south side 30 fpm at 30k; two north side (Drydock #1 capstan), 30 fpm at 30k; and one north side head of drydock 30 fpm at 30k

NNSY Dock Crane Capacities and Heights over Drydocks

Dock Cranes	Hook	Max Cap @ 5' Beyond dock center line long/short tons	Max Ht above top of rail with hook @ dock center line	Comments
29,30,31,32 33,34	Main Whip	53.6/60 13.4/15	142' 160'	Centerline of crane rails to centerline of Drydock 2 = 77' 8 ¼"

Ship and Industrial Services Furnished at Dock

Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	11,500	900	North side 1 receptacle, south side 2 receptacles at the pad for 11.5kv/460V portable substations, one with connection for a 12 circuit turtleback dockside and one with connections for an 11 circuit turtleback dockside
Ac, 3 Ph, 60 Hz	460	5,600	15 north side and 26 south side at 400 amps

Fresh water_____	6" mains, 1,650 gpm at 50 psi, five 2-1/2" outlets and 1 4" outlet each side
Saltwater _____	12" mains, 3,650 gpm at 150 psi, six 2-1/2" outlets and two 4" Outlets north side, nine 2-1/2" outlets and six 4" outlets south side
Fire Protection ___	Same as saltwater
Compressed Air__	6" mains, 12,200 cfm at 100 psi, fifteen 2" outlets north side, twenty 2" outlets south side. Three 4" and seven 2" outlets in bottom dock each side
Steam_____	6" mains, 12,000 phr at 100 psi, ten 2" outlets north side, 6 2" outlets south side
Sanitary sewer___	8" mains, eight 4" Inlets north side, four 4" Inlets south side

Figure 8 Norfolk Naval Shipyard, Drydock No. 3

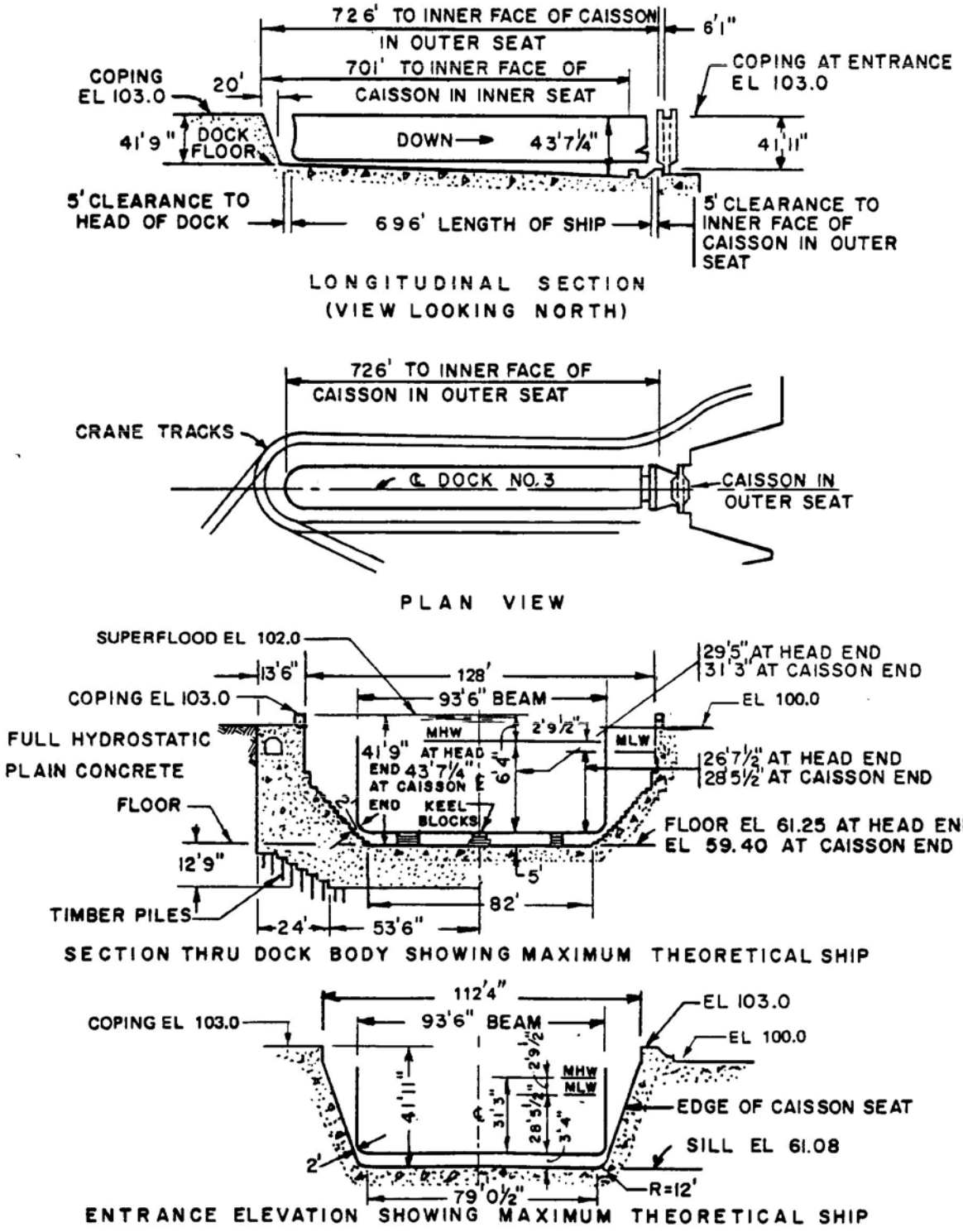


Table 6 Norfolk Naval Shipyard Drydock No. 3

Date Completed	Suitable for Docking	Foundation	Construction Material
1911	CGN, SSBN	Piles	Concrete and Granite

Closure	Caisson, steel (rectangular box type).
Dewatering Pumps	Pumphouse #2 - One 42", 600 hp, 45,000 gpm; one 42", 600 hp, 50,000 gpm; one 42", 800 hp, 96,000 gpm. Pumps also used for Drydock No. 2 pumphouse). Pumphouse #3 – 16”, 125 hp, 8500 gpm; 12”, 125 hp, 7000gpm Time to dewater: 209 min
Drainage Pumps	Two 12", 125 hp, 9,000 gpm (Drydock No. 2 pumphouse). Two 6”, 40 hp, 1800 gpm (Drydock No. 3 pumphouse)
Flooding	Through caisson. Time to flood: 135 min. Dewatering Pump No. 2 (Drydock No. 2 pumphouse) used to superflood
Captstans	11 total: 1 at head, 30 fpm at 30k; 2 each side of entrance (Total 4) 30 fpm at 30K; 3 north side at 30 fpm at 30k; 1 north side 30 fpm at 12k; 2 south side 30 fpm at 30k

NNSY Dock Crane Capacities and Heights over Dyrdocks

Dock Cranes	Hook	Max Cap @ 5’ Beyond dock center line long/short tons	Max Ht above top of rail with hook @ dock center line	Comments
29,30,31,32 33,34	Main Whip	53.6/60 13.4/15	140’ 158’	Centerline of crane rails to centerline of Drydock 3 = 80’ 8 ½”

Ship and Industrial Services Furnished at Dock

Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	11,500	600	North side, 2 receptacles at the pad for 11.5kV/460V portable substations, with connections for a 1-12 circuit turtleback dockside and with connections for a 1-11 circuit turtleback dockside.
Ac, 3 Ph, 60 Hz	460	8,800	14 North side; 26 south side at 400 ampls

Fresh water	6" mains, 1,800 gpm at 50 psi, twelve 2-1/2" outlets and one 4" outlet each side
Saltwater	12" mains, 6,400 gpm at 150 psi, eight 4" outlets each side
Fire Protection	Same as saltwater
Compressed Air	5", 6", an 8" mains, 15,000 cfm at 100 psi, twenty eight 2" outlets each side. 4" headers at dock floor with seventeen 2" outlets each side
Steam	6" mains, 30,000 pph at 100 psi, eight 2-1/2" north side; sixteen 2 ½” south side
CHT sewer	8" mains, ten 4" inlets north side and sixteen 4” inlets south side.

Figure 9 Norfolk Naval Shipyard, Drydock No. 4

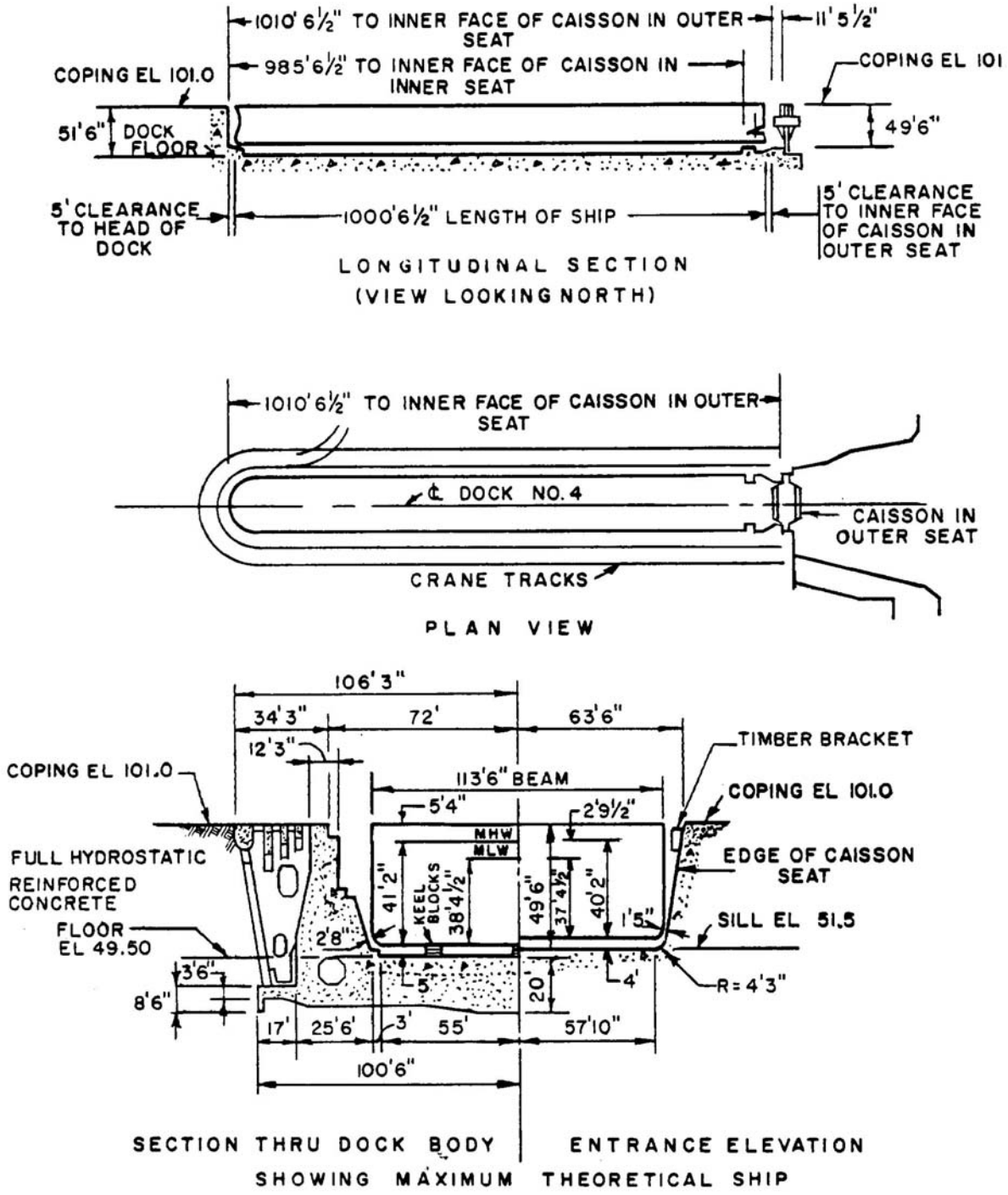


Table 7 Norfolk Naval Shipyard Drydock No. 4

Date Completed	Suitable for Docking	Foundation	Construction Material
1919	CV, SSN	Earth	Concrete

Closure	Caisson, steel (hydrometer type).
Dewatering Pumps	One 54", 1,250 hp, 330,000 gpm; Pumps one also used for Drydock No. 6 and 7. Time to dewater: 180 min
Drainage Pumps	Two 12", 200 hp, 10,000 gpm. Pumps also used for Drydock No. 6 and 7
Flooding	Through culverts. Time to flood: 135 min
Captstans	13 total: 1 at head, 1 each side of entrance, 1 at Berths 19 and 20, 5 north side, 4 south side, 30 fpm at 30k; and 1 south side, 30 fpm at 12K

NNSY Dock Crane Capacities and Heights over Dyrdocks

Dock Cranes	Hook	Max Cap @ 5' Beyond dock center line long/short tons	Max Ht above top of rail with hook @ dock center line	Comments
29,30,31,32	Main	53.6/60	140'	Centerline of crane rails to centerline of Drydock 3 = 80' 8 ½"
33,34	Whip	13.4/15	158'	
Stiffleg Derrick (Fixed Location)	Main	147.3/165	182'	Distance from the Center of Rotation of Stiffleg Derrick to Centerline of Drydock 4 = 133' 9 ½"
	Auxiliary	13.4/15	214'	

Ship and Industrial Services Furnished at Dock

Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	460	8,000	Thirty seven north side and nineteen south side at 400 amps

Fresh water	6" mains, 2,100 gpm at 50 psi, fourteen 2-1/2" outlets each side
Saltwater	12" mains, 7,000 gpm at 150 psi, south side fourteen 4" and Six 2 ½"; north side twelve 4" and four 2 ½"
Fire Protection	Same as saltwater
Compressed Air	6" mains, 10,000 cfm at 100 psi, sixteen two 2" outlets each side
Steam	6" mains, 30,000 phr at 100 psi, north side twenty two 2" And south side sixteen 2"
CHT sewer	8" and 10" mains, north side twenty 4" and south side Sixteen 4"

Figure 10 Norfolk Naval Shipyard, Drydock No. 6

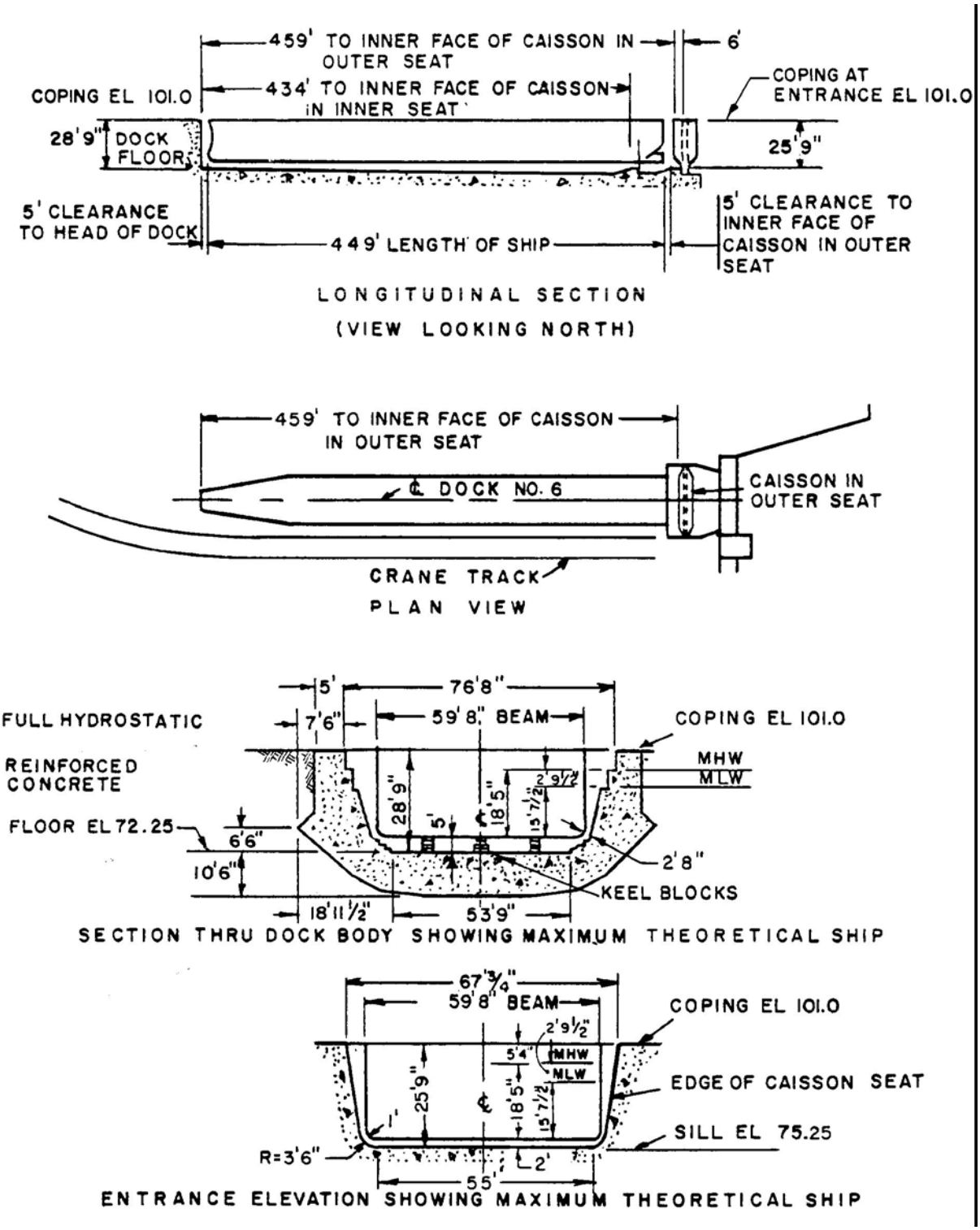


Table 8 Norfolk Naval Shipyard Drydock No. 6

Date Completed	Suitable for Docking	Foundation	Construction Material
1919	N/A	Earth	Concrete
Closure	Caisson, steel (rectangular box type).		
Dewatering Pumps	Three 54", 1,250 hp, 330,000 gpm. (Drydock No. 4 pumphouse). Time to dewater: 30 min		
Drainage Pumps	Two 12", 200 hp, 10,000 gpm. (Drydock No. 4 pumphouse).		
Flooding	Through caisson. Time to flood: 30 min.		
Captstans	Total 6 – 3 on North side at 30 fpm at 30K (used by Drydock #3); and 2 South side 30 fpm at 30K (used by Drydock #7)		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main Auxiliary	60 lg tons 5 lg tons	109' 10" 152' 0", 64' 0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
None			
Fresh water_____None Saltwater _____ 12" mains, 3,200 gpm at 150 psi, four 4" outlets each side Fire Protection _____Same as saltwater Compressed Air_____ None Steam_____ _____ None Sanitary Sewer_____None			

Note: Drydocks #6 and #7 are presently not certified. Drydock #6 and #7 will be filled in by 2004

Figure 11 Norfolk Naval Shipyard, Drydock No. 7

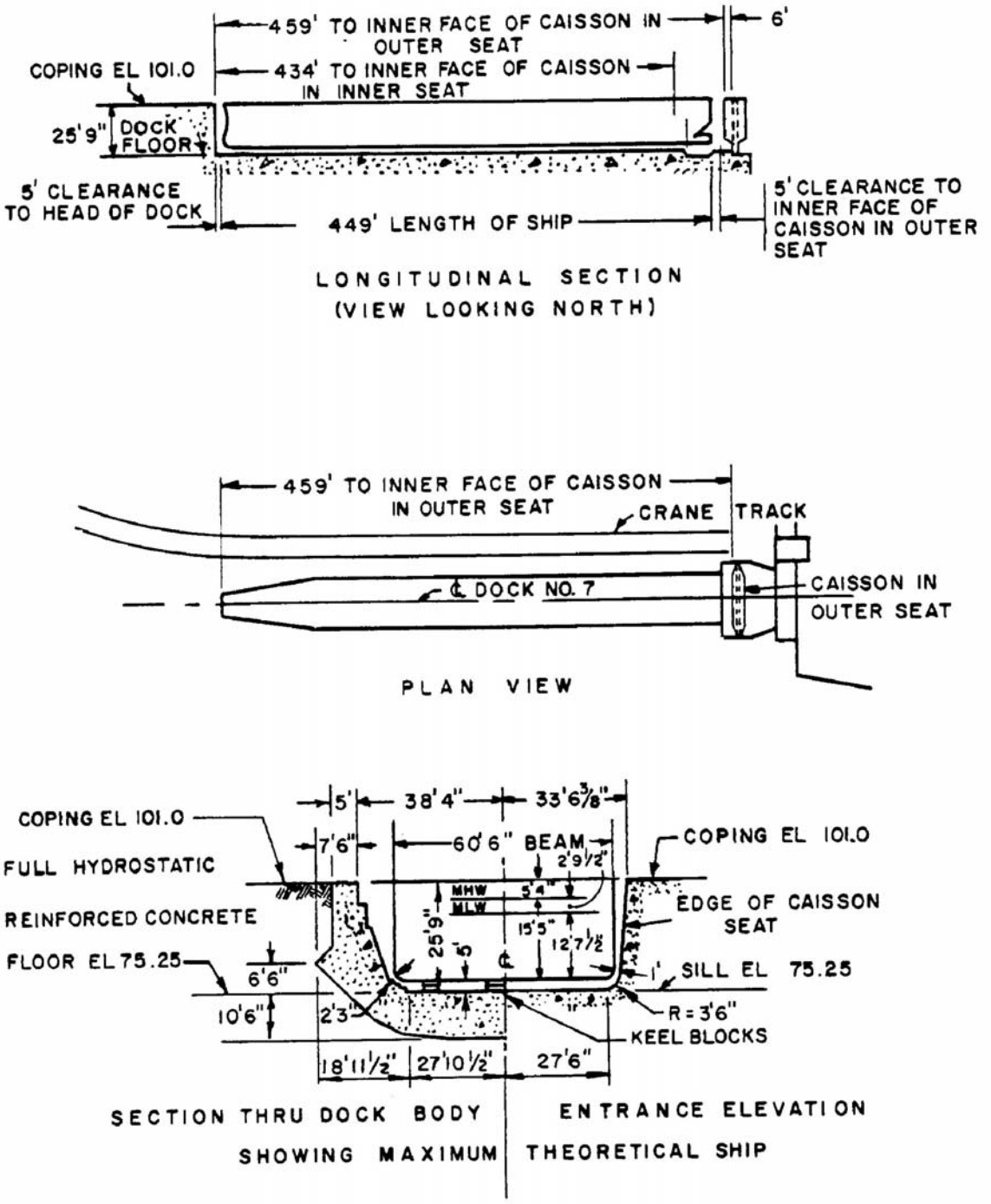


Table 9 Norfolk Naval Shipyard Drydock No. 7

Date Completed	Suitable for Docking	Foundation	Construction Material
1919	N/A	Earth	Concrete
Closure	Caisson, steel (rectangular box type).		
Dewatering Pumps	Three 54", 1,250 hp, 330,000 gpm. (Drydock No. 4 pumphouse). Time to dewater: 15 min		
Drainage Pumps	Two 12", 200 hp, 10,000 gpm. (Drydock No. 4 pumphouse).		
Flooding	Through caisson. Time to flood: 30 min		
Captstans	Total 4: 2 at head of drydock (one used by Drydock #6 and One used by Drydock #4), 30 fpm at 30K; 1 each side of Entrance (one used by Drydock #6 and one used by Drydock #4), 2 south side, 30 fpm at 30K		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main Auxiliary	60 lg tons 5 lg tons	109' 10" 152' 0", 64' 0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	460	400	Turtleback 7-4 south side at 400 amps
Fresh water_____None Saltwater _____ 12" mains, 3,200 gpm at 150 psi, four 4" outlets each side Fire Protection _____Same as saltwater Compressed Air_____ None Steam_____ _____ None Sanitary Sewer_____None			

Note: Drydocks #6 and #7 are presently not certified. Drydock #6 and #7 will be filled in by 2004

Figure 12 Norfolk Naval Shipyard Drydock No. 8

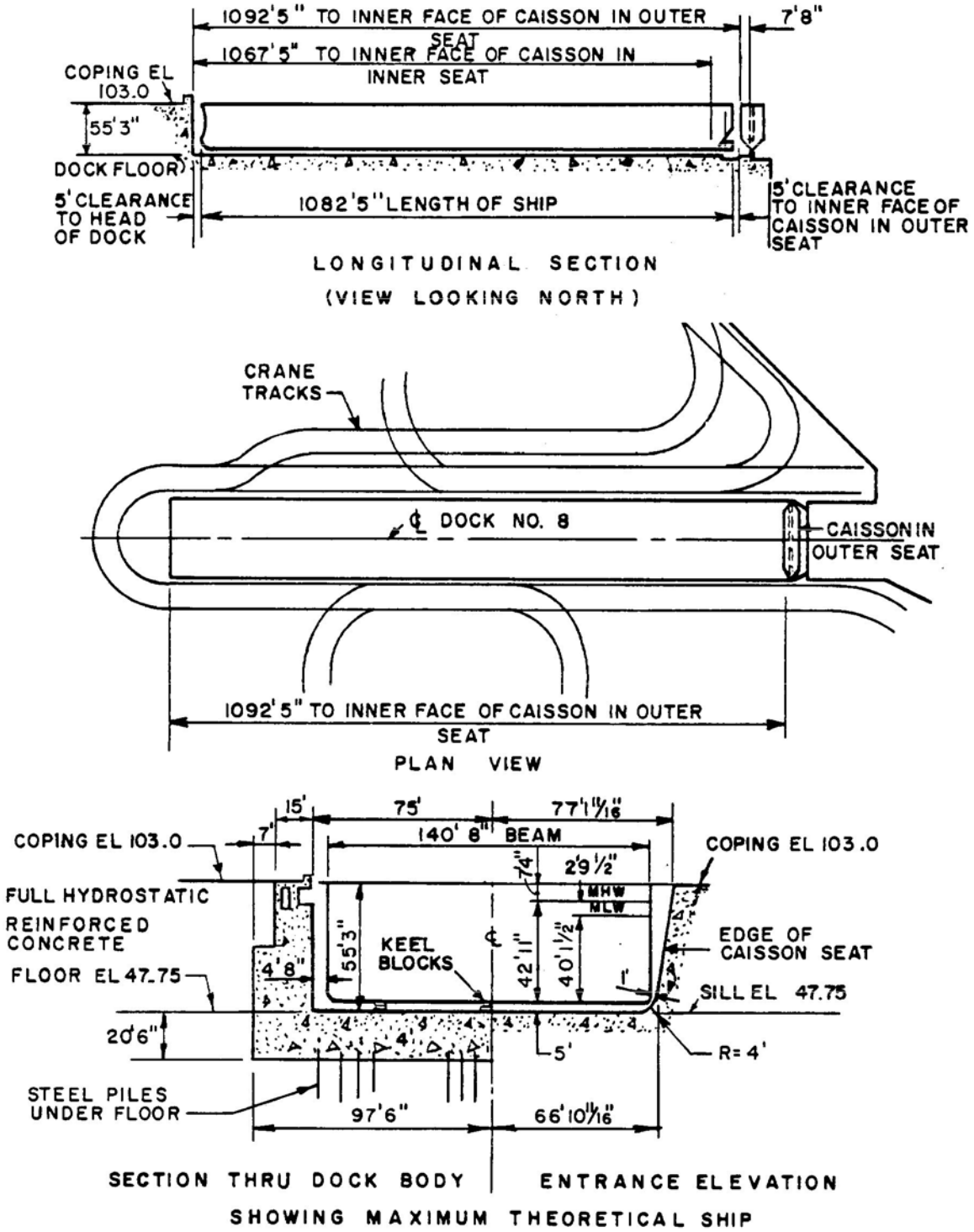


Table 10 Norfolk Naval Shipyard Drydock No. 8

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	CVN	PIles	Concrete

Closure	Caisson, steel (rectangular box type).
Dewatering Pumps	Four 54", 1,200 hp, 520,000 gpm. Time to dewater: 180 min.
Drainage Pumps	Two 16", 250 hp, 19,000 gpm
Flooding	Through culverts. Time to flood: 135 min.
Captstans	Total 14: 1 each side of entrance, 30 fpm at 30K; 1 each Side of the head of the drydock, 30 fpm at 24K; 5 north side At 30 fprm at 12K; and 5 south side at 30 fpm at 12K

NNSY Dock Crane Capacities and Heights over Dyrdocks

Dock Cranes	Hook	Max Cap @ 5' Beyond dock center line long/short tons	Max Ht above top of rail with hook @ dock center line	Comments
6, 27	Main Auxiliary	53.6/60 25.0/28	98' 208'	Dock cranes #6 and 27, 68.8 long tons
35, 41, 43	Main Whip	40.2/45 13.4/15	130' 204'	Centerline of crane rails to Centerline of Drydock 8 = 105' 7"

Ship and Industrial Services Furnished at Dock

Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	11,500	1,800	4 north side at 300 amps 2 south side at 300 amps
Ac, 3 Ph, 60 Hz	460	20,000	36 north side and 36 south side at 400 amps

Fresh water	6" and 8" mains, 3,250 gpm at 50 psi, twenty 2-1/2" outlets each side
Saltwater	16" mains, 11,500 gpm at 150 psi, twelve 4" outlets, nine 2 1/2 outlets each side
Fire Protection	Same as saltwater
Compressed Air	8" and 10" mains, 18,350 cfm at 100 psi, forty 2" outlets North side top and bottom. Forty 2" outlets south side top And twenty four 2" outlets south side bottom
Steam	6" and 10" mains, 79,000 phr at 100 psi, sixteen 2" outlets north side, twenty 2" outlets south side. Two 4" outlets south side
Oxygen	1" and 1-1/2" mains, 700 cfm at 90 psi, twenty 3/4" outlets each side
CHT sewer	6", 8" and 10" mains, twenty-six 4" inlets each side

Figure 13 Location of Drydocks, Pearl Harbor Naval Shipyard, Oahu, Hawaii

Drydock Portal Cranes		
Crane No.	Drydock No.	Capacity (lg tons)
P – 52	1, 2, 3, 4	50, 10
P – 58, 60, 61, 62, 65, & 68 – 73	do	25, 5
P – 59, 63	do	30, 5
P – 64	do	15, 5
P – 66, 67	do	50, 15, 5

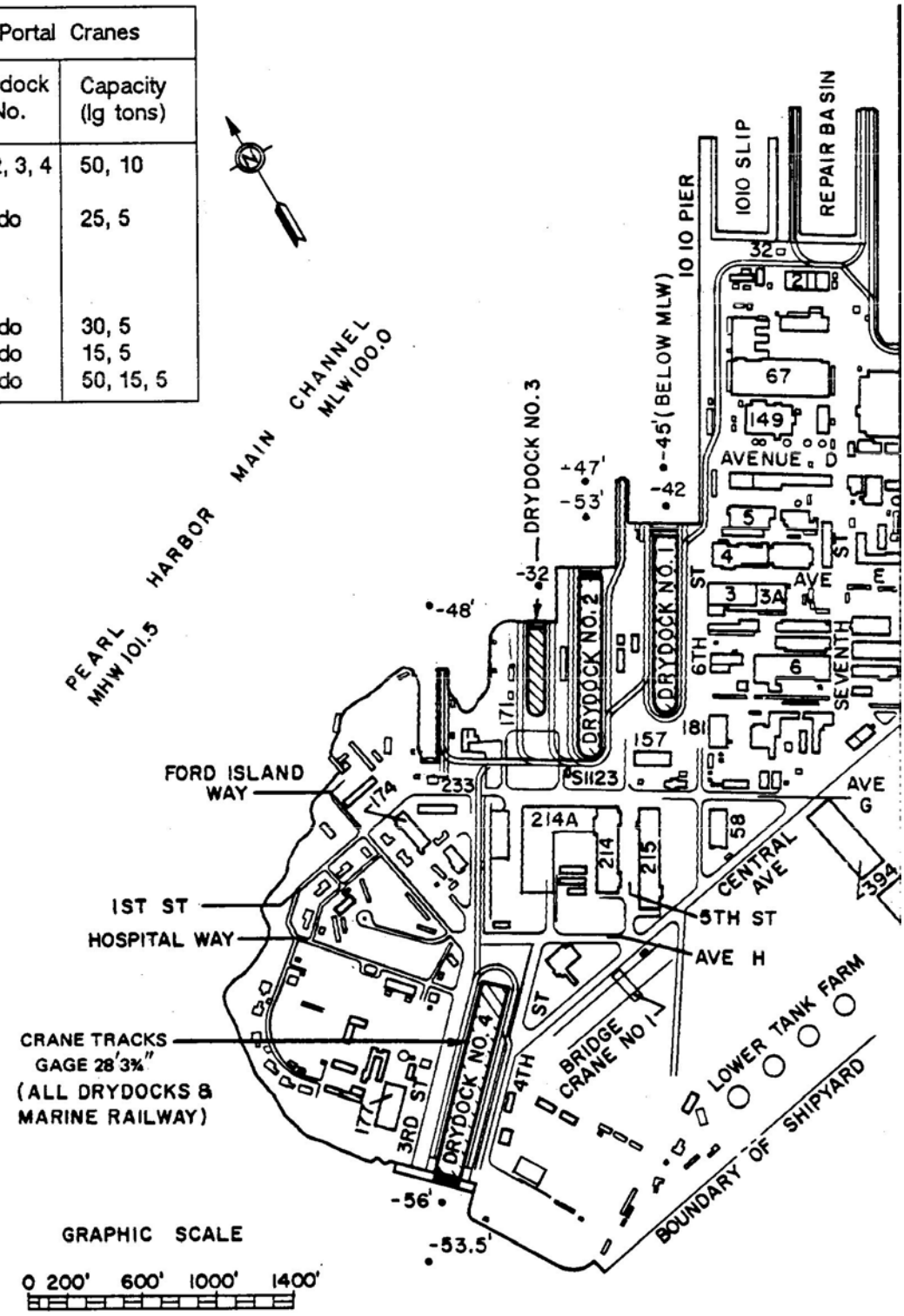


Figure 14 Pearl Harbor Naval Shipyard Drydock No. 1

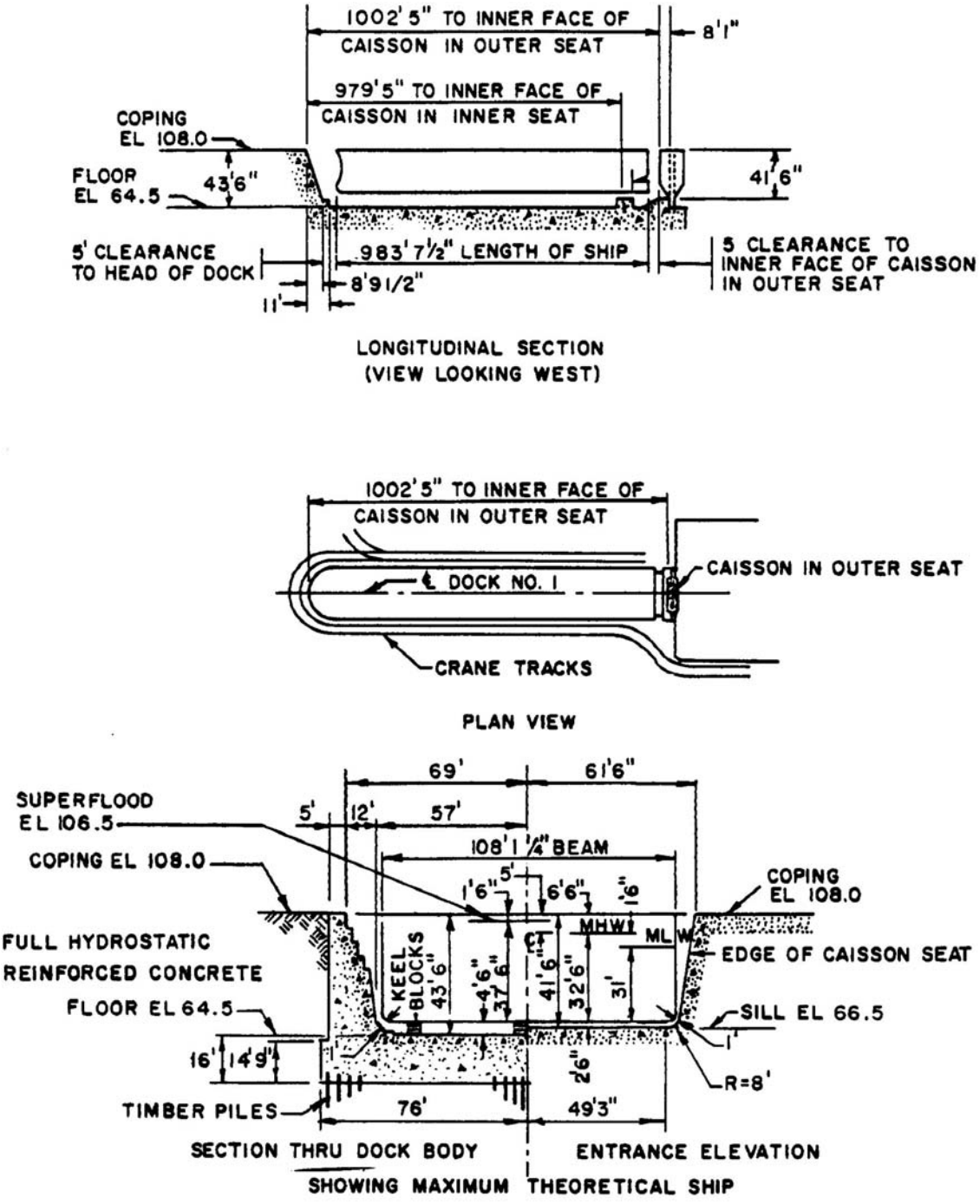


Table 11 Pearl Harbor Naval Shipyard Drydock No. 1

Date Completed	Suitable for Docking	Foundation	Construction Material
1919	CVA	PIles	Concrete
Closure	Caisson, steel (rectangular box type).		
Dewatering Pumps	Four 48", 500 hp, 264,000 gpm. Also connected to Drydock No. 2 pumphouse. Time to dewater: 140 min		
Drainage Pumps	Two 15", 85 hp, 13,750 gpm		
Flooding	Through caisson and culverts. Time to flood: 60 min. Superflooding pumps: two 30", 100 hp, 48,000 gpm		
Captstans	10 total: 1 at head, 1 each side of entrance, 30 fpm at 24k; 4 port side, 3 starboard side, 30 fpm at 12k		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	78 lg tons	117’	
Auxiliary	30 lg tons	136’	
Whip	6 lg tons	139' 10", 69’ min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	460	22,800	2 stbd and 4 port at 400 amps, 2 stbd and 2 port at 2,000 amps. 1 port at 4,800 amps. 1 port at 8,000 amps 16 north side and 38 south side at 400 amps
Fresh water	8" starboard and 12" port side mains, 1,500 gpm at 65 psi, 12 2-1/2" outlets port side, four 2-1/2" outlets starboard side		
Saltwater	12" starboard and 12" port side mains, 8,700 gpm at 125 psi, forty-eight 2-1/2" outlets port side, thirty-two 2-1/2" outlets starboard side. 6" header at dock floor with outlets.		
Fire Protection	Same as salt water, except pressure boosted to 150 psi		
Compressed Air	4" starboard and 6" port side mains, 10,000 cfm at 100 psi, ten 1-1/4" and five 2-1/2" outlets port side, twelve 1-1/4" and six 2-1/2" outlets starboard side		
Sanitary Sewer	6" mains, twenty two 4” inlets each side on dock floor; two 500 gpm pumpwell sewage pumps		

Figure 15 Pearl Harbor Naval Shipyard Drydock No. 2

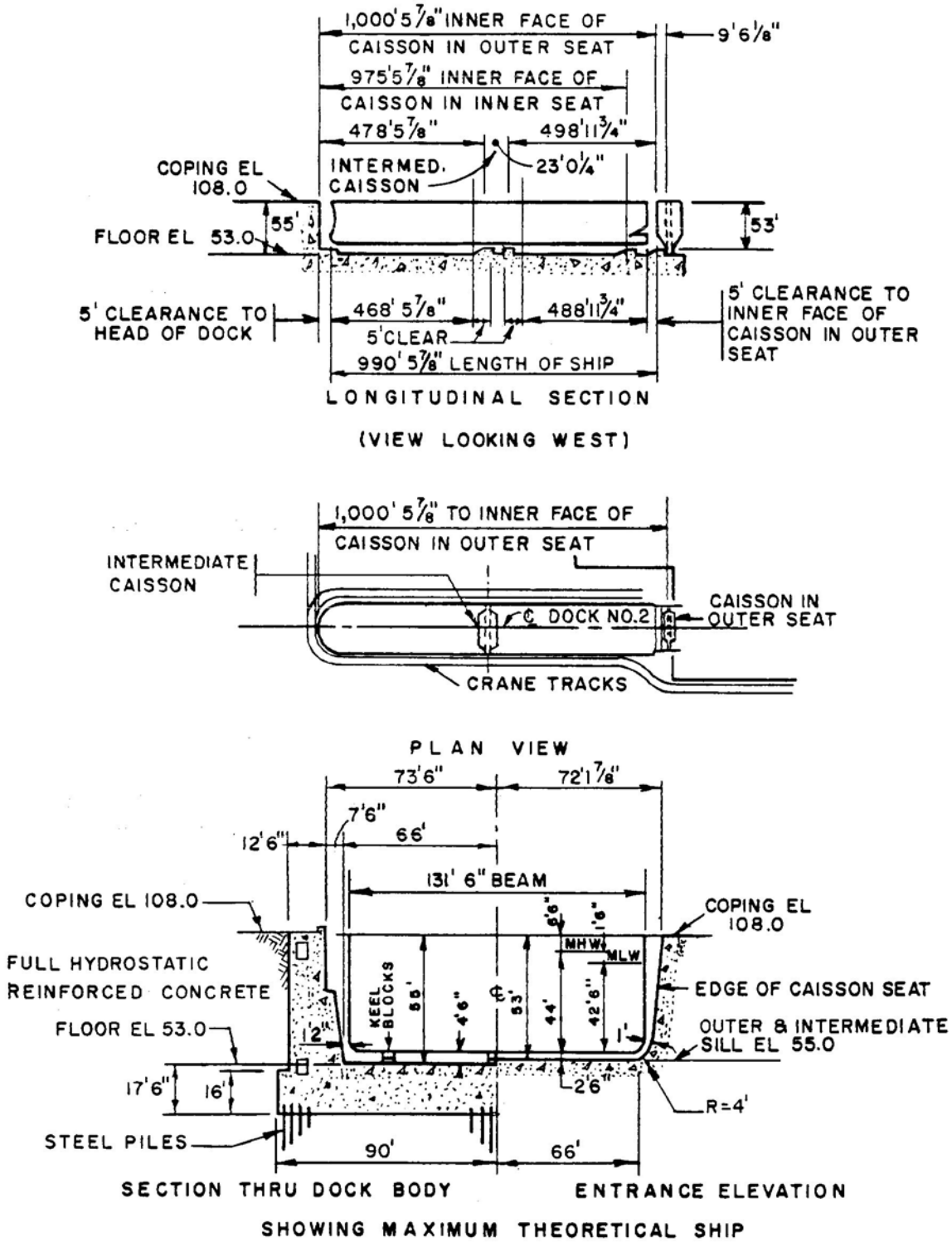


Table 12 Pearl Harbor Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1941	CVA	PIles	Concrete
Closure	Caisson, steel (rectangular box type). Also identical intermediate caisson available as spare		
Dewatering Pumps	Four 52", 1,250 hp, 520,000 gpm. Also connected to Drydock No. 1 pumphouse. Time to dewater: 90 min, aft section; 140 min. total dock		
Drainage Pumps	Two 16", 250 hp, 14,400 gpm; two 16", 200 hp, 12,000 gpm		
Flooding	Through culverts. Time to flood: 75 min, aft section; 90 min. total dock.		
Captstans	13 total: 1 at head, 1 each side of entrance, 30 fpm at 24k; 5 each side, 30 fpm at 12k		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main Auxiliary Whip	59 lg tons 30 lg tons 6 lg tons	112’ 7" 132' 9" 136' 8", 69’ min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	460	21,200	3 port at 400 amps 5 stbd at 600 amps 1 stbd and 2 port at 2000 amps 2 port at 4880 amps 1 stbd and 1 port at 1600 amps
Fresh water	6" mains, 2,800 gpm at 65 psi, twelve 2-1/2" outlets each side		
Saltwater	12" mains, 8,700 gpm at 125 psi, forty-eight 2-1/2" outlets each side, 4" header at dock floor with outlets		
Fire Protection	Same as salt water, except pressure boosted to 150 psi		
Seawater Cooling	16" main, 8,000 gpm at 25 psi, four 12" outlets port side.		
Compressed Air	6" mains, 10,000 cfm at 100 psi, six 2-1/2" and twelve 1-1/4" outlets each side.		
Sanitary Sewer	6” main, two 14” inlets at 6 service galleries each side, Connects directly into sanitary sewer system		

Figure 16 Pearl Harbor Naval Shipyard Drydock No. 3

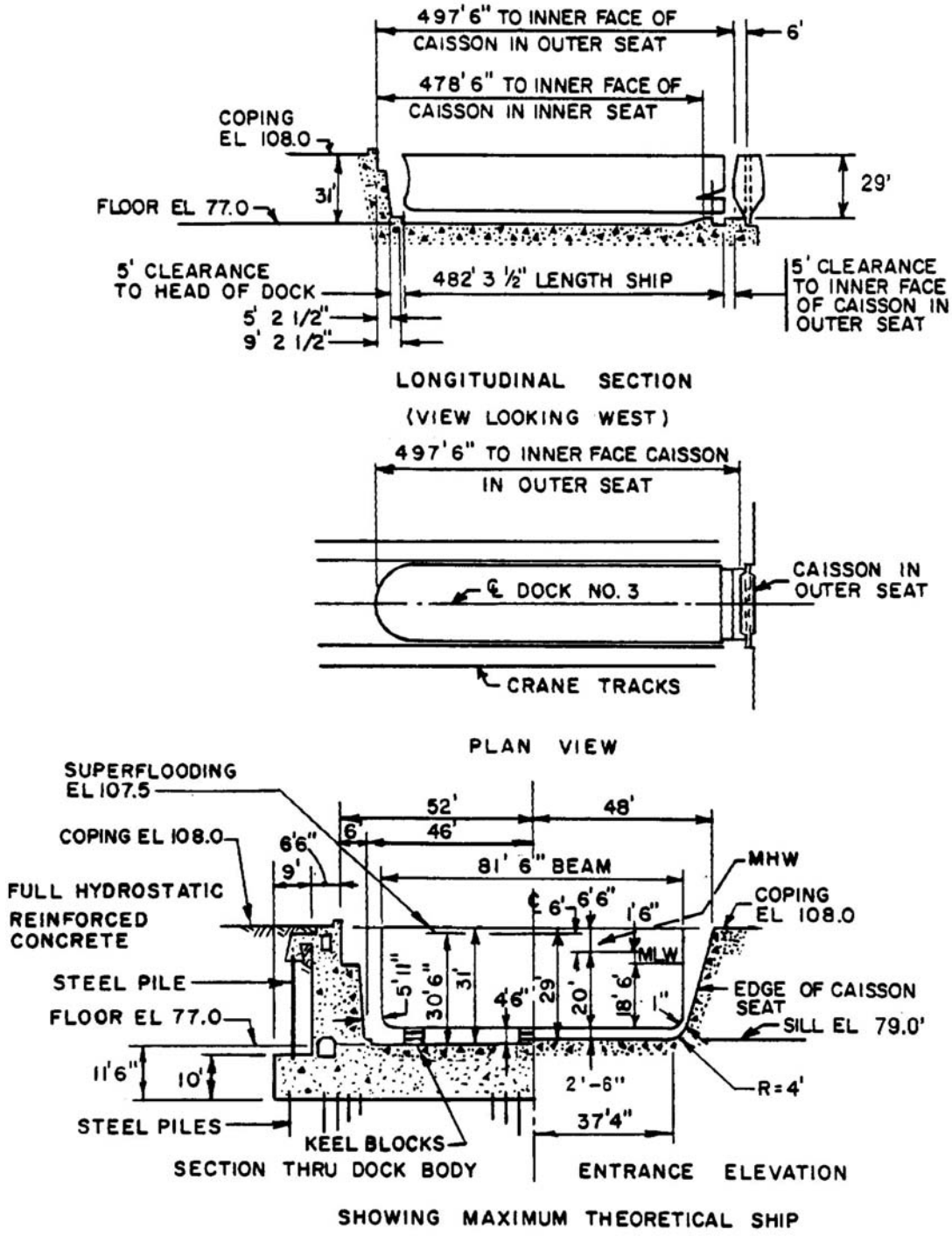


Table 13 Pearl Harbor Naval Shipyard Drydock No. 3

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	DD, SSBN	PIles	Concrete
Closure	Caisson, steel (rectangular box type).		
Dewatering Pumps	Dewatered by Drydock No. 1 or 2 pumps. Time to dewater: 40 min		
Drainage Pumps	One 10", 75 hp, 3,000 gpm. Drydock No. 2 pumps also used		
Flooding	Through culverts. Time to flood: 45 min. Super-flooding pumps: three 12", 100 hp, 19,500 gpm.		
Captstans	5 total: 1 at head, 30 fpm at 24k; 1 each side of entrance, 1 each side, 30 fpm at 12k		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main Auxiliary Whip	119 lg tons 30 lg tons 6 lg tons	125' 2" 142' 1" 145' 11", 69’ min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	460	8,000	3 stbd and 2 port at 400 amps. 1 stbd at 1,600 amps. 1 stbd at 4,800 amps
Fresh water	6" mains, 1,050 gpm at 65 psi, three 2-1/2" outlets each side		
Saltwater	8" mains, 8,700 gpm at 125 psi, twelve 2-1/2" outlets each side, 4" header at dock floor with outlets		
Fire Protection	Same as salt water, except pressure boosted to 150 psi		
Compressed Air	4" main, 10,000 cfm at 100 psi, three 2-1/2" outlets each side, six 1-1/4" outlets each side		
Sanitary Sewer	Two 4” inlets at 3 service galleries on port side, connects Directly into sanitary sewer system		

Figure 17 Pearl Harbor Naval Shipyard Drydock No. 4

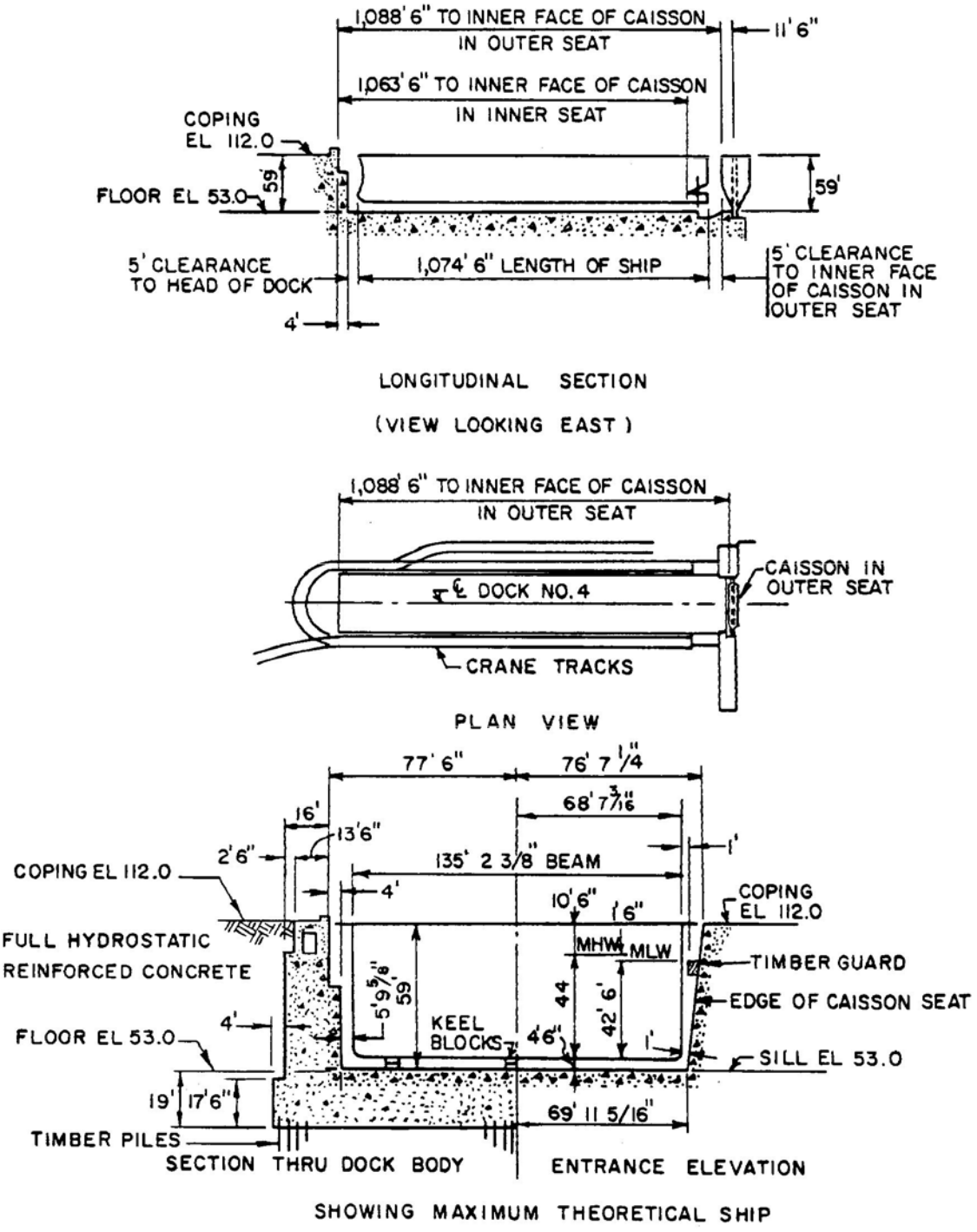


Table 14 Pearl Harbor Naval Shipyard Drydock No. 4

Date Completed	Suitable for Docking	Foundation	Construction Material
1943	CVN	PIles	Concrete
Closure	Caisson, steel (rectangular box type).		
Dewatering Pumps	Four 63", 1,250 hp, 668,000 gpm. Time to dewater: 190 min		
Drainage Pumps	Two 12", 150 hp, 10,000 gpm		
Flooding	Through culverts. Time to flood: 120 min		
Captstans	13 total: 1 at head, 1 each side of entrance, 30 fpm at 24k; 5 each side, 30 fpm at 12k		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main Auxiliary Whip	36 lg tons 30 lg tons 6 lg tons	109' 4" 130' 4" 134' 5", 69’ min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	460	15,200	4 stbd and 3 port at 400 amps. 1 port at 1,600 amps. 2 port and 2 stbd at 2,000 amps 2 port at 4,800 amps
Fresh water	6" mains, 2,100 gpm at 65 psi, twelve 2-1/2" outlets each side		
Saltwater	14" mains, 10,600 gpm at 125 psi, forty-eight 2-1/2" outlets each side, 8" headers at dock floor with outlets		
Fire Protection	Same as salt water, except pressure boosted to 150 psi		
Compressed Air	6" mains, 10,000 cfm at 100 psi, six 2-1/2" and twelve 1-1/4" outlets each side. 4" headers at dock floor with outlets		
Sanitary Sewer	8” mains, twenty eight 4” inlets each side on dock floor, two 450 gpm pumpwell sewage pumps		

Table 15 Pearl Harbor Naval Shipyard Drydock Portal Cranes

Drydock Portal Cranes		
Crane No.	Drydock No.	Capacity (lg tons)
P68, P71	1,2,3,4	25, 5
P59, P63	1,2,3,4	30, 5
P67	1,2,3,4	50
P74	1,2,3,4	153, 30, 6
P75, P76	1,2,3,4	53, 13

Figure 18 Location of Drydocks, Portsmouth Naval Shipyard, Portsmouth, NH

Drydock Portal Cranes

Crane No.	Drydock No.	Capacity (lg tons)
20,22	1,3	50,15,5
21	2	50,15,5
23,24, 25,26, 27	1,3	25,5
28	2	60,15
29	2	25,5
30	1,2,3	17.8

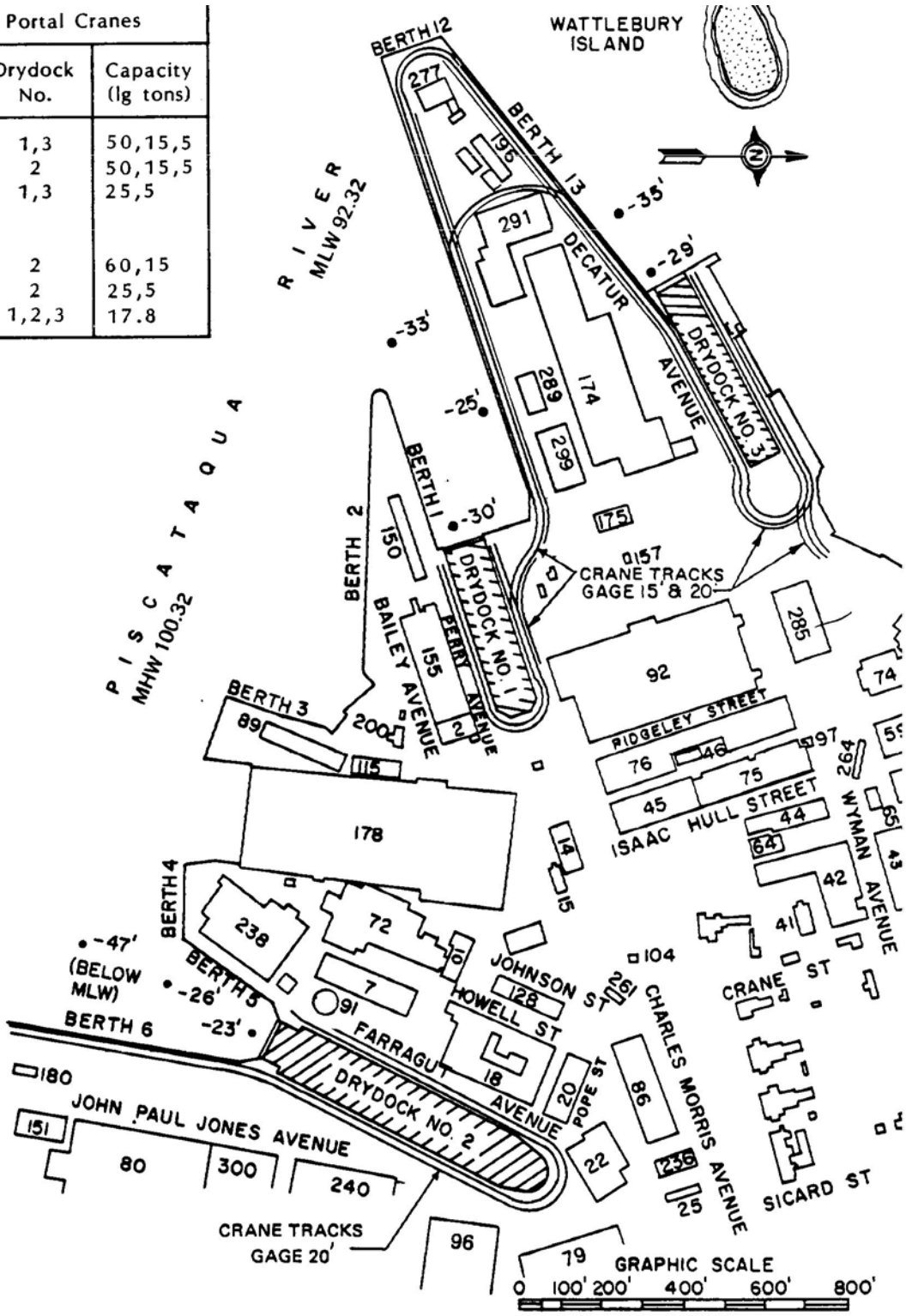


Figure 19 Portsmouth Naval Shipyard Drydock No. 1

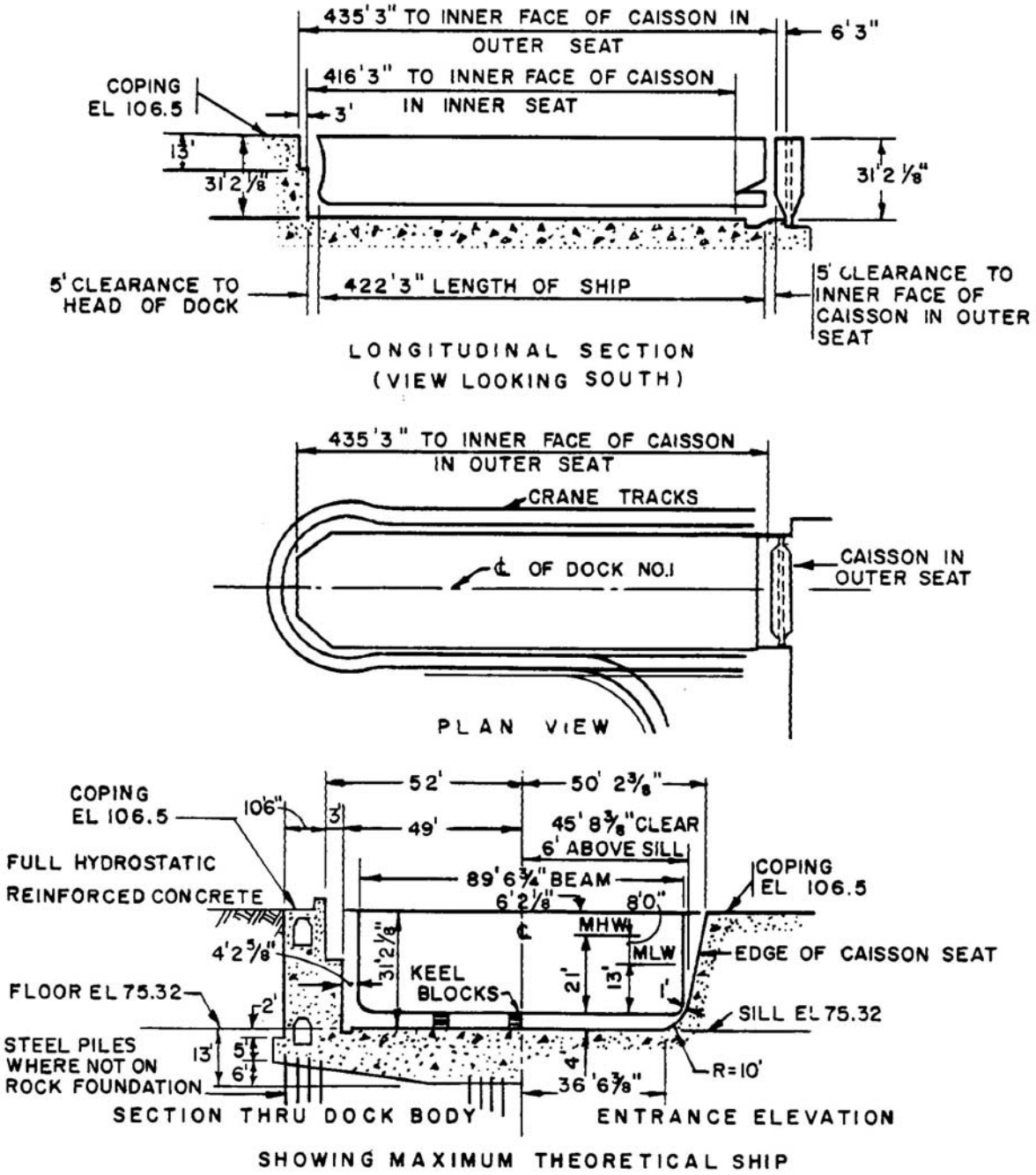


Table 16 Portsmouth Naval Shipyard Drydock No. 1

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	SSN	Rock or Piles	Concrete

Closure	Caisson, steel (rectangular box type).
Dewatering Pumps	Two 48", 350 hp, 146,000 gpm. Time to dewater: 75 min
Drainage Pumps	Two 16", 150 hp, 14,000 gpm
Flooding	Through culverts. Time to flood: 75 min
Captstans	6 total: 1 at head, 30 fpm at 24k; 1 each side of entrance, 1 each side, 1 at east end of Berth II, 30 fpm at 12k

Portal Crane Maximum Capacities and Heights

Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline
Main	54 lg tons	150’
Auxiliary	15 lg tons	145'10"
Whip	13 lg tons	154' 0", 59’ min radius

Ship and Industrial Services Furnished at Dock

Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz UNG	480	2500	2 north (transportable) exhibit 2.1F
Ac, 3 Ph, 60 Hz UNG	480	1600	2 north (transportable) exhibit 2.1F
DC, 2P, UNG	0-375	1600	2 north (permanent) exhibit 2.1F
Ac, 3 Ph, 60 Hz GRD	480	400	10 north permanent – exhibit 2.1E
Ac, 3 Ph, 60 Hz GRD	480	400	10 south permanent – exhibit 2.1E
Ac, 3 Ph, 60 Hz GRD	480	800	1 north permanent – exhibit 2.1E
Ac, 3 Ph, 60 Hz GRD	480	600	1 south permanent – exhibit 2.1E
Emergency Gen	480	300	1 at pumpwell no 1 – exhibit 2.1G

Fresh water	6" mains, 400 gpm at 65 psi, three 4" outlets each side.
Saltwater	6" mains, 1,000 gpm at 100 psi, two 2 ½” outlets north side, One 3” outlet south side
Fire Protection	Pumped from freshwater system, one 4” outlet north side
Compressed Air	6" mains, 100 psi, three 4” outlets north side, four 4” outlets South side
Low pressure steam	3” south and 4” north side mains, 4250 pph at 100 psi, four 2” outlets north side, four 2” outlets south side
Oxygen	1 ½” mains, 110 psi, three ¾” outlets each side
Sanitary sewer	4" south side main,200 gpm, one 4" inlet
MAPP gas	1 ½” mains, 15 psi, three ¾” outlets each side

Figure 20 Portsmouth Naval Shipyard Drydock No. 2

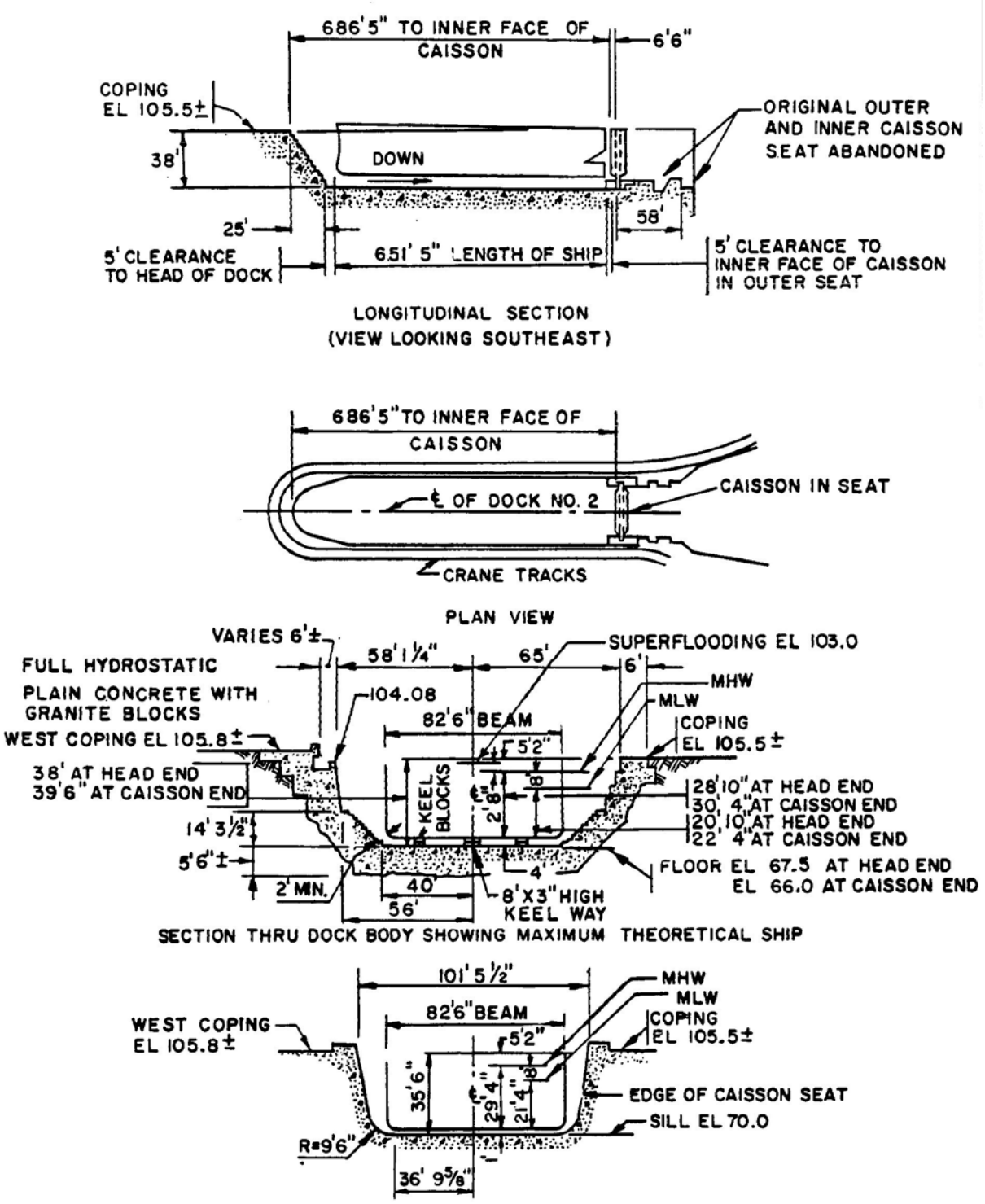


Table 17 Portsmouth Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1905	SSBN	Rock	Concrete and granite

Closure	Caisson, steel (rectangular box type).
Dewatering Pumps	Three 45", 600 hp, 210,000 gpm. Time to dewater: 150 min
Drainage Pumps	Two 14", 75 hp, 10,000 gpm
Flooding	Through caisson. Time to flood: 75 min. Superflooding pumps: two 30:, 125 hp, 20,000 gpm
Captstans	8 total: 4 each side, 30 fpm at 24k. 3 winches: 1 at head, 1 each side of entrance, 15 fpm at 20k

Portal Crane Maximum Capacities and Heights

Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline
Main	54 lg tons	150' 0"
Whip	13 lg tons	154' @ 59' min radius

Ship and Industrial Services Furnished at Dock

Electrical	Volts	Amp	Circuits
Ac, 3 Ph, 60 Hz GRD	480	400	13 west, 10 east (permanent) – exhibit 2.2E
Ac, 3 Ph, 60 Hz UNG	480	2500	4 west (2 transport, 2 perm) – exhibit 2.2F
Ac, 3 Ph, 60 Hz UNG	480	1600	2 west – exhibit 2.2F
DC, ungrounded	0-375	3000	2 west (permanent) – exhibit 2.2G
DC, undgrounded	0-375	4000	2 west (transportable) – exhibit 2.2G
Emergency Diesel	480	300	1 at pumpwell no 2 – exhibit 2.2H

Fresh water	12" west and 16" east side mains, 65 psi, six 2-1/2" outlets east side, twelve 2-1/2" outlets west side.
Fire Protection	10"pumped main from freshwater system, four 4" Connections east side, 65 psi, twelve 2 ½" connections West side
LP Air	6" mains, 100 psi, six 4" outlets, four 3" outlets west side
HP Air	Two 1" west side mains, 4,500 psi, six 1" outlets
LP steam	3" east & 4" west side mains, 4250 pph at 100 psi, four 4" Outlets west side, six 2" outlets east side
Nitrogen (5000 psi)	3/4" main, two ½" connections east side
Nitrogen (100 psi)	4" main, two 2 ½" connections east side
Sanitary sewer	4" east side main, 200 gpm, two 4" inlets
Argon	1" main, two ½" outlets east side
Saltwater	6" main, four 2 ½" outlets west side, three pumps, 620 gpm Each, 85 psi
Wheeler Vacuum	4" main, three 2 ½" connections east side
Chilled Water	6" supply & return mains, two each 2 ½" supply and return Connections each side
Hydraulic Flushing Oil	4" supply and return mains, two each 2" supply and return Connections east side
Pure Water	2 ½" main, two x three 1" connections east side

Figure 21 Portsmouth Naval Shipyard Drydock No. 3

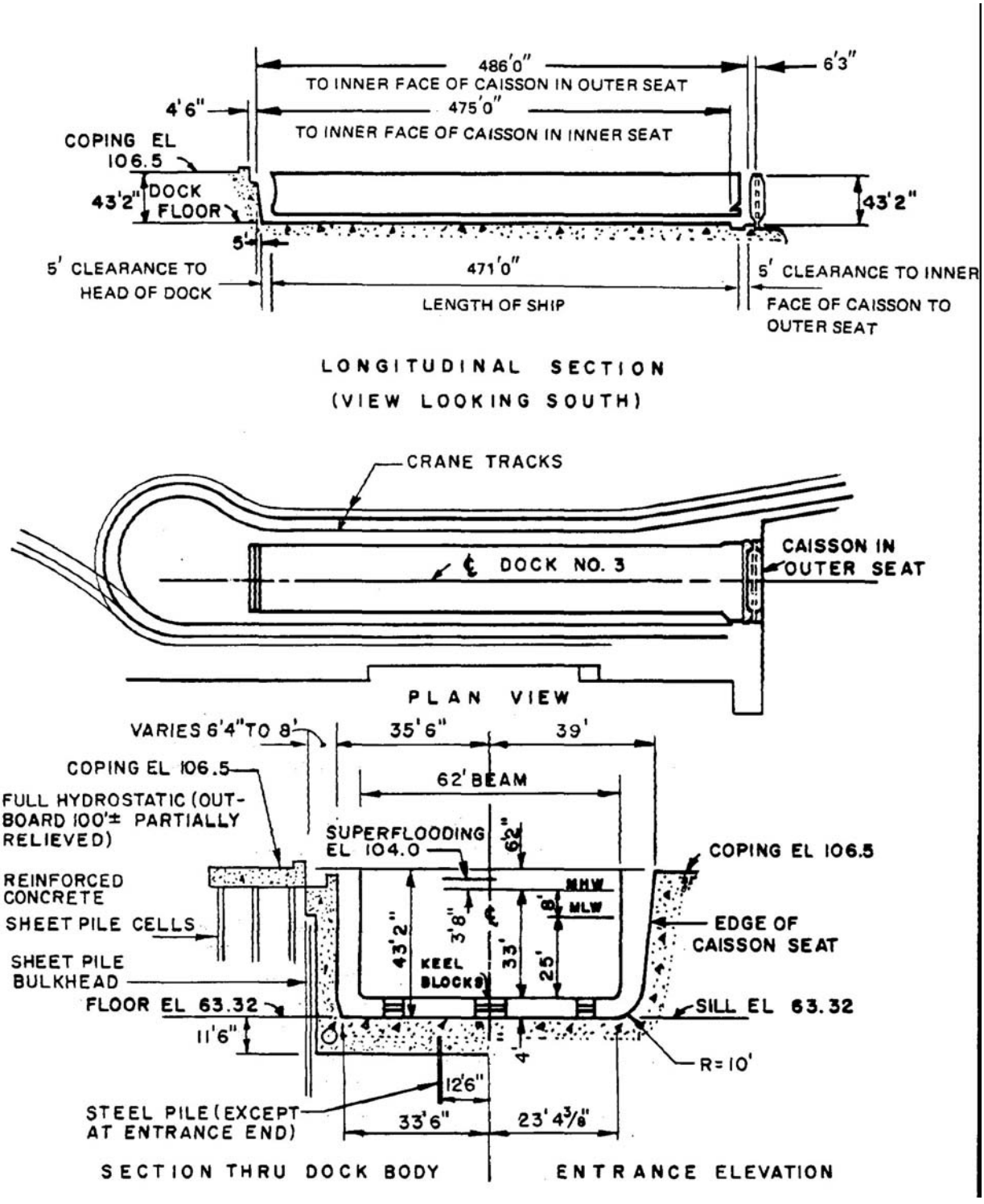
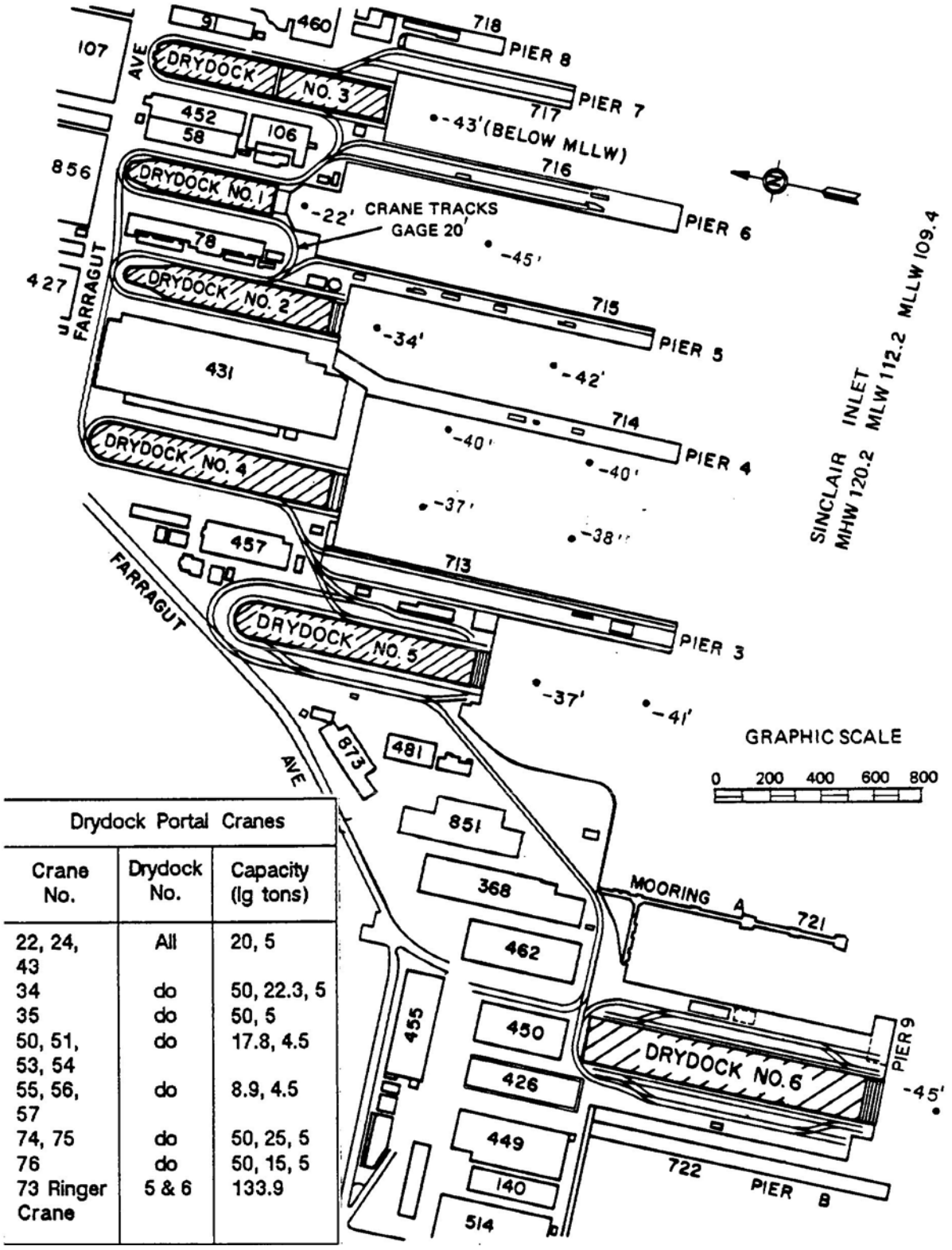


Table 18 Portsmouth Naval Shipyard Drydock No. 3

Date Completed	Suitable for Docking	Foundation	Construction Material
1962	SSBN	Rock or piles	Concrete
Closure	Caisson, steel (rectangular box type).		
Dewatering Pumps	Two 36", 300 hp, 60,000 gpm. Time to dewater: 185 min		
Drainage Pumps	Two 8", 40 hp, 3,000 gpm		
Flooding	Through culverts. Time to flood: 120 min. Superflooding pumps: two 24", 50 hp, 20,000 gpm		
Captstans	5 total: 1 at head, 30 fpm at 24k; 1 south side of entrance, 1 north side and 2 south side, 30 fpm at 12k. 1 winch; north side of entrance, 30 fpm at 12k		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	124'6"	
Auxiliary	15 lg tons	148'11"	
Whip	5 lg tons	144'10", 65'6" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	460	8,400	1 north at 2200A; 1 south at 4000A
Ac, 3 Ph, 60 Hz	460	3,000	2 north, 6 south at 400A; 1 north at 800A.
Dc	375	4,000	2 south at 2,000A
Fresh water	4" south and 6" north side mains, 400 gpm at 65 psi, five 2-1/2" outlets north side, ten 2-1/2" outlets south side. 4" headers at dock floor with outlets		
Pure water	Two 1-1/2" south side mains, 60 psi, twelve outlets		
Salt water	6" and 8" main, 2,500 gpm at 90 psi, ten 2-1/2" outlets north side. 4" headers at dock floor with outlets		
Fire Protection	Same as salt water and fresh water		
LP Air	4" north and 6" south side mains, 100 psi, nine 2" outlets north side, 2-1/2" and two 2" outlets south side. 4" headers at dock floor with outlets		
HP Air	1" main, 4,500 psi, four 1/2" outlets south side		
LP steam	2" north and 6" south side mains, 7,400 phr at 100 psi, ten 1-1/2" outlets north side, one 4", eight 2-1/2" and one 1-1/2" outlets south side		
HP steam	6" main, 600 psi, one 6" outlet south side		
Oxygen	1-1/2" mains, 110 psi, five 3/4" outlets each side		
Sanitary sewer	4" south side main, 200 gpm, one 4" inlet		
MAPP gas	1-1/2" mains, 15 psi, five 3/4" outlets each side		

Figure 22 Location of Drydocks, Puget Sound Naval Shipyard, Bremerton Washington



Drydock Portal Cranes		
Crane No.	Drydock No.	Capacity (lg tons)
22, 24, 43	All	20, 5
34	do	50, 22.3, 5
35	do	50, 5
50, 51, 53, 54	do	17.8, 4.5
55, 56, 57	do	8.9, 4.5
74, 75	do	50, 25, 5
76	do	50, 15, 5
73 Ringer Crane	5 & 6	133.9

Figure 23 Puget Sound Naval Shipyard Drydock No 1

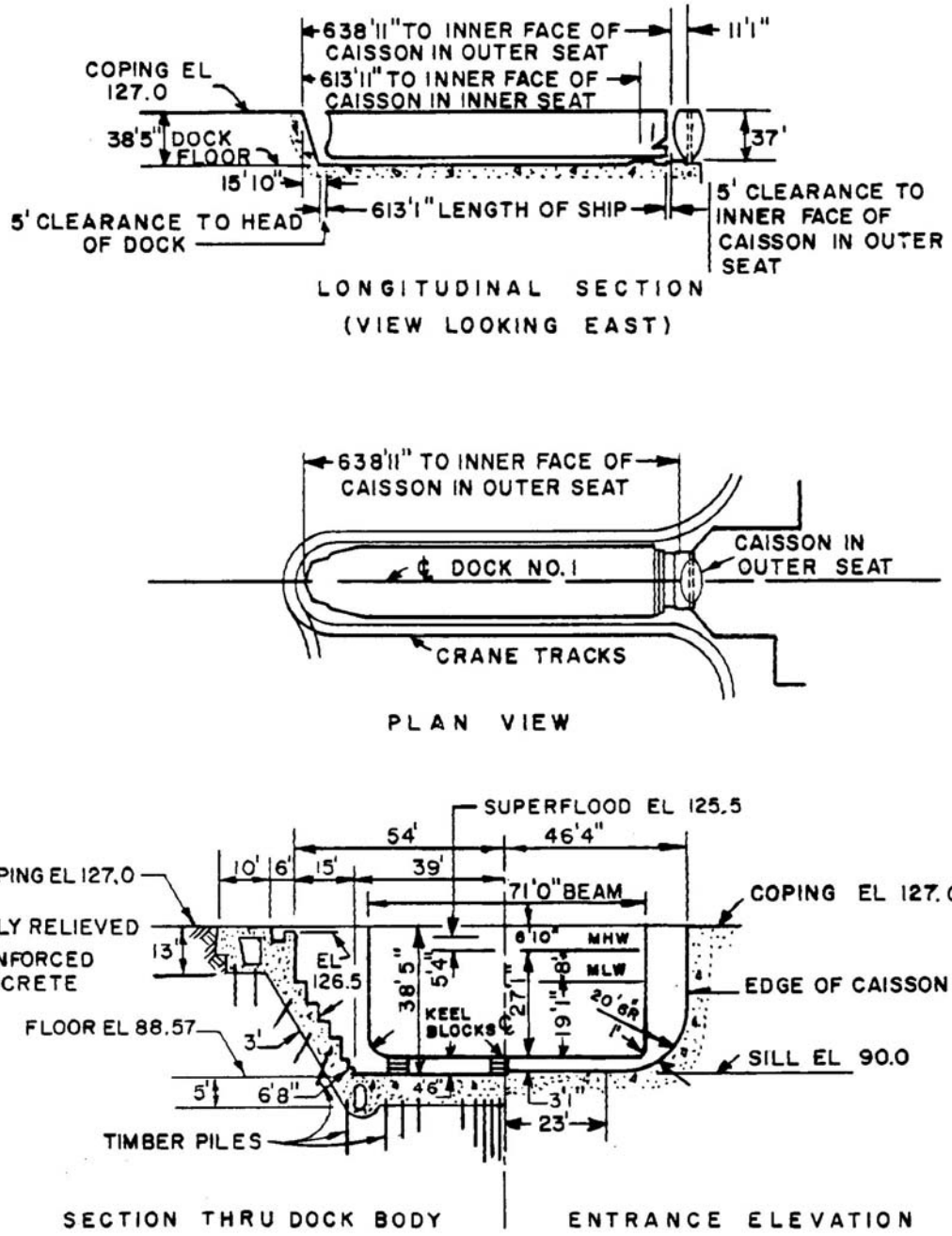
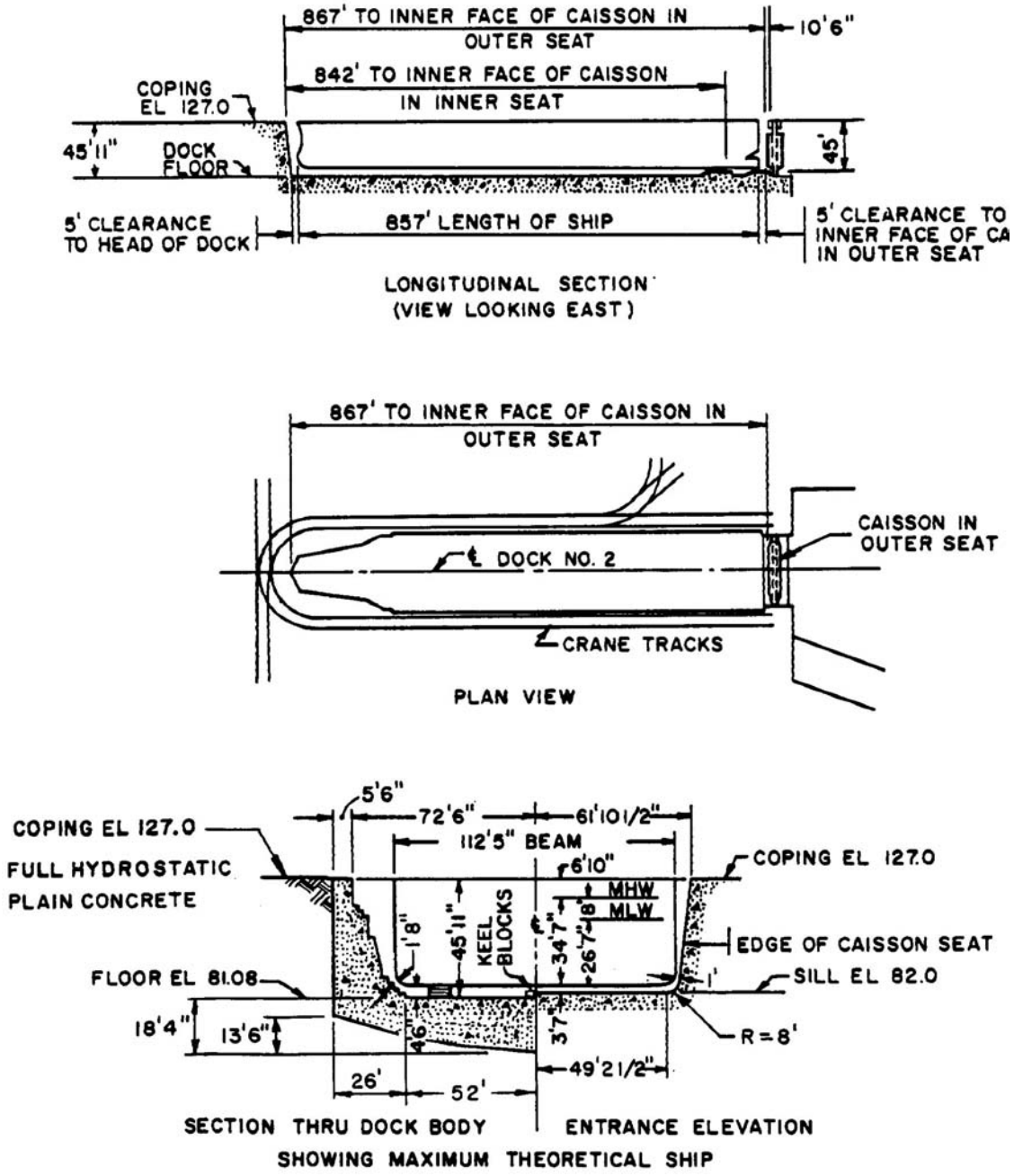


Table 19 Puget Sound Naval Shipyard Drydock No. 1

Date Completed	Suitable for Docking	Foundation	Construction Material
1931	SSN, SSBN	Piles	Concrete
Closure	Caisson, steel (ship type).		
Dewatering Pumps	Four 54", 550 hp, 320,000 gpm total (Pumphouse No. 2). Time to dewater: 90 min		
Drainage Pumps	Two 15", 85 hp, 9,750 gpm total (Pumphouse No. 2). Drydock No. 4 or 5 drainage pumps normally used		
Flooding	Through caisson. Time to flood: 105 min. Superflooding pumps: two 36", 75 hp, 30,000 gpm		
Captstans	6 total: 1 at head, 1 each side of entrance, 1 east side, 1 west side, 30 fpm at 1 2k; 1 west side, 30 fpm at 24k		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main Whip	151/60 tons 15 tons	112'/148' @ 60' R 157' @ 66' R	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz Ac, 3 Ph, 60 Hz Ac, 3 Ph, 60 Hz	460 460 460	4,800 1,600 1,200	2 west side at 2,400 amps 1 west side at 1,600 amps 2 west side at 1,200 amps
Fresh water_____6" mains, 1,000 gpm at 80 psi, eight 2-1/2" outlets and one 4" outlet each side			
Pure water _____ 1-1/2" main, 100 gom @ 80 psig, two 1-1/2" outlets west side			
Salt water_____ _8" east and 12" west side mains, 4,200 gpm at 100 psi, sixteen 4" outlets each side, eight 2-1/2" outlets each side			
Fire Protection _____Same as saltwater			
Compressed Air_____10", 6", and 3-1/2" mains, 4,000 cfm at 80 psi, eight 2" outlets each side. 2" headers at dock floor with outlets			
Steam___ _____ 2-1/2" east, 2-1/2" and 3" west side mains, 20,000 phr at 110 psi, eight 2" outlets each side			
Oxygen _____2" mains, 1,100 cfm at 100 psi, seven 1" outlets each side			
Sanitary sewer _____8" mains, 500 gpm, eight 4" inlets each side			

Figure 24 Puget Sound Naval Shipyard Drydock No 2

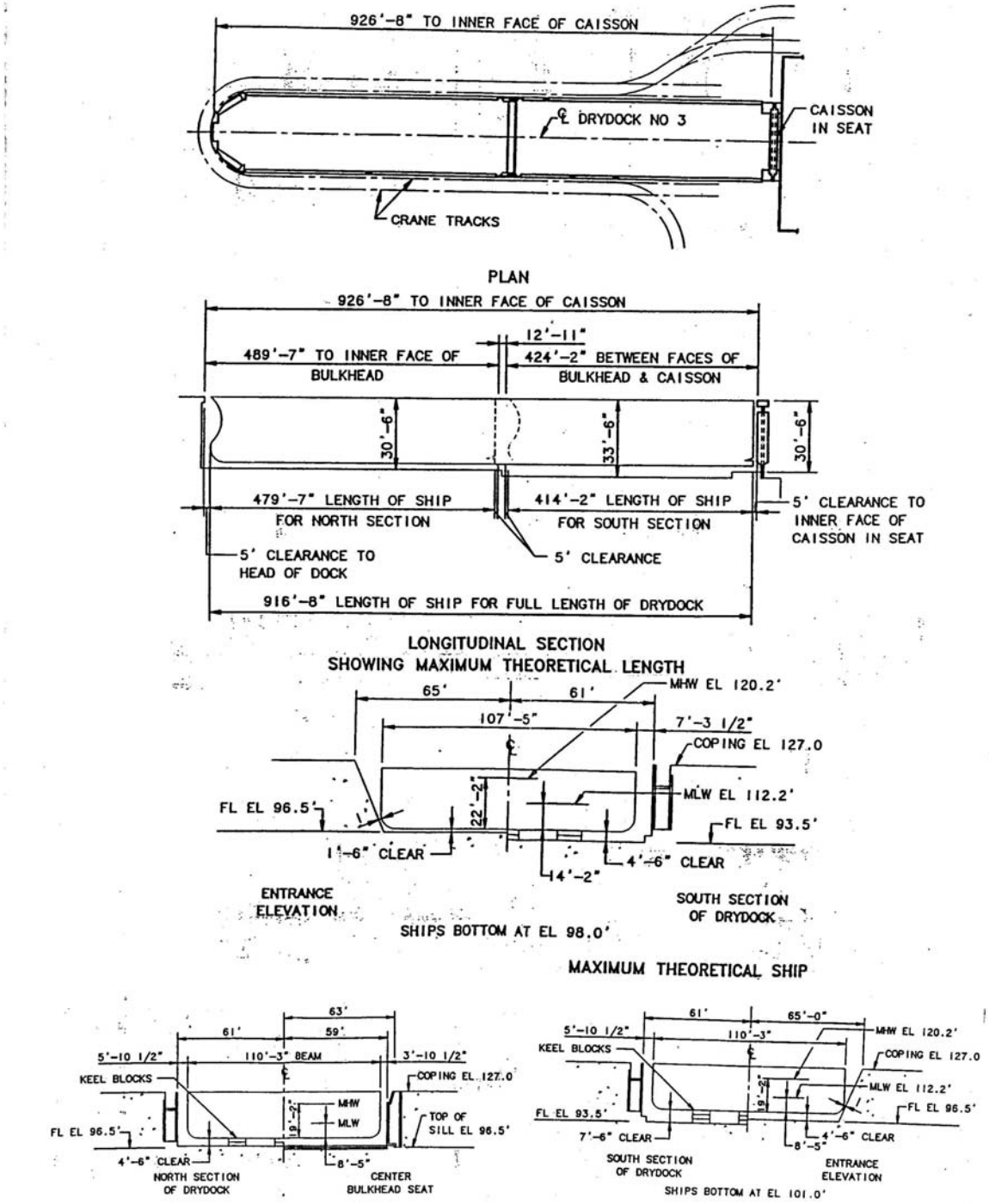


NOTE: Superflood = 125.5 ft

Table 20 Puget Sound Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1911	SSN, SSBN	Earth	Granite and Concrete
Closure	Caisson, steel (hydrometer type).		
Dewatering Pumps	Four 54", 550 hp, 320,000 gpm total. Pumps also used for Drydock No. 1 and 3. Time to dewater: 165 min		
Drainage Pumps	Two 15", 85 hp, 9,750 gpm total (Pumphouse No. 2). Drydock No. 4 or 5 drainage pumps normally used		
Flooding	Through caisson. Time to flood: 75 min		
Captstans	8 total: 1 at head, 12 fpm at 35k; 1 each side of entrance, 3 east side, 2 west side, 12 fpm at 17k		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main Whip	142/60 tons 15 tons	108'/142' @ 70' R 153' @ 76' R	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz Ac, 3 Ph, 60 Hz Ac, 3 Ph, 60 Hz	460 460 460	4,800 2,400 1,600	2 west side at 2,400 amps 1 west side at 2,400 amps 2 east side at 1,600 amps
Fresh water	8" mains, 3,000 gpm at 80 psi, sixteen 2-1/2" outlets each side		
Pure water	1-1/2" main, 80 gpm at 80 psi, one 1-1/2" outlet west side		
Salt water	12" mains, 4,200 gpm at 100 psi, twenty-four 4" outlets each side		
Fire Protection	Same as salt water, plus two 2-1/2" outlets each side		
Compressed Air	4" and 6" east and 6" west side mains, 9,000 cfm at 80 psi, two 2", six 1-1/2" and three 1-1/4" outlets east side, twenty-four 1-1/2" outlets west side. 2" headers at dock floor with outlets		
Steam	6" mains, 30,000 phr at 110 psi, eleven 2" outlets each side, one 1-1/2" and one 3/4" outlet west side		
Oxygen	2-1/2" mains, 1,300 cfm at 100 psi, six 1" outlets each side		
Sanitary sewer	8" mains, 500 gpm, twelve 4" inlets each side		

Figure 25 Puget Sound Naval Shipyard Drydock No 3



NOTE: Superflood = 125.5 ft

Table 21 Puget Sound Naval Shipyard Drydock No. 3

Date Completed	Suitable for Docking	Foundation	Construction Material
1919	DD, SS	Earth	Concrete
Closure	Caisson, steel (hydrometer type). Removable intermediate bulkhead, steel and timber		
Dewatering Pumps	Four 54", 550 hp, 320,000 gpm total. (Pumphouse No. 2). Time to dewater: 90 min. south section; 165 min, total		
Drainage Pumps	Two 8", 50 hp, 5,000 gpm total. (Pumphouse 3A-North); two 14", 75 hp, 5,000 gpm total. (Pumphouse 3-South). Drydock No. 4 or 5 drainage pumps normally used		
Flooding	Through culverts. Time to flood: 60 min, south section; 120 min, total dock		
Captstans	4 total: 1 each side of entrance, 1 each side, 30 fpm at 12k		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main Whip	142.5/60 tons 15 tons	108'/142' @ 70' R 153' @ 76' R	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz Ac, 3 Ph, 60 Hz Ac, 3 Ph, 60 Hz	460 460 460	1,200 800 1,200	2 east side at 600 amps 2 west side at 800 amps 3 east side at 400 amps. 400 1 west side at 400 amps
Fresh water	6" west and 4" east side mains, 1,200 gpm at 80 psi, nine 2-1/2" outlets each side		
Salt water	10" mains, 4,200 gpm at 100 psi, eighteen 2-1/2" outlets east side, thirty-six 4" outlets west side		
Fire Protection	Same as salt water		
Compressed Air	6" west, 8" and 6" east side mains, 10,000 cfm at 80 psi, nine 4" outlets each side. 4" headers at dock floor with outlets		
Steam	3" main, 18,000 phr at 80 psi, five 2" outlets west side		
Oxygen	2" mains, 1,100 cfm at 100 psi, nine 1" outlets each side		
Sanitary sewer	6" mains north section, nine 6" inlets each side; 8" mains south section, six 4" inlets each side.; 500 gpm		

Figure 26 Puget Sound Naval Shipyard Drydock No 4

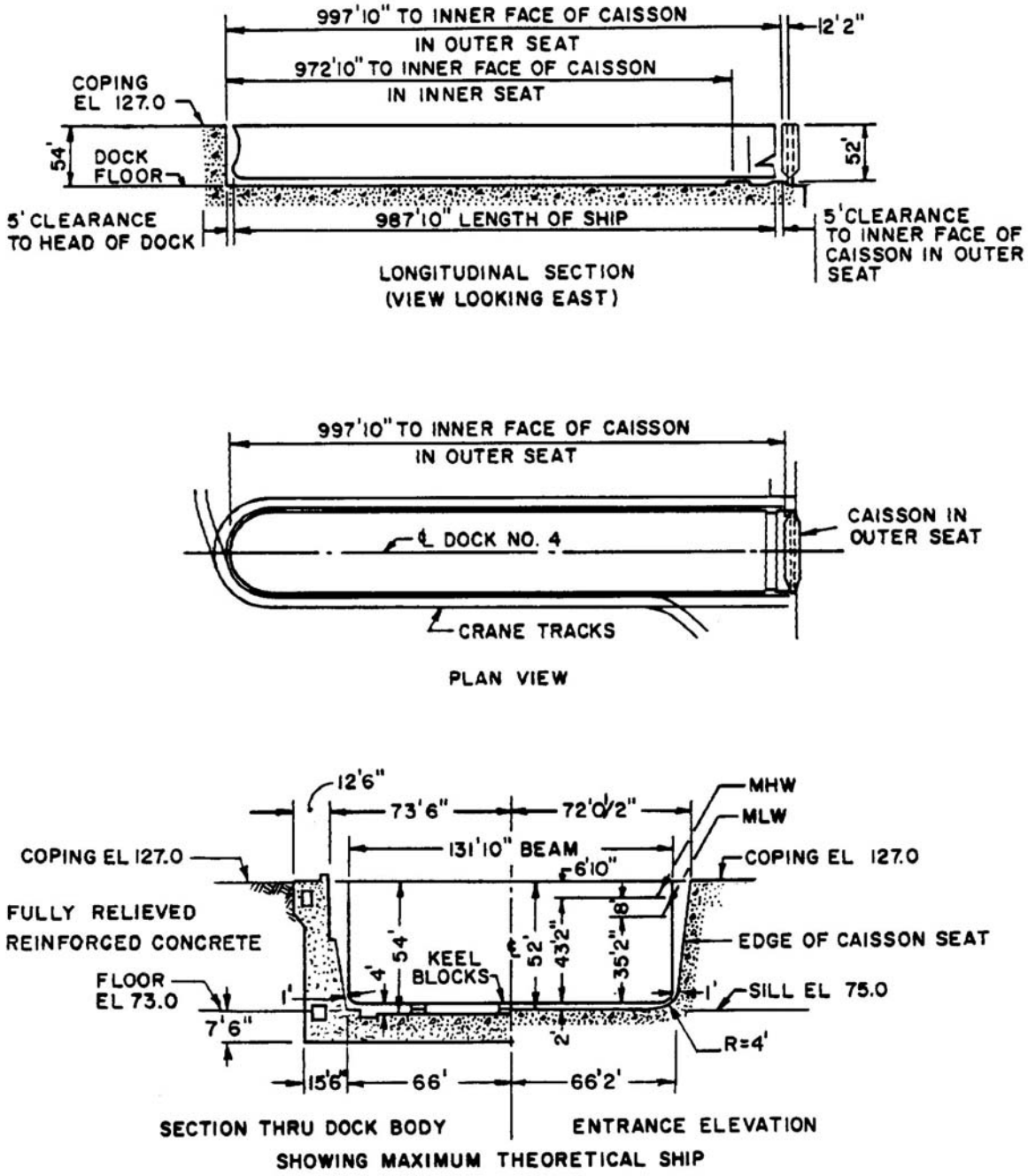


Table 22 Puget Sound Naval Shipyard Drydock No. 4

Date Completed	Suitable for Docking	Foundation	Construction Material
1940	SSN, SSBN, AOE	Earth	Concrete
Closure	Caisson, steel (rectangular type). Spare caisson, steel (rectangular box type), also used for Drydock No. 5		
Dewatering Pumps	Three 54", 1,200 hp, 390,000 gpm total. Time to dewater: 195 min		
Drainage Pumps	Two 16", 250 hp, 14,400 gpm total		
Flooding	Through caisson. Time to flood: 90 min. When using spare caisson time to flood: 310 min.		
Captstans	13 total: 1 at head, 1 each side of entrance, 30 fpm at 24k; 2 each side, 10 fpm at 50k; 4 each side, 30 fpm at 12k		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main Whip	142.5/60 tons 15 tons	108'/142' @ 70' R 153' @ 76' R	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz Ac, 3 Ph, 60 Hz	460 460	4,800 2,400	2 east side at 2,400 amps 2 east side at 2,000 amps; 2 east side at 1,200 amps; 1 east side at 800 amps; 1 east side at 400 amps.
Fresh water	6" east and 8" west side mains, 2,200 gpm at 80 psi, ten 2-1/2" outlets each side		
Pure water	3" main, 100 gpm at 80 psi, one 1-1/2" outlets west side		
Salt water	12" main, 7,000 gpm at 100 psi, twenty-four 4" outlets each side		
Fire Protection	Same as salt water, plus four 2-1/2" outlets east side		
Compressed Air	6" mains, 8,000 cfm at 80 psi, twenty-four 1-1/4" outlets each side. 2-1/2" headers at dock floor with outlets		
Steam	6" east and 8" west side mains, 50,000 phr at 80 psi, twelve 2-1/2" outlets each side		
Oxygen	2" east and 3" west side mains, 1,350 cfm at 100 psi, six 1" outlets each side		
Sanitary sewer	8" mains, 500 gpm, twelve 4" inlets each side		

Figure 27 Puget Sound Naval Shipyard Drydock No 5

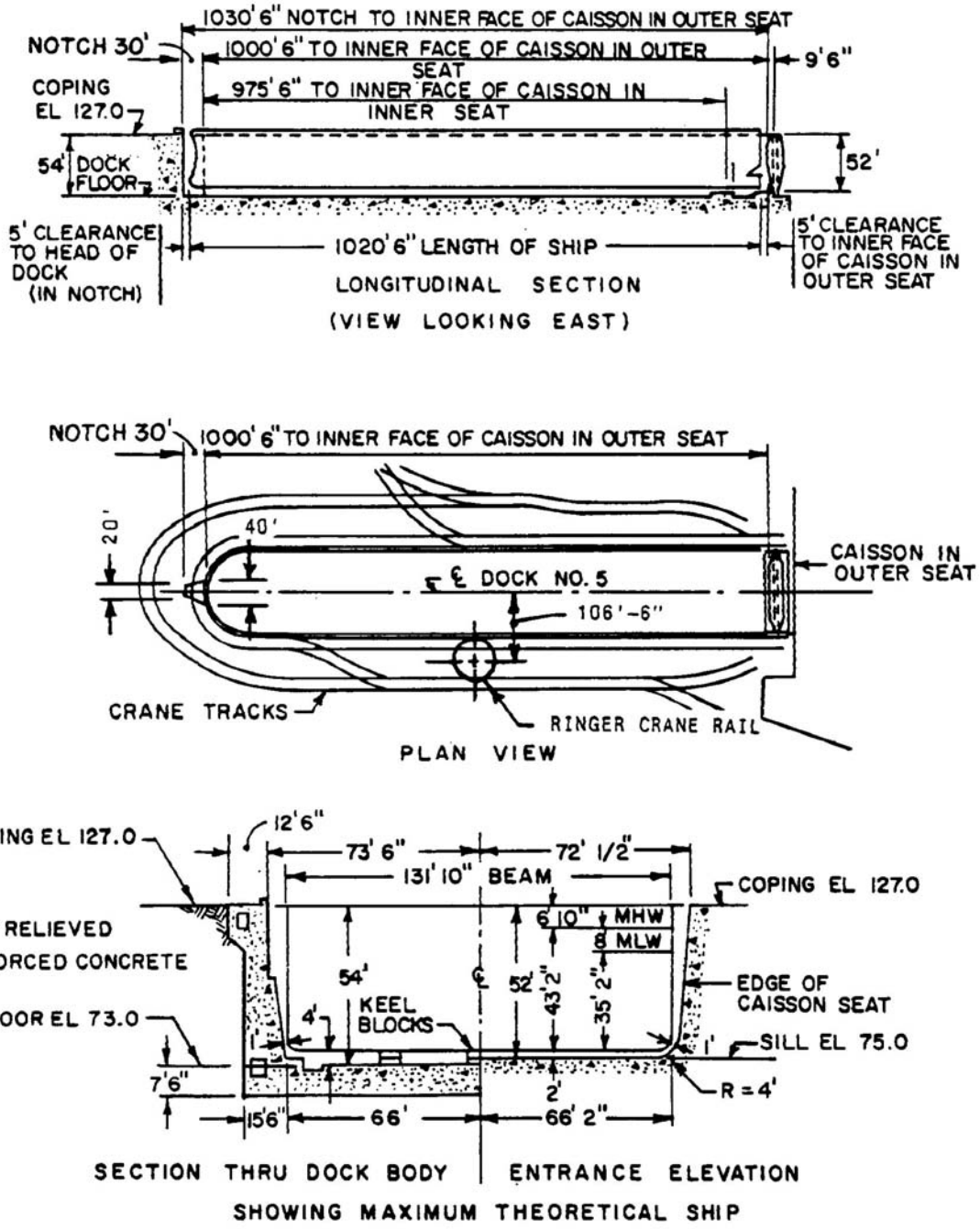


Table 23 Puget Sound Naval Shipyard Drydock No. 5

Date Completed	Suitable for Docking	Foundation	Construction Material
1941	SSN, SSBN, AOE	Earth	Concrete
Closure	Caisson, steel (rectangular box type). Spare caisson, steel (rectangular box type), also used for Drydock No. 4		
Dewatering Pumps	Three 54", 1,200 hp, 390,000 gpm total. Time to dewater: 195 min		
Drainage Pumps	Two 16", 250 hp, 14200 gpm total		
Flooding	Through culverts. Time to flood: 90 min		
Captstans	13 total: 1 at head, 1 each side of entrance, 30 fpm at 24k; 5 each side, 30 fpm at 12k		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main Whip	142.5/60 tons 15 tons	108'/142' @ 70' R 153' @ 76' R	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz Ac, 3 Ph, 60 Hz Ac, 3 Ph, 60 Hz Ac, 3 Ph, 60 Hz	460 460 460 460	8,000 4,800 4,800 3,500	2 west side at 4,000 amps 2 east side at 2,400 amps 2 east side at 2,400 amps East side: 1 at 2400 amps, 1 at 600 amps, 1 at 500 amps
Fresh water	3", 4" and 6" mains, 2,000 gpm at 80 psi, thirty-six 2-1/2" outlets each side		
Pure water	1-1/2" and 3" main, 100 gpm at psi, two 1-1/2" outlets east side; three 1-1/2" outlets west side		
Salt water	12" mains, 7,000 gpm at 100 psi, twenty-four 4" outlets each side.		
Fire Protection	Same as salt water, plus four 2-1/2" outlets east side		
Compressed Air	3", 4" and 6" mains, 8,000 cfm at 80 psi, twelve 2-1/2" outlets each side. 2-1/2" headers at dock floor with outlets		
Steam	4", 6" east and 8" west side mains, 37,000 phr at 80 psi, twelve 2-1/2" outlets each side		
Oxygen	2" west and 3" east side mains, 1,400 cfm at 100 psi, six 1" outlets each side		
Sanitary sewer	8" mains, 500 gpm, eighteen 6" and fourteen 4" inlets each side		

Figure 28 Puget Sound Naval Shipyard Drydock No. 6

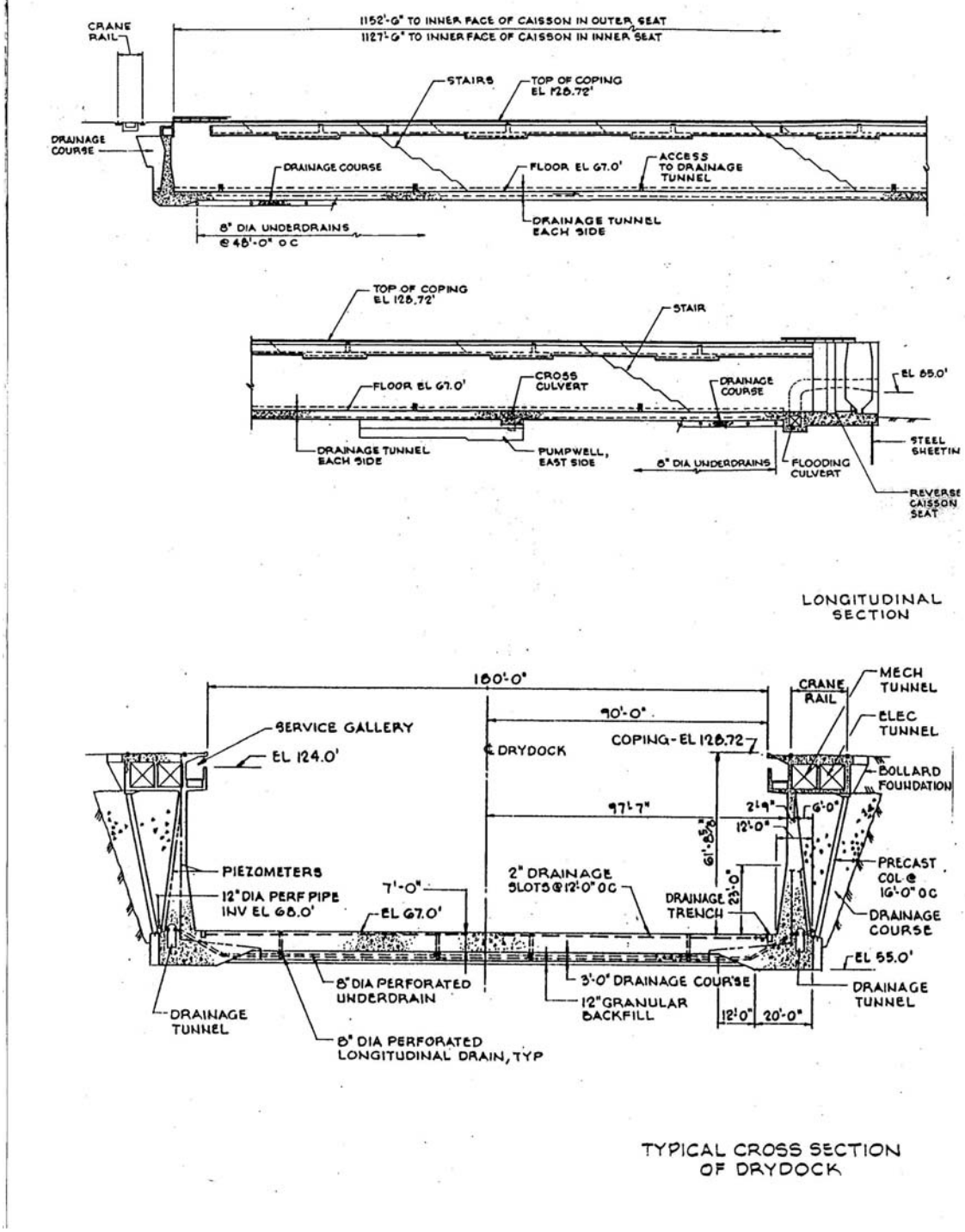


Table 24 Puget Sound Naval Shipyard Drydock No. 6

Date Completed	Suitable for Docking	Foundation	Construction Material
1962	CVA, CVN	Earth	Concrete
Closure	Caisson, steel (rectangular box type).		
Dewatering Pumps	Four 54", 1,500 hp, 456,000 gpm total. Time to dewater: 230 min		
Drainage Pumps	Three 20", 400 hp, 45,000 gpm total		
Flooding	Through culverts. Time to flood: 90 min		
Captstans	11 total: 1 at head, 1 each side of entrance, 30 fpm at 30k; 4 each side, 30 fpm at 15k		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main Whip	100/55 tons 15 tons	97'/137' 8" @ 90' R 122' 6.75" @ 110 R	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	4160	3,000	2 east side at 1,500 amps
Ac, 3 Ph, 60 Hz	460	8,000	2 east side at 4,000 amps
Ac, 3 Ph, 60 Hz	460	5,600	4 east side at 800 amps; 4 west side at 600 amps.
Ac, 3 Ph, 60 Hz	460	4,800	2 west side at 2,400 amps
Ac, 3 Ph, 60 Hz	460	4,000	1 east side at 4,000 amps
Ac, 3 Ph, 60 Hz	460	3,500	2 east side at 1,600 amps
Fresh water	6" mains, 1,600 gpm at 80 psi, twenty-one 2-1/2" outlets east side, fourteen 2-1/2" outlets west side		
Pure water	2" and 3" mains, 100 gpm at 80 psi, two 1-1/2" outlets west side, one 1-1/4" outlet east side		
Salt water	10" west, 10" and 20" east side mains, 12,000 gpm at 125 psi, nineteen 4" and seven 2-1/2 outlets each side. 2-1/2" headers with 2-1/2" outlets at dock floor		
Fire Protection	Same as salt water		
Compressed Air	6" mains, 10,000 cfm at 80 psi, fifty-six 1-1/4" outlets each side. 3" headers at dock floor with outlets		
Steam	6" & 12" mains, 80,000 phr at 150 psi, fourteen 2-1/2" outlets each side		
Oxygen	3" mains, 1,650 cfm at 100 psi, seven 1" outlets each side		
Sanitary sewer	10" east side main, gpm, sixteen 4" inlets each side		

Figure 29 Location of Drydock, San Diego Naval Station, San Diego, California

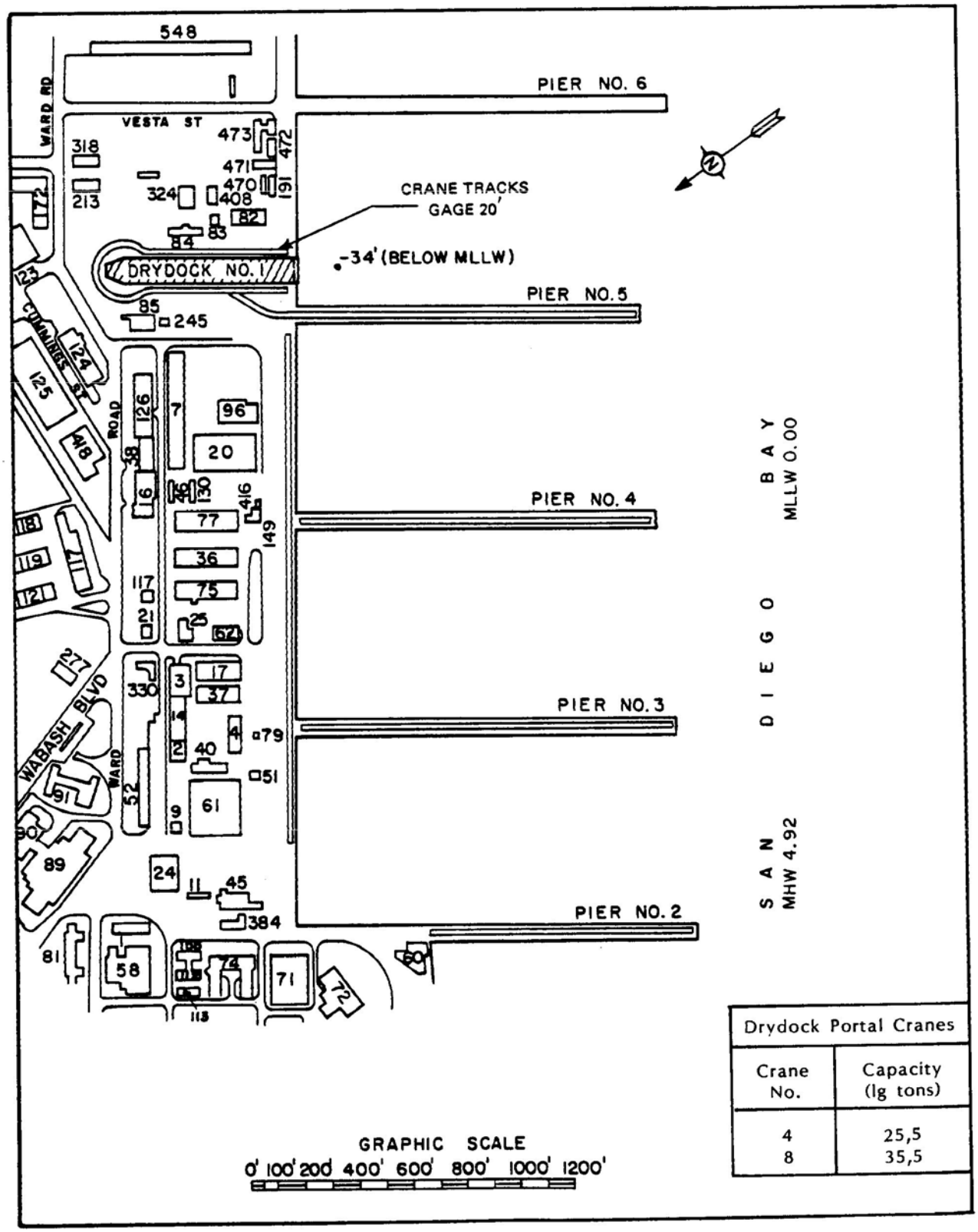


Figure 30 San Diego Naval Station Drydock No 1

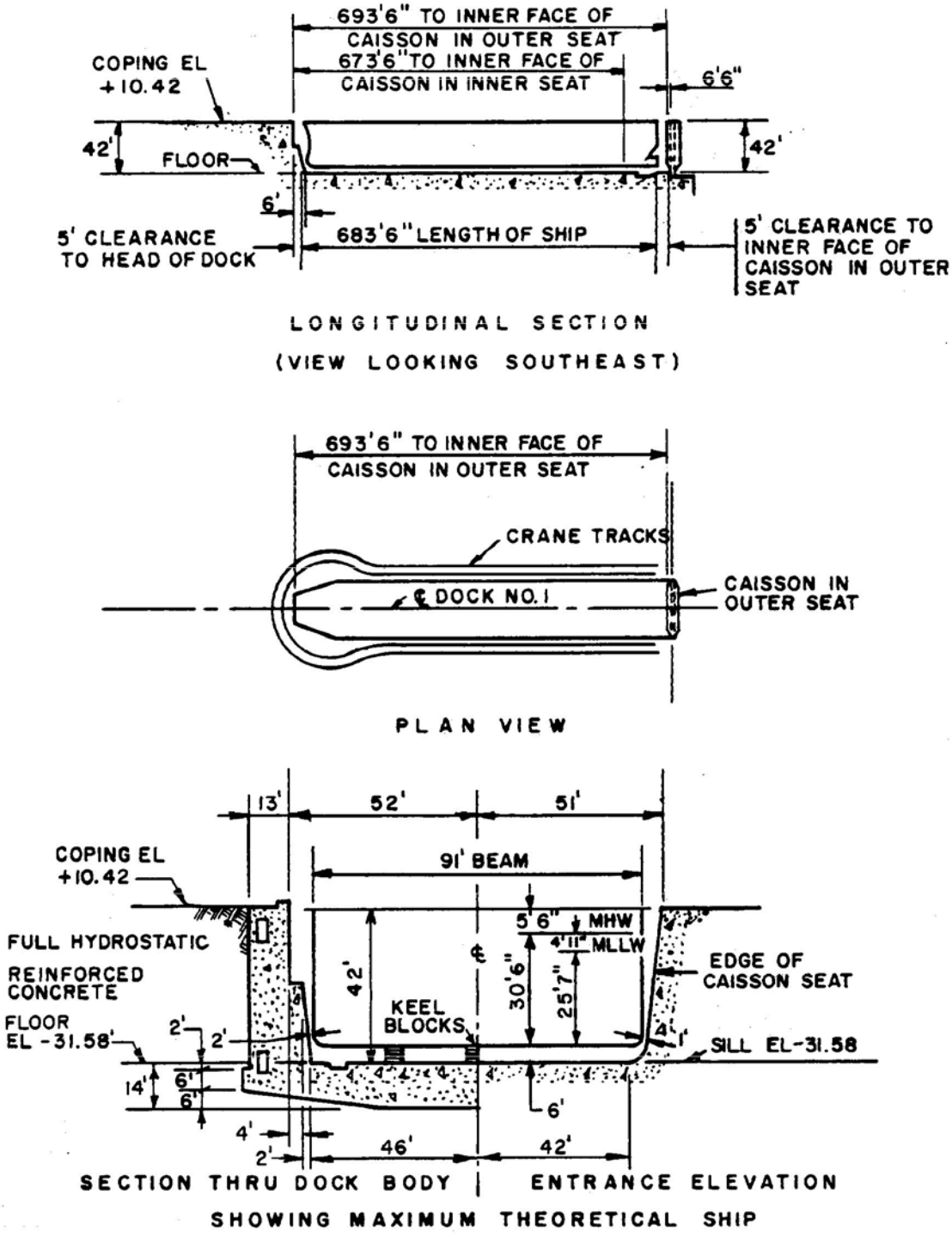


Table 25 San Diego Naval Station Drydock No. 1

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	AS	Earth	Concrete
Closure	Caisson, steel (rectangular box type).		
Dewatering Pumps	Two 54", 800 hp, 220,000 gpm. Time to dewater: 130 min		
Drainage Pumps	Two 14", 200 hp, 7,000 gpm		
Flooding	Through culverts. Time to flood: 60 min		
Captstans	7 total: 1 at head, 1 each side of entrance, 30 fpm at 36k; 2 each side, 30 fpm at 12k		
Portal Crane Maximum Capacities and Heights All crane requirements must be provided by theuser of the dock with mobile cranes			
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	480	3200	8 north side and 8 south side at 400 amps each
Ac, 1 Ph, 60 Hz	115/230	100	4 north side and 4 south side at 15 amp duplex each
Ac, 3 Ph, 60 Hz	120/208	200	2 each at east end
Ac, 3 Ph, 60 Hz	115/230	60	1 at south side
Fresh water	6” mains, 1,500 gpm at 80 psi, five 2-1/2" outlets each side		
Salt water	All saltwater requirements must be provided by the user of the Dock with portable pumps		
Fire Protection	Fire alarm pull boxes connected to the base fire alarm System/fire department, three each side. Also see saltwater		
Compressed Air	6" mains, 7,500 cfm at 100 psi, five 2-1/2" outlets each side		
Steam	6" mains, 30,000 phr at 130 psi, five 2-1/2" outlets each side		
Sanitary sewer	8" mains, 900 gpm, three 4" inlets each side		

APPENDIX A

CLOSED FACILITIES

A-1 **Closed Facilities**. The following is a list of drydock facilities listed in the MIL-HDBK-1029/3 that are now closed. If information (figures and/or tables) about these facilities is needed, please contact the NAVFAC Engineering Innovation and Criteria Office.

- Marine Railway, Annapolis Naval Station, Annapolis Maryland
- Military Ocean Terminal, Bayonne, New Jersey
- Drydocks, Charleston Naval Shipyard, Charleston, South Carolina
- Drydocks, Hunters Point Naval Shipyard, San Francisco, California
- Drydocks, Long Beach Naval Shipyard, Long Beach, California
- Drydocks, Mare Island Naval Shipyard, Vellejo, California
- Marine Lifts, Naval Air Station, Patuxent River, Maryland
- Drydocks and Marine Railways, Philadelphia Naval Shipyard, Philadelphia, Pennsylvania
- Drydock, Roosevelt Roads Naval Station, Vieques, Puerto Rico
- Drydock, Naval Drydock and Repair Facility, San Juan, Puerto Rico