



U.S. Department  
of Transportation  
**Maritime  
Administration**

# **Report on Survey of U.S. Shipbuilding and Repair Facilities**

---

**1985**

REPORT ON SURVEY OF U.S.  
SHIPBUILDING AND REPAIR FACILITIES

1985

Prepared By:  
Office of Shipbuilding Costs and Production  
Division of Production  
December 1985



CONTENTS

	<u>PAGE</u>
Introduction.....	1
General.....	2
Major Shipbuilding Facilities.....	3
ADDSCO Industries, Inc.....	5
Avondale Shipyards, Inc.....	6
Bath Iron Works Corporation.....	8
Bay Shipbuilding Corporation.....	10
Bethlehem Steel Corporation - Beaumont Yard.....	12
Bethlehem Steel Corporation - Sparrows Point Yard.....	13
Coastal Dry Dock and Repair Corporation.....	15
Fraser Shipyards, Inc.....	16
General Dynamics Corporation - Electric Boat Division.....	17
General Dynamics Corporation - Quincy Shipbuilding Division.....	17
Gunderson, Inc.....	19
Halter Marine, Inc. - Chickasaw Division.....	19
Ingalls Shipbuilding Division/Litton Systems, Inc.....	21
Lockheed Shipbuilding Company.....	22
Marathon LeTourneau Company - Gulf Marine Division.....	24
Marine Power and Equipment Co., Inc.....	25
National Steel and Shipbuilding Company.....	26
Newport News Shipbuilding and Drydock Company.....	28
Norfolk Shipbuilding and Drydock Corporation.....	30
Pennsylvania Shipbuilding Company .....	31
Portland Ship Repair Yard.....	33
Tacoma Boatbuilding Company.....	34

	<u>PAGE</u>
Tampa Shipyards, Inc.....	36
Todd Shipyards Corporation - Galveston Division.....	37
Todd Pacific Shipyards Corporation - Los Angeles Division.....	39
Todd Shipyards Corporation - San Francisco Division.....	40
Todd Pacific Shipyards Corporation - Seattle Division.....	42
Toledo Shipyard, The.....	44
Triple A Shipyards/Division of Triple A Machine Shop.....	44
Employment.....	45
Ship Repair Facilities.....	46
Repair (with Drydocking) Facilities.....	49
Major Topside Repair Facilities.....	50
Active Shipbuilding Base.....	50
Exhibit 1 - Shipbuilding Industry in the United States (Map).....	52
Exhibit 2 - ADDSCO Industries - Yard Plan.....	53
Exhibit 3 - Avondale Shipyards - Yard Plan.....	54
Exhibit 4 - Bath Iron Works Corporation - Yard Plan.....	55
Exhibit 5 - Bath Iron Works Corporation - Portland Yard Plan.....	56
Exhibit 6 - Bay Shipbuilding - Yard Plan.....	57
Exhibit 7 - Bethlehem, Beaumont - Yard Plan.....	58
Exhibit 8 - Bethlehem, Sparrows Point - Yard Plan.....	59
Exhibit 9 - Coastal Drydock - Yard Plan.....	60
Exhibit 10 - Fraser Shipyards - Yard Plan.....	61
Exhibit 11 - General Dynamics, Quincy - Yard Plan.....	62
Exhibit 12 - Gunderson, Inc. - Yard Plan.....	63
Exhibit 13 - Halter Marine, Inc. (Chickasaw, AL) - Yard Plan.....	64
Exhibit 14 - Ingalls/Litton (East Bank) - Yard Plan.....	65
Exhibit 15 - Ingalls/Litton (West Bank) - Yard Plan.....	66
Exhibit 16 - Lockheed (Plant 1) - Yard Plan.....	67

	<u>.AGE</u>
Exhibit 17 - Lockheed (Plant 2) - Yard Plan.....	68
Exhibit 18 - Marathon, Gulf Marine Division - Yard Plan.....	69
Exhibit 19 - Marine Power & Equipment - Yard 4 Plan.....	70
Exhibit 20 - National Steel and Shipbuilding - Yard Plan.....	71
Exhibit 21 - Newport News (South Yard) - Yard Plan.....	72
Exhibit 22 - Newport News (North Yard) - Yard Plan.....	73
Exhibit 23 - Norfolk Shipbuilding (Berkley Plant) - Yard Plan.....	74
Exhibit 24 - Pennsylvania Shipbuilding Company - Yard Plan.....	75
Exhibit 25 - Portland Ship Repair Yard - Yard Plan.....	76
Exhibit 26 - Tacoma Boatbuilding (Yards 1 and 2) - Yard Plan.....	77
Exhibit 27 - Tacoma Boatbuilding (Yards 3 and 4) - Yard Plan.....	78
Exhibit 28 - Tampa Shipyards - Yard Plan.....	79
Exhibit 29 - Todd, Galveston Division - Yard Plan.....	80
Exhibit 30 - Todd, Los Angeles Division - Yard Plan.....	81
Exhibit 31 - Todd, San Francisco Division - Yard Plan.....	82
Exhibit 32 - Todd, Seattle Division - Yard Plan.....	83
Exhibit 33 - Toledo Shipyard, The - Yard Plan.....	84
Exhibit 34 - Triple A, Hunters Point - Yard Plan.....	85
Exhibit 35 - Merchant Vessels Building or on Order (As of January 1)...	86
Exhibit 36 - Major U.S. Private Shipyards - Number of Shipways by Maximum Length Capability.....	87
Exhibit 37 - Active Shipbuilding Base (Map).....	88
Exhibit 38 - Shipbuilding Industry Workload Projection.....	89
Table 1 - Ship Construction Capability by Ship Type.....	90
Table 2 - Major U.S. Private Shipyards - Number of Shipbuilding Ways by Length.....	102
Appendix A - Standard Form 17 - Facilities Available for the Construction or Repair of Ships.....	105
Appendix B - Major U.S. Shipbuilding, Repair, and Topside Repair Facilities.....	114



## Introduction

In compliance with the Merchant Marine Act of 1936, as amended, 1/ the Maritime Administration (MARAD) conducts an annual survey to obtain information from the shipbuilding and ship repair industry to be used primarily to determine if an adequate mobilization base exists for national defense and for use in a national emergency. This report on the 1985 survey of U.S. shipyard facilities was prepared by the Division of Production, Office of Shipbuilding Costs and Production, and is for general use within the Maritime Administration and other Government agencies.

---

### 1/ Section 210

"It shall be the duty of the Secretary of Transportation to make a survey of the American merchant marine, as it now exists, to determine what additions and replacements are required to carry forward the national policy declared in Section 101 of the Act, and the Secretary of Transportation is directed to study, perfect, and adopt a long-range program for replacements and additions to the American merchant marine so that as soon as practicable the following objectives may be accomplished: ...Fourth, the creation and maintenance of efficient shipyards and repair capacity in the United States with adequate numbers of skilled personnel to provide an adequate mobilization base."

### Section 211

"The Secretary of Transportation is authorized and directed to investigate, determine, and keep current records of ...  
(g) The number, location, and efficiency of the shipyards existing on the date of enactment of this Act or thereafter built in the United States."

### Section 502(f)

"The Secretary of Transportation with the advice of and in coordination with the Secretary of the Navy, shall, at least once a year, as required for purposes of the Act, survey the existing privately owned shipyards capable of merchant ship construction, or review available data on such shipyards if deemed adequate, to determine whether their capabilities for merchant ship construction, including facilities and skilled personnel, provide an adequate mobilization base at strategic points for purposes of national defense and national emergency."



The statistical data accumulated by the survey is a major input into the Shipyard Evaluation Analysis System Model (SEAS), a quantitative assessment of the Nation's ship construction and ship repair capability. This capability is periodically compared with Department of Defense scenarios involving various contingency attrition rates and emergency civilian shipping requirements to assess the adequacy of the shipbuilding mobilization base, including ship repair and reactivation of the Maritime Administration reserve fleet and the U.S. Navy reserve fleet.

The survey also provides a data base that is used to evaluate the feasibility of proposed shipbuilding programs. Determinations are made as to which existing shipyards might construct proposed ships consistent with ship size and delivery date requirements. The need for construction of new facilities to meet the demands of proposed shipbuilding programs can be also identified. The data gathered by the annual survey also is used extensively in MARAD responses to queries received from a variety of interests, including members of Congress, the Secretary of Transportation, the Department of Defense, the Office of Management and Budget, and other Government agencies.

Each year in late spring, Standard Form 17, "Facilities Available for the Construction or Repair of Ships," is mailed to some 230 U.S. shipyards and ship repair facilities. The survey form was developed jointly by MARAD and the Navy. A completed Form 17 represents a detailed description of a shipbuilding or ship repair facility, which is not available from any other source on a continuing and structured basis. The information requested, and available for official use, can be reviewed on a blank Form 17 shown herein as Appendix A. A graving dock characteristics summary and floating drydock characteristics summary are appended to Standard Form 17 to better identify the characteristics of the facilities.

Upon receipt of a completed Form 17 from a shipyard, MARAD forwards a copy to the Office of the Coordinator for Ship Repair and Conversion which maintains records of available facilities and capacities of various shipyards and repair plants so that the Department of Transportation and the Department of Defense can use such facilities to the best advantage in the event of national emergency. The Federal Emergency Management Agency (FEMA) also uses information obtained by this survey, as does the U.S. Coast Guard and U.S. Army Corps of Engineers.

### General

The annual shipyard survey of 1985 has been completed; and the following information collected has been organized and condensed in the following narratives, exhibits, and tabulations to focus attention on those elements that are most often requested from this office. Appendix B is a statistical abstract of data gathered from those companies responding to MARAD's

annual survey. It lists the Nation's major shipbuilding, ship repair, and topside repair yards sorted on a coastal basis and displays information with respect to the size and type of each building position, drydock and berth space for vessels 400 feet in length and over, employment, and remarks regarding principal shipyard activities.

MARAD has examined drydock data submitted by shipyards in the 1985 survey. In preparing Appendix B, the following criteria were developed to establish the maximum ship size that could be accommodated in each drydock:

For floating drydocks, the maximum ship length is as given by the shipyards. The maximum beam was determined by allowing a two-foot (.6 m) clearance at each side between the ship and wing wall.

For graving docks, the maximum ship length was determined by allowing a two-foot (.6 m) clearance at each end between the ship and the inside of the dock at the floor. The maximum beam was determined by allowing a two-foot (.6 m) clearance on each side between the ship and each side of the dock entrance at the sill.

There are several types of floating drydocks and graving docks, and under certain circumstances additional clearance would be necessary between the ship and the dock body. Permissible ship sizes requiring additional clearance may be determined by simple calculation from the above criteria.

### Major Shipbuilding Facilities

A major shipbuilding facility is defined in this report as one that is open, having at least one shipbuilding position, either an inclined way, a launching platform, or a building basin, with the capability to accommodate a minimum ship size of 475 feet (145 m) length overall and a beam of 68 feet (21 m). There are presently 29 shipyards in this category, which are identified and geographically located in Exhibit 1.

Despite the continuing worldwide shipping recession, uncertain near-term future prospects, and declining commercial orderbooks, the U.S. shipbuilding and ship repair industry in FY 1985 invested over \$250 million in facilities modernization and expansion and as of July 1, 1985, planned to spend at least an additional \$100 million during the year ending June 30, 1986.

Since enactment of the Merchant Marine Act of 1970, the U.S. shipbuilding and ship repair industry has invested approximately \$3.7 billion in plant modernization and improvements. These investments have significantly increased the capacity, capability, and productivity of the industry. With the slump in commercial ship construction, the emphasis in recent years has been on expansion of ship repair, overhaul and conversion facilities. Exhibits 2 through 34 are general arrangement plans outlining shipbuilding and repair facilities in 28 of the major yards. Detailed descriptions of these exhibits are included in this report.

As of October 1, 1985, there were 11 deep-draft commercial vessels under construction or on order in U.S. shipyards. This orderbook was comprised of three containerships, two large crude oil carriers, two incinerator ships, one self-propelled dredge, and three product tankers (for a private shipping company for charter to the Military Sealift Command). Three of these 11 ships were being built with Federal ship financing guarantees (Title XI). Exhibit 35 illustrates the overall decline since the mid-1970's in both the numbers and gross tonnage of the merchant ship orderbook in the United States.

On October 1, 1985, there were 75 major combat and auxiliary ships under construction or on order for the Navy and nine medium-endurance cutters for the Coast Guard. In addition, the Navy's multibillion-dollar T-Ship program is providing much-needed near-term relief to U.S. shipbuilders, particularly to those yards which have traditionally relied on construction of new oceangoing merchant ships. (The prefix "T" designates civilian-manned Naval auxiliary ships under the control of the Military Sealift Command.) As of October 1, 1985, 13 commercial shipyards had been awarded contracts for construction of 29 new T-Ships and for major reconstruction of 23 existing merchant ships. Examples of types of vessels involved in the T-Ship program are: fast sealift ships, maritime prepositioning ships, auxiliary crane ships, hospital ships, fleet oilers, ocean surveillance ships, aviation logistics support ships, and surveying ships.

Table 1 has been prepared to answer the frequent question as to the number of shipbuilding positions available to build a complete specified ship. A single shipway or basin may have several building positions depending on the size of the ships being constructed. For example, the 1,200-foot by 192-foot (366 m by 59 m) basin at Bethlehem's Sparrows Point shipyard can accommodate one 265,000-dwt. tanker or four of the smaller 475 foot by 68-foot (145 m by 21 m) cargo ships. With the exception of the mobilization ship, the ship types listed in Table 1 are mainly those historically delivered to commercial service. The total number of building positions varies from 138 for the small cargo ship to three for a huge 265,000-dwt. tanker. Length overall and beam are given for all ships and, in addition, deadweight tonnage is indicated for the bulk carriers. An important consideration that is not addressed in Table 1 is the common shipbuilding practice of laying a keel on a building position already occupied by another ship. For example, in a 700-foot (213 m) basin, a complete 610-foot (186 m) containership and the stern section of a second ship could be constructed simulta-neously. This production procedure, analyzed periodically by SEAS, maximizes the use of shipbuilding facilities, minimizes the construction period, and increases the number of ships that can be produced in a given period of time. Table 1 addresses only the number of complete ships that can be constructed simultaneously in each building position(s).

Table 2 is a somewhat different presentation of the data, meaningful to those requesting information from the annual survey. In lieu of actual ships, maximum ship length is used to determine the number of shipways or basins available. In this tabulation, the emphasis is on the number of individual facilities available and not on the number of ships that can be constructed. Again, using Sparrows Point as an example, Table 2 lists the 1,200-foot by 192-foot (366 m by 59 m) basin as one facility regardless of what type of ship is constructed in it. Table 1 indicates that there are six building positions for a ship 475 feet (145 m) LOA at Sparrows Point, whereas Table 2 indicates that the yard has three individual shipways capable constructing a ship 475 feet (145 m) in length. Exhibit 36 is a histogram displaying the reduction in the number of available shipways as the maximum ship length increases.

Following is a brief description of 29 major U.S. commercial shipbuilding facilities capable of constructing oceangoing or Great Lakes merchant ships, with a minimum size of 475 feet by 68 feet (145 m by 21 m).

1. ADDSCO Industries, Incorporated

ADDSCO Industries, Inc., is the parent or holding company of a group of marine-related companies which were reorganized under the new name in 1984. Alabama Dry Dock and Shipbuilding Corporation, is the repair and conversion subsidiary while Alabama Maritime Corporation is the new construction facility. Prior to 1984, the shipyard was referred to as Alabama Dry Dock and Shipbuilding Company.

Both the repair and new construction facilities are located on the Tenn-Tom Waterway, across the River from Mobile, Alabama, about 30 miles from the Gulf of Mexico.

Since 1916 the yard has constructed a variety of ships (both commercial and Naval), barges and drill rigs. In recent years, the company has continued its facility improvements, mainly the upgrading and modernization of existing drydocks, piers, shops, and equipment.

In 1985, Alabama Drydock and Shipbuilding Corporation was awarded several Navy conversion, overhaul, and reactivation contracts as well as a number of commercial drydocking and repair jobs. Alabama Maritime completed the deckhouse steel work for five 30,000 dwt. T-5 tankers in 1985 and delivered them to Tampa Shipyards. Alabama Maritime Corporation is currently engaged in several fabrication contracts utilizing their new numerically controlled steel fabrication shop.

ADDSCO Industries, Inc. and its subsidiaries operate four side-launching shipways, each of which can accommodate a maximum ship size of 523 feet by 90 feet (160 m by 27 m) and one end-launch shipway which can handle vessels as large as 620 feet by

105 feet (189 m by 32 m). There are two floating drydocks available for repair and conversion; the larger of the two can accommodate a ship size of 750 feet by 100 feet (229 m by 31 m). There is also 9,370 feet (2856 m) of berthing space at seven finger piers for topside repairs. ADDSCO Industries and its subsidiaries have 19 revolving gantry cranes with capacities up to 75 tons (67 metric tons) to service the shipways and berthing areas. A 275-ton (250 metric ton) Goliath bridge crane which straddles the slip between piers K and L is utilized for construction and outfitting.

Mobile Giant Erectors, Inc., also a nearby subsidiary of ADDSCO Industries, operates the largest capacity lifting facility on the Gulf Coast. This twin-boom luffing derrick with 300-foot (91 m) high booms and the capability of handling 1400 metric tons at a radius of 175 feet (53 m) gives ADDSCO Industries the ability to serve the heavy construction industry and to construct the heavy offshore structures required in today's market.

At mid-1985, combined employment totaled 650 at the ADDSCO subsidiaries that handle ship construction and ship repair-- Alabama Dry Dock and Shipbuilding Corporation (repair work) and Alabama Maritime Corporation (new construction).

Exhibit 2 is a current general arrangement plan of these two ADDSCO facilities.

## 2. Avondale Shipyards, Incorporated

Avondale Shipyards is located on the west bank of the Mississippi River approximately nine miles upriver from New Orleans, LA. Avondale, previously a wholly-owned subsidiary of Odgen Corporation, was recently sold to its employees in an Employee Stock Ownership Plan (ESOP). Since it began operations in 1938, Avondale has developed into one of the largest and most diversified shipyards in the country. The yard has constructed dry cargo ships, large crude carriers, complex chemical parcel tankers, large high-speed containerships, Navy ships, Coast Guard cutters, offshore drilling rigs and drill ships; and it has the distinction of being the only American shipyard to have constructed LASH vessels. A total of 22 were built with the aid of construction-differential subsidy.

Avondale also maintains an active repair operation for commercial and Naval ships. Inland waterway and offshore oil vessels are repaired by Avondale's Westwego and Harvey Divisions. Offshore platforms, jackets, and production modules are constructed for the oil industry by Avondale's Offshore Division in Morgan City, LA.

In 1982, the Navy awarded contracts to Avondale for the major conversion of three former Sea-Land SL-7 class containerships to T-AKR fast sealift ships for the DOD Rapid Deployment Force. Avondale has completed the reconstruction of the first two of these ships, the ANTARES (T-AKR 294), and the ALTAIR (T-AKR 291), which were redelivered to the Navy in July 1984 and November 1985. The third ship, the POLLUX (T-AKR 290), is scheduled for redelivery March 1986.

During the past year, Avondale also completed construction and delivered the forebodies for five 30,000-dwt. T-5 product tankers for Tampa Shipyards.

Avondale's new construction orderbook as of October 1, 1985, consisted of five fleet oilers (T-AO's) with options for up to four additional T-AO's, and three dock landing ships (LSD's) with options to build two additional LSD's. The company is also currently building large gas turbine driven compressor modules and the Vidalia Hydroelectric Plant.

Avondale's main yard facility totals 222 acres and contains three outfitting docks equipped with supporting shops and over 6,000 feet (1829 m) of pier space, an upper shipbuilding area that is capable of constructing ships up to 300,000 dwt. or three Panamax sized ships concurrently, and a lower shipbuilding area that is capable of building five LASH ships concurrently. Avondale's unique transfer method, modern construction techniques, and steel processing facilities have made it one of this country's most productive shipyards.

Avondale's upper yard shipbuilding area has two large positions to accommodate vessels of up to 1,020 feet (311 m) in length by 174 feet (53 m) beam. The major part of one ship can be erected along with the stern section of a second ship on position No. 1 while a third hull is being completed on position No. 2. Ships constructed in the upper yard move laterally in three positions for launching by Avondale's large floating drydock which can accommodate ships as large as 1,000 feet by 216 feet (305 m by 66 m), with a lifting capacity of 81,000 long tons (82296 metric tons).

Avondale's lower yard has a side-launching construction area that has three large positions to accommodate ships as large as 1,200 feet by 126 feet (366 m by 38 m) with a light weight of approximately 16,000 long tons (16026 metric tons). Ships built in the lower yard move laterally toward the river and parallel to the river in five positions. Up to five large vessels, greater than 700 feet (213 m) LOA, can be under construction simultaneously in this lower yard area. A Panamax floating drydock, which was placed in service in 1982, is moored in this area for the repair of ships and to support the docking requirements of new construction. This drydock can accommodate ships up to 750 feet by 114 feet (228 m by 35 m) and has a lifting capacity of 20,000 long tons (20320 metric tons).

Avondale's lifting capability includes: a 600-ton (545 metric ton) floating crane which was recently supplemented by a 250-ton (227 metric ton) turnover rig; a 225-ton (204 metric ton) and three 160-ton (145 metric ton) whirley cranes in the upper yard; and two 150-ton (136 metric ton) plus one 125-ton (113 metric ton) whirley cranes in the lower yard. In addition, Avondale has 29 cranes with 50-ton (45 metric ton) or greater capacity.

Avondale's steel fabricating facilities have the capability to fabricate up to 175,000 tons (177,923 metric tons) of steel per year. There are four primary shops: the Plate Shop, Tee-Beam Shop, Blacksmith Shop, and Sheetmetal Shop, which are enclosed within steel and concrete buildings totaling 273,150 square feet (25375 m2). Principal fabricating facilities include a panel line, tee beam welder, stress relieving and normalizing furnaces, and pickling vats in the structural area. The fabrication of structural units is supported by two paint and blast buildings.

Avondale's nearby Westwego, LA, facility is capable of building vessels 450 feet (137 m) long by 90 feet (27 m) beam. A floating drydock with a lifting capacity of 3,800 long tons (3861 metric tons) is available at Westwego for repair of small ships, river boats, and barges.

Avondale has invested heavily in facility improvements since 1970. Recent significant improvements include, among others, a new enlarged machinery and piping module assembly building, a non-ferrous pipe fabrication shop to supplement the semi-automated pipe shop that was added a few years ago with MARAD support, new plasma arc burning equipment, and a new fabricated beam shop.

Avondale has similarly continued its technology transfer and investment program and completed its direct technology transfer program with Ishikawajima-Harima Heavy Industries Co., Ltd. (IHI) of Japan. The program is fully implemented in the current construction of the T-AO 187 class ships.

In July 1985, the total labor force was 4,600, up from about 4,342 a year earlier. Employment is expected to increase in late 1985 as construction begins on the recently ordered LSD's.

Exhibit 3 is a current arrangement plan of Avondale's main plant.

### 3. Bath Iron Works Corporation

Bath Iron Works Corporation, a subsidiary of Congoleum Corporation, is located on the Kennebec River in Bath, Maine. The small iron foundry which was established on this site in 1826 became Bath Iron Works, Ltd., in 1884, and the first shipbuilding began in 1889. This yard has a history of proven diversity, having constructed various type of ships including roll-on/roll-off cargo vessels, containerships, tankers, dredges, barges, fishing vessels, destroyers, and guided missile frigates. Bath has built a total of 168 destroyers for the Navy.

The last commercial ships built at the yard were two 34,000-dwt. product tankers, the FALCON LEADER, delivered in August 1983, and the FALCON CHAMPION, delivered in January 1984.

Bath Iron Works is one of the industry leaders in design, construction, and modernization of destroyer-type vessels for the U.S. Navy. BIW was the lead shipbuilder for the Navy's guided missile frigate (FFG-7 class) program. The lead ship, the OLIVER HAZARD PERRY, was completed in 1977; and the Navy has awarded the company follow-on contracts for the construction of 23 additional FFG-7 class frigates, the last of which is scheduled for delivery in 1986. As of October 1, 1985, there were two of these ships in various stages of construction.

The Navy in 1982, selected Bath Iron Works as its second source for the high-technology CG 47 class Aegis cruiser program, awarding the company contracts to build two of these Ticonderoga class cruisers (CG-51 and CG-58). In 1984 two additional CG 47 class cruisers were ordered, the last of which is scheduled for delivery in 1989. The lead shipyard in the program is the Ingalls Shipbuilding Division of Litton Industries which currently has eight of these ships on order or in production.

In 1985, BIW was selected as the lead shipbuilder for the design and construction of the Navy's Arleigh Burke class guided missile destroyer (DDG-51) program. Actual construction of the lead ship is scheduled to begin in 1987 with delivery in 1989.

In the early 1970's, BIW instituted modular construction and preoutfitting processes.

In 1974, Bath completed a major expansion and modernization program. The upgrading of facilities included the reconstruction of two shipways to accommodate ships of 700 feet (213 m) in length with a maximum beam of 130 feet (40 m), or two ships per way with a beam of 54 feet (16 m) each; the installation of a 220-ton (200 metric ton) level-luffing crane with sufficient outreach to erect units on both shipways; and new steel fabrication shops and equipment that have increased steel throughput capacity by 50 percent. To accommodate its accelerated naval shipbuilding program, BIW in 1979 began an additional facilities improvement program which continued into 1981. Included in the earlier stage of this program were expansion of the main assembly building to double the interior work area, installation of additional computer-aided lofting and burning equipment, and expanded machine shop and pipe shop capability.

More recent improvements were an additional blast and paint facility and two 300-foot by 60-foot (91 m by 18 m) platens with movable covers.



Complementing its shipbuilding activities, BIW has a fully staffed Overhaul Division and Industrial Products Division.

In addition to the two upgraded building positions, Bath operates one other shipway that can accommodate a ship 650 feet (198 m) in length with a beam of 88 feet (27 m). For drydock work at its main yard, there is an 8,400-ton (8534 metric ton) floating drydock that can handle ships up to 550 feet by 88 feet (168 m by 27 m). Two wharves and a pier provide a total of 2,200 linear feet (671 m) for outfitting and repair work.

BIW operates a supporting facility, the 33-acre Hardings fabrication plant, located three miles (4.8 km) from the shipyard at East Brunswick, where the initial steel fabrication takes place. At this plant, steel is blasted and coated, cut, straightened, or shaped. The steel is then transported to Bath by truck or rail where it is joined together into subassemblies for final erection at the shipway. The Hardings plant has been highly mechanized and computerized, and much of the work is automated.

In a joint industrial development with the State of Maine and the City of Portland, BIW built a new ship overhaul and repair yard in Portland Harbor. The new facility became operational in late 1983. Its centerpiece is a large floating drydock with a lifting capacity of 81,000 long tons (82296 metric tons), greatly expanding the company's capabilities in the overhaul and repair field.

As of mid-1985, the company's administrative and production work force totaled 6,795, compared to 6,800 a year earlier.

Exhibit 4 is a current plot plan of the Bath Iron Works main yard facilities, and Exhibit 5 is a general arrangement drawing of BIW's repair and overhaul yard in Portland, Maine.

#### 4. Bay Shipbuilding Corporation

Bay Shipbuilding Corporation, in Sturgeon Bay, Wisconsin, is the largest shipbuilder on the Great Lakes. Its parent company, The Manitowoc Company, Inc., purchased Sturgeon Bay Shipbuilding and Dry Dock Company in 1968 and the adjoining Christy Corporation property in 1970. These two facilities were combined to form the Bay Shipbuilding Corporation. The present 80-acre site has channel access from both Lake Michigan and Green Bay and provides ample dock space for Great Lakes vessel repair and new construction.

Bay Shipbuilding, a full-service shipyard, has built more modern self-unloading drybulk ships than any other yard in the United States. From 1973 through 1981, 15 self-unloading Great Lakes ore carriers were delivered, including six 1000-foot-long (305 m) vessels.

With declining orders for construction of Great Lakes ore carriers, Bay Shipbuilding in 1980 entered salt water shipbuilding competition by delivering a 396-foot-long (121 m) tank barge and a 407-foot-long (124 m) tank barge. In 1981, two 550-foot-long (168 m) oceangoing deep-notch barges were completed; and in August 1982, a 610-foot-long (186 m) oceangoing deep-notch barge was delivered. With the delivery in September 1982 of a tug/barge to Amoco Oil Company for service on the Lakes, no new construction work remained in the yard. Overhaul of the Coast Guard cutter, MACKINAW, and tank top renewal of the ore carrier, WILLIAM CLAY FORD, provided work until April 1983. Bay Shipbuilding in March 1983 was awarded a contract for conversion of the former general cargo/containership, PRESIDENT HARRISON, to an auxiliary crane ship (T-ACS 1) for the Navy. This project was completed on May 1984. In August 1983, the company was awarded a contract from Lambert Point Barge Co., Inc. to build a 550-foot (168 m) long oceangoing coal topping-off barge. This 35,000-dwt. self-loading and self-unloading barge was delivered in late June 1984.

On October 22, 1984, Sea-Land Corporation signed a contract to have three 1,400-TEU containerships constructed at Bay Shipbuilding. This contract will provide some 1,500 additional jobs at the yard. The keel was laid for the first ship in August 1985 and the last of the three ships is scheduled for delivery in May 1987.

The company in 1977 completed a major facilities expansion program that has enabled the shipyard to build 1000-foot (305 m) Great Lakes bulk carriers. The new graving dock can accommodate a vessel as large as 1,100 feet by 136 feet (335 m by 41 m) and is the largest such dock in the Lakes. It is serviced by a 200-ton (182 metric ton) traveling gantry crane and several crawler cranes. More recently the following facilities were added to the yard's modern plant: an additional 2,400 linear feet (732 m) of new dock wall; an extensive expansion of the fabrication shop with 200-ton (182 metric ton) bridge crane lifting capacity; new pipe shop, carpenter shop, and stores distribution center; shot blast and prime surface treatment line; one-side panel welder; computer lofting; and in-house design capabilities. Steel fabrication capacity for ship construction is estimated to be 36,000 tons (32681 metric tons) per year.

Bay operates a side-launching way that can accommodate a maximum ship size of 730 feet by 105 feet (223 m by 32 m), and one floating drydock having a lift capacity of 7,000 tons (7112 metric tons) is available which can handle ships up to 640 feet by 66 feet (195 m by 20 m). There are 7,090 feet (2161 m) of berthing space for repair and outfitting. The 14 available piers are serviced by crawler cranes of up to 80 tons (73 metric tons) capacity each.

At mid-1985, total employment was 589, up from 243 a year earlier.

Exhibit 6 is a current general arrangement plan showing Bay Shipbuilding's facilities.

5. Bethlehem Steel Corporation - Beaumont Yard

This shipyard, located on the Neches River in Beaumont, Texas, was established in 1917 by Beaumont Shipbuilding and Drydock Company, which built C1-A cargo ships and Navy minesweepers during World War II. Bethlehem acquired the yard in 1947 and has pioneered in the design and production of mobile offshore drilling rigs and offshore oil and gas facilities. The Beaumont plant has been one of Bethlehem's most successful operations and has been a world leader in production of offshore drilling rigs and drillships. It is also an experienced builder of barges, primarily of the sophisticated tank type required by Gulf Coast industries for the transportation of liquid and bulk chemicals.

Beaumont is also experienced in fabrication of non-ship industrial products such as process and pressure vessels, oil and LPG storage tanks and spheres, rotary cement kilns, and blast furnace structures. Its bending-roll capacity and stress-relieving furnace are among the largest in the South.

Bethlehem-Beaumont has delivered more than 50 jackup drilling units since building its first jackup rig in 1954 and has also designed and built both semisubmersibles and drillships. The yard's last drilling rig was delivered in November 1982. Since then, shipyard work for the depressed offshore oil industry has declined.

In November 1982 and January 1983, the Navy awarded Bethlehem Steel Corporation contracts to reconstruct five Maersk Line RO/RO ships to maritime prepositioning ships, as part of the Navy's program to support the Rapid Deployment Force. Two of these five ships were converted at the company's Beaumont yard, with some of the work subcontracted to Todd-Galveston. Each vessel was lengthened 157 feet (48.8 m), and the depth was increased from 54 feet (16.4 m) to 70 feet (21.3 m). Upon completion, the ships will be time chartered to the Military Sealift Command. Work on the first ship, the ELEO MAERSK (renamed the PFC. WILLIAM B. BAUGH) began in January 1983; and the reconstructed vessel was redelivered in October 1984. Work on the second ship, the EMILIE MAERSK (renamed the 1st LT. ALEXANDER BONNYMAN, JR.) started in August 1983; and the reconstructed vessel was redelivered in September 1985. With completion of this project, the yard's backlog was depleted, and the yard is currently seeking new projects.

The Beaumont Yard is highly mechanized. In the early 1970's the company installed a multimillion-dollar panel line and new material handling facilities. During the past seven years, other capital improvements included: installation of CNC plasma burning machine, larger plate bending rolls, larger overhead bridge cranes, pipe burning and bending equipment, an additional pipe fabricating shop, better and more automatic welding equipment, an updated electrical distribution system, mobile cranes, better building platens, automated air compressors, and a computer graphics design terminal. The program of facility improvement is continuing with the installation of CNC machine tools, automated panel line operations, and CAD/CAM systems among the projects.

Bethlehem-Beaumont has one side-launching way that can accommodate ships up to approximately 800 feet by 96 feet (224 m by 29 m) and also operates a smaller side-launching way which is available for barge or module construction and repair work.

There are 4,000 feet (1219 m) of fully-serviced piers and wharves and mobile equipment for servicing ships or other vessels at pierside or anchorage. With a 500-ton (508 metric ton) lift capacity, the company's barge-mounted "Big Bessie" is the largest floating derrick between Houston and New Orleans.

In mid-1985, Beaumont opened its Sabine Yard in Port Arthur, Texas, for offshore drill rig repair utilizing a 64,000 long ton (65,069 metric ton) lifting capacity floating drydock, one of the country's largest. This eight-section Navy surplus drydock is leased from the Port of Port Arthur and can accommodate vessels up to 1,100 feet in length.

Employment at Bethlehem-Beaumont totaled 900 at mid-1985, down from about 1,690 at mid-1984. However, extensive layoffs are expected.

Exhibit 7 is a current layout of the Beaumont plant and facilities.

#### 6. Bethlehem Steel Corporation - Sparrows Point Yard

The Sparrows Point shipyard is located on the Patapsco River in the Baltimore, MD, metropolitan area. Established in 1891, the yard became part of the Bethlehem organization in 1916 and served as a major shipbuilder during two world wars. During World War II, Sparrows Point constructed 101 vessels of 16 different classes. During the 1950's and 1960's, it was among the most active yards in the Nation, specializing in series construction of standard sizes of Bethlehem-design tankers, as well as freighters and containerships. Sparrows Point is primarily a shipbuilding yard, and in its building basin, the second largest in the United States, it is capable of constructing ships of sizes up to about 300,000 dwt. The yard is also capable of accomplishing repair and conversion work with the building basin serving as a drydock facility.

In November 1977, this shipyard completed the last of a series of five 1,100-foot (335 m) crude carriers (MA Design T10-S-101b), among the largest tankers ever built in the United States. In 1979 and 1980 two containerships (MA Design C8-S-85d) were completed and delivered to Farrell Lines. Since 1979, Sparrows Point has built six Bethlehem-design offshore drilling rigs and six 47,000-dwt. oceangoing tug/barge tankers (Construction of the tug portion was subcontracted to Halter Marine).

In 1985, the yard completed the major conversion of three Maersk Line RO/RO ships to maritime prepositioning ships, as part of the Navy's MPS program to support the Rapid Deployment Force. Each vessel was lengthened 15' feet (48.8 m), and the depth was increased from 54 feet (16.4 m) to 70 feet (21.3 m). The first of the ships, renamed the CPL. LOUIS J. HAUGE, JR., was

redelivered in September 1984; the second ship, the PFC. JAMES ANDERSON, JR., was redelivered in March 1985; and the third vessel, the PVT. HARRY FISHER, was redelivered in September 1985.

As of October 1, 1985, the yard was in the process of reflagging five Barber Steamship Lines RO/RO vessels for the Ready Reserve Fleet. All five were scheduled for completion in 1985. Other work in the yard involves the repair of a collier, construction of a feeder barge, and overhaul of a Navy vessel.

In June 1985, the yard was awarded a contract by the Navy for the design and construction of two oceanographic survey ships (T-AGS), the last of which will be delivered in March 1988.

With its range of skills, tools, and facilities, this yard has been called upon regularly by various industries to produce large-scale steel fabrications, weldments, and a variety of specialized assemblies.

To provide the capability for construction of supertankers at Sparrows Point, millions of dollars were invested in facilities improvements; such as, establishing new production and materials handling methods, installing new and sophisticated systems and equipment, and developing new design concepts and engineering techniques. The major components of this program, completed in 1974, were the building basin for construction of ships as large as 1,200 feet by 192 feet (366 m by 59 m) and a new panel shop for fabrication of steel. This fabrication shop is capable of constructing panels weighing up to 200 tons (182 metric tons). Other improvements included the structural strengthening of Pier No. 1, a numerically controlled gas plate cutting machine, automated plate and shape blasting-coating equipment, and expanded machine shop and pipe shop. During the third quarter of 1985, the yard completed the dredging of berth areas, approach channels and in-yard channels.

Since the yard's forecast for ship construction and servicing indicates that demand will center around smaller-sized vessels, it is installing a two-position intermediate gate to increase the flexibility of its 1,200-foot (366 m) building basin by dividing it into two sections. In one position the basin's sections will be 300 feet and 900 feet (91 m and 274 m) in length. In the second position, the sections will be 685 feet and 515 feet (209 m and 157 m) in length.

Complementing the large construction basin, which is served by four 100-ton (91 metric ton) tower cranes, Sparrows Point maintains two building ways. One way can accommodate a maximum ship size of 800 feet by 106 feet (244 m by 32 m), and the other a maximum ship size of 800 feet by 95 feet (244 m by 29 m). Two smaller sliding ways are being used as platen areas and would require extensive refurbishing to reactivate. The yard does not have drydocking facilities except for the building basin. Four outfitting berths are available with a combined length of 3,970 linear feet (1210 m) of space serviced by four tower cranes with lifting capacities up to 50 tons (45 metric tons). Several locomotive cranes of various capacities are also available.

The total labor force at Sparrows Point was 1,185 at mid-1985, down from 2,240 a year earlier.

Exhibit 8 is a current plot plan outlining the company's construction facilities.

#### 7. Coastal Dry Dock and Repair Corporation

Coastal Dry Dock was incorporated in New York in 1950 and for a number of years maintained ship repair facilities on Staten Island. In 1971, the company disposed of its Staten Island plant, taking over two drydocks along with ancillary facilities in the former Brooklyn Navy Yard (later the New York Naval Shipyard). In 1980, under an agreement with Seatrain Lines, Inc., the company also took over drydocks, shops, and other adjacent facilities previously operated by Seatrain Shipbuilding Corporation, which ceased operations in 1979. Coastal Dry Dock is presently leasing from the City of New York the entire former Brooklyn Navy Yard waterfront, shipbuilding and repair facilities, and shoreside housing quarters for 2,400 naval personnel.

Although Coastal's current activities mainly involve the repair, overhaul, and conversion of U.S. Navy vessels, the yard has the capacity for major shipbuilding in the event of national emergency. When this shipyard was the Brooklyn Navy Yard, several battleships, aircraft carriers, and other naval combatants were among the large number of vessels built.

As of October 1, 1985, repair and overhaul work in the yard for the Navy consisted of a DD-963 class destroyer, an ammunition ship, and an amphibious transport dock.

Among the facilities Coastal Dry Dock has now at its disposal are six graving docks ranging from 349 feet (106 m) to 1,092 feet (333 m) in length, and 12 deep-water berths up to 1,200 feet (366 m) in length.

The two largest graving docks are serviced by two 200-ton (182 metric ton) gantry cranes and two 85-ton (77 metric ton) gantries. Cranes servicing the other four drydocks range from 35 to 50 tons (32 to 45 metric tons). By operating the two 200-ton gantries in tandem, Coastal has the capability of lifting a maximum weight of about 400 tons (364 metric tons).

The company's multimillion-dollar facilities improvement and upgrading program, which was completed in early 1983, includes reactivation and modernization of the yard's six graving docks. Each of these drydocks has been certified by the Navy.

Coastal's work force in mid-1985 totaled 825, lower than 1,150 a year earlier.

Exhibit 9 is a current general arrangement plan of the company's drydocks, piers, and shops.

## 8. Fraser Shipyards, Incorporated

The Fraser Yard, the only major American shipyard and drydock operation on the Western end of the Great Lakes, is located on Howards Bay in Superior, WI. Since it was founded in the 1890's by Capt. Alexander McDougall, who built 42 of his famous "whaleback" steamers and barges there, this plant has had a succession of owners. From 1900 to 1926, Superior Shipbuilding Company operated the yard and built more than 50 large Great Lakes ore carriers. The yard became a repair facility of the American Ship Building Company from 1926 to 1945 and then became known as Knudsen Brothers Shipbuilding and Dry Dock Company.

Fraser-Nelson Shipbuilding and Dry Dock Company took over the plant in 1955, and the present name was adopted in 1964. In August 1977, the yard was sold to Reuben Johnson & Son, Incorporated, a Superior, WI, contracting and construction firm, but business continues under the Fraser name.

Since World War II, this complete shipbuilding and ship repair facility has specialized in vessel repair and ship modernization including lengthenings, repowering and engine room automation, and self-unloader conversions. In the past 15 years, Fraser has performed most of the major ship lengthening work on the Great Lakes. At this shipyard, general ship repair also has been an important source of revenue.

In 1981, Fraser completed the \$14.2 million conversion of the CHARLES M. BEEGHLY from a straight-deck bulk carrier to a self-unloading bulker for Interlake Steamship Company. In May 1982, Fraser Shipyards completed conversion of three ships of U.S. Steel Corporation's Great Lakes fleet -- the ARTHUR M. ANDERSON, CASON J. CALLAWAY, and PHILIP R. CLARKE -- to conveyor-type self-unloaders. Following completion of these vessels, there was no major repair or conversion work, until the conversion to diesel power of the GEORGE A. SLOAN which was completed in June 1985. In July 1985, with only minor repair work in the yard, employment including salaried personnel totaled only 35 people.

Also in 1981, the Fraser yard instituted a major renovation of its fabrication capabilities including a 40 percent increase in its platen table capacity and extension of its railroad trackage to increase steel unloading capabilities by 300 percent. An all-new steel cutting process with hydraulic loading and unloading tables was installed, as well as major repowering of the shipyard to support the expanding facilities and to improve existing capacity. New automated welding equipment and related modern techniques also were instituted to increase productivity.

Fraser maintains two graving docks suitable for ship construction, repair, and conversion work. One basin can accommodate a vessel 825 feet by 82 feet (251 m by 25 m), and the other a vessel 620 feet by 61 feet (189 m by 19 m). A small graving-type dock was added in 1973 to build new midbody sections for the bulk ore freighters under contract for lengthening at that time. There are 4,450 feet (1356 m) of pierside berthing.

Fraser's 10 mobile cranes, ranging from 15 tons (14 metric tons) to 150 tons (136 metric tons) can service any building dock, as well as outfitting and repair berths and also can be floated on a crane lighter for work afloat. The company also operates an "outside" repair fleet totaling 12 units -- tugs, work launches, and barges -- capable of performing repairs on vessels while they are loading or unloading cargoes in Duluth-Superior harbor and adjacent ports.

Exhibit 10 is a current plot plan of Fraser's shipbuilding and ship repair facilities.

9. General Dynamics Corporation - Electric Boat Division

This shipyard, located in Groton, CT, is privately owned, but engaged exclusively in construction of submarines for the U.S. Navy.

10. General Dynamics Corporation - Quincy Shipbuilding Division

One of the Nation's largest and most modern shipbuilding facilities, the Quincy Shipbuilding Division of General Dynamics Corporation, is located on the Fore River in Quincy, MA, approximately 10 miles southeast of Boston. Since its founding in 1884 as the Fore River Engine Company, this shipyard has designed and built more than 600 vessels of all sizes and types, including 285 ships for the Navy and 215 commercial ships. The yard was purchased from Bethlehem Steel Corporation in 1963.

Quincy Shipbuilding is the world's foremost designer and builder of LNG tankers, delivering 10 of these 935-foot (285 m) high-technology carriers during the late 1970's. The shipyard's present facilities reflect the substantial investments made in new technology to achieve efficient series production of these ships.

Other commercial construction has included three innovative barge-carrying ships built for Lykes Brothers and several large oceangoing deep-notch petroleum barges.

In recent years, the yard delivered to the Navy two ammunition ships, six replenishment oilers, two submarine tenders, and four dock landing ships. Quincy Shipbuilding also carries out a substantial volume of overhaul and repair work for the Navy. In April 1983, the company completed the RO/RO containership, CHARLES CARROLL, (built for Sun Ship for delivery to Waterman Steamship Corporation).

Additionally, Quincy has designed a new class of coal-fired, self-unloading colliers for the coastwise transport of coal. The first of these 32,300-dwt. ships, the ENERGY INDEPENDENCE, was delivered in August 1983. This is the first coal-burning collier to be built in the United States since the late 1920's.



In 1975, Quincy Shipbuilding completed a major expansion and renovation of its 180-acre facility. Among the major improvements were:

- o Conversion of two conventional sliding ways to large construction basins;
- o A new steel fabrication process line with updated equipment including a doubled-bed flat bar stripper, a web cutter with 19 torches in tandem, a T-beam fabricator, two plate stiffeners, a one-sided butt welding gantry, and two 40-ton (36 metric ton) cranes;
- o A 1,200-ton (1089 metric ton) Goliath bridge crane, the largest in the Western Hemisphere;
- o New materials handling equipment including two 200-ton (188 metric ton) transporters; and
- o Completion of a new facility at Charleston, SC, especially designed for the fabrication of spherical LNG cargo tanks but also capable of fabricating a wide range of pressure vessels, drill rigs and platforms, and similar structures.

There are five building basins at the Quincy shipyard. The largest of these can accommodate a maximum ship size of 936 feet by 143 feet (285 m x 44 m). The shipyard also has extensive facilities for topside repair work. Four piers and a wet basin are available with a total dockside accessibility of 4,600 feet (1402 m). There is ample crane capacity together with all utilities and services needed for outfitting and general repair work. The building basins are available as drydocks when not in use for new construction.

In addition to its shipyard construction and repair facilities, Quincy Shipbuilding has a total capability in virtually all aspects of marine engineering and design.

Currently under construction are the last two of five new Quincy-designed maritime prepositioning ships, which will be time-chartered to the Military Sealift Command as part of the Navy's MPS program to support the Rapid Deployment Force. The first three vessels, 2ND LT. JOHN P. BOBO, PFC DEWAYNE T. WILLIAMS, and 1ST LT. BALDOMERO LOPEZ, were delivered respectively in February, June, and November 1985. The last two vessels will be delivered in March and May 1986. This is the most important newbuilding effort to get underway at Quincy since the construction of the LNG fleet back in the 1970's. However, the yard has announced that it will be closed following completion of this project due to "the present depressed conditions in the U.S. shipbuilding industry."

Employment at mid-year 1985 totaled 4,420, down from 4,900 at mid-1984.

Exhibit 11 is a current layout of the Quincy Shipbuilding Division's facilities.

11. Gunderson, Inc.

Gunderson, Inc., formerly FMC Corporation's Marine and Rail Equipment Division, originally known as Gunderson Brothers Engineering Corporation, is located on 71 acres of Willamette River waterfront property in Portland, OR. Gunderson, Inc., purchased the division from FMC Corporation in February 1985. Gunderson, also a major manufacturer of railroad freight cars, is an experienced builder of oceangoing and river barges, tugs, tankers, ferry boats, small military craft, and a wide range of marine structures.

Gunderson concentrates its marine construction capabilities on barge building, primarily ABS-classed vessels. In the first half 1984, the yard built one 340-foot (104 m) deck barge, one 258-foot (79 m) hydraulic dump barge, and completed the conversion of three 400-foot (122 m) single-deck Crowley railcar barges into similar double-deck barges capable of hauling trailers in addition to railcars. Also completed was a 273-foot (83 m) tank barge for Sause Brothers.

Gunderson's barge building yard is well equipped. In covered fabrication bays, there are six 40-ton (36 metric ton) overhead cranes. Steel modules weighing up to 200 tons (182 metric tons) are fabricated to streamline hull assembly. Other facilities include a 200-ton (182 metric ton) whirley crane, new types of state-of-the-art welding equipment, a 2,500 ton (2270 metric ton) hydraulic press, numerically-controlled burning equipment, and computerized lofting.

In 1982, the side-launch ways capacity was increased to accommodate a maximum vessel size of 800 feet by 130 feet (244 m by 40 m). Crane tracks were lengthened accordingly, and a 1,100 foot (335 m) outfitting berth serviced by two whirley cranes and railroad tracks also was acquired. Drydocking is done at the nearby Port of Portland facility.

At mid-1985, the labor force employed in marine-related work totaled only 25 due to the lack of contracts, and the yard is temporarily shut down on a care and maintenance basis although continuing to actively seek construction contracts.

Exhibit 12 is a current general arrangement drawing of Gunderson's marine construction and repair facilities.

12. Halter Marine, Inc. -- Chickasaw Division

Halter Marine, founded in 1956, is the world's foremost builder of support vessels for the offshore oil and gas industry. This New Orleans-based company has built more than 1,000 small and mid-size vessels for diversified uses throughout the world, including vessels for military applications.

In September 1983, Trinity Industries, Inc., acquired 100 percent of the stock of Halter Marine, including Halter Marine's interest in Bell Halter, Inc. In 1985, the Equitable Shipyard located in New Orleans, LA, a subsidiary of Trinity Industries, Inc., was placed under the corporate umbrella of Halter-Marine, Inc. This facility is now formally known as Equitable-Halter Division of Halter Marine, Inc.

Halter Marine's shipbuilding operation is unique. The company operates six separately managed yet centrally-controlled shipyards at the following locations on the Gulf Coast: New Orleans, Industrial Canal (also New Orleans area), Lockport, LA, Moss Point, MS, Chickasaw, AL, and Pearlington, MS.

While Halter has built few large deep-draft ships, it has this capability. At the company's Chickasaw Division near Mobile, deep-draft ships up to 550 feet by 75 feet (168 m by 23 m) can be launched. As with smaller vessels, the operation would be supported by the other Halter yards. For example, plate cutting would be done at the Industrial Canal facility, and modules and various vessel components could be manufactured or fabricated at the Lockport and Moss Point yards. The preponderance of work -- final assembly, launching, and outfitting -- would take place at Chickasaw.

Sophisticated shipbuilding techniques are used in the Halter yards, including state-of-the-art computerized lofting. Plate cutting, done at the Industrial Canal Division in support of other Halter yards, is done by numerically-controlled, high-speed plasma arc cutting machines. The company combines modular techniques with conventional shipbuilding methods.

Halter's repair and overhaul facilities are located primarily at Chickasaw. At this yard, for repair work on small vessels and drill rigs, there is a floating drydock 160 feet (49 m) in length with 120 feet (37 m) between wing walls. In the Chickasaw yard, there is a total of 2,100 feet (640 m) of pier and bulkhead space available for repair and outfitting work.

In 1982, Halter Marine delivered 53 vessels; and in 1983, 20 vessels were delivered. However, in 1984, new boat orders from offshore operators slowed considerably, with only 12 deliveries. Also during 1982-1984, seven catamaran tugs (CATUGS) were delivered at the Chickasaw yard. Each of these was joined to a 47,000-dwt. barge to form an integrated tug-barge.

In April 1985, the Navy awarded a contract to Halter for the construction of two ocean surveillance ships (T-AGOS) which are scheduled for delivery in March and July 1988. The contract has an option for up to four additional T-AGOS.

At mid-1985, employment at Halter Marine's six yards totaled 433. The total work force at the Chickasaw plant was 45.

Exhibit 13 is a general arrangement plan of Halter's Chickasaw yard.

13. Ingalls Shipbuilding Division/Litton Systems, Incorporated

The Ingalls Shipbuilding Division is located on the Gulf of Mexico at Pascagoula, MS. Ingalls is a diversified shipbuilding facility experienced in the construction, conversion, and overhaul of commercial ships and Navy warships and auxiliaries. In addition, the shipyard participates in ship system analysis and ship conceptual and detail design. Ingalls was a pioneer in the application of modular construction in the U.S. shipbuilding industry.

Shipbuilding for the U.S. Navy is now this shipyard's primary business. Specializing in highly sophisticated naval combat ships, Ingalls has become one of the Nation's foremost designers and builders of destroyers, cruisers, and amphibious assault ships.

Between 1975 and May of 1985, Ingalls designed, built, and delivered to the Navy 43 surface combatant ships. These included 31 Spruance class (DD-963) destroyers, four Kidd class (DDG-993) guided missile destroyers, five Tarawa class (LHA-1) amphibious assault ships, and three CG-47's, a new class of Aegis guided missile cruisers: the lead ship, USS TICONDEROGA, and two follow on ships, USS YORKTOWN and USS VINCENNES. During 1981 and 1982, 13 jackup drill rigs and four semisubmersible drill rigs were also delivered to six offshore drilling companies.

In April 1985, Ingalls completed the complex modernization and reactivation of the World War II battleship, IOWA.

As of October 1, 1985, the company held orders for eight additional Aegis cruisers. The last of these ships is scheduled for completion in December 1988. In May 1985, Ingalls laid the keel for the lead ship of a new class of multi-purpose amphibious assault ships, the LHD-1, an Ingalls' design. Delivery is scheduled for the first half of 1989. Ingalls also has a regular workload of Navy overhauls and repairs.

Ingalls' East Bank facility has been in operation since 1938, engaging primarily in construction of commercial cargo ships and tankers, and in 1974, completed a series of highly productive containerships, the last commercial ships built at Ingalls. The yard maintains six inclined shipways. Maximum ship sizes which can be accommodated are: Four ways 650 by 90 feet (198 m by 27), one way 690 feet by 85 feet (210 m by 26 m) and one way 550 by 80 feet (168 m by 24 m).

The East Bank facility has a graving dock which has been used for construction and overhaul of nuclear-powered submarines, but is currently being used for ship repair work. A wharf and four piers serviced by cranes with a 60-ton (54 metric ton) maximum capacity provide a total of 5,450 feet (1661 m) of berthing space for outfitting and topside repair.

The newer 600-acre West Bank facility, completed in 1970, was designed and equipped for series production using state-of-the-art modular construction methods. The yard is geared to assembly-line construction of large Navy and merchant ships.

The West Bank yard does not have conventional inclined shipbuilding ways. Instead, fabricated steel and subassemblies are brought from the fabrication, panel, and shell shops to the subassembly area where they are erected into major subassemblies and outfitted; these in turn move to the module assembly area. These areas are divided into five bays, each of which can produce 6,000-ton (5447 metric ton) modules. After modules are completed (including outfitting) in the module assembly area, they are moved to the integration area where they are erected into a complete ship. The completed ship is then moved to a floating drydock (resting on a submerged grid) which is subsequently floated and moved to a deep-water area where it is ballasted and the ship launched. The drydock can launch a maximum ship size of 850 feet by 173 feet (259 m by 53 m). Approximately 4,400 feet (1341 m) of berthing space, serviced by cranes up to 200 tons (182 metric tons) are available for outfitting.

The company's technical pioneering in shipbuilding is continuing with the use of computer-aided design and manufacturing systems, such as integrated CAD/CAM, to streamline and automate the process of designing and building modern ships.

Ingalls Shipbuilding Division at mid-1985 employed a total labor force of 11,550, up from 9,730 a year earlier.

Exhibits 14 and 15 are current general arrangement plans of facilities in the Ingalls East Bank and West Bank Yards.

#### 14. Lockheed Shipbuilding Company

Lockheed Shipbuilding, a wholly owned subsidiary of Lockheed Corporation, is located in Seattle, WA, on the southern perimeter of Puget Sound's Elliott Bay. This 95-year-old shipyard was known as Puget Sound Bridge and Drydock Company when acquired in 1959 by Lockheed. In 1965, the company's name was changed to Lockheed Shipbuilding and Construction Company and was changed again in early 1984 to its present name.

At Lockheed's Seattle plant a wide variety of vessels have been constructed, including light cruisers, destroyers, patrol frigates, ammunition ships, amphibious transports, oil drilling vessels, the world's largest hydrofoil, a large bulk carrier, a roll-on/roll-off ship, and several ferries. In 1976 and 1977, Lockheed delivered two U.S. Coast Guard icebreakers, the POLAR STAR and the POLAR SEA, the world's most powerful non-nuclear icebreakers.

With the scarcity of commercial ship orders, the Navy has again become Lockheed's best customer. In March 1979, the yard delivered its first naval vessel in six years, the submarine tender EMORY S. LAND (AS-39). A second tender, the FRANK CABLE (AS-40), was delivered in September 1979; and the third, the MCKEE (AS-41), was delivered in July 1981.

Lockheed is the lead yard in the construction of a new class of amphibious dock landing ships. In 1981, the Navy awarded the company the contract to support the design as well as to build the first of the class, the WHIDBEY ISLAND (LSD-41). As of October 1, 1985, Lockheed was also building two additional LSD's, the GERMANTOWN (LSD-42), and the FORT MCHENRY (LSD-43), which are scheduled for delivery in January 1986 and June 1987.

In September 1985, the Navy awarded Lockheed a contract for the construction of two air-cushion landing crafts (LCACs) with deliveries scheduled for April and November 1988. Lockheed plans to construct the LCACs at its new Gulfport, MS, facility although the design and engineering work on this contract will be accomplished in Seattle.

During the first nine months of 1985, the company's repair and overhaul work consisted almost entirely of Navy contracts. Commercial repair work was at its lowest volume in several years.

Lockheed Shipbuilding's Industrial Products and Services Division is equipped to do heavy custom steel work, including structural and plate work, and a wide range of fabrication work.

Lockheed builds and outfits ships in two yards adjacent to Seattle's deepwater port. The yards offer a full range of facilities, engineering, and craft skills. To improve shipbuilding technology to meet requirements for construction of complex naval vessels, Lockheed has upgraded its production facilities and has accomplished system changes. To handle the increased production rate, Lockheed installed a modernized, numerically controlled steel cutting system and a semi-automatic steel fabrication panel line.

The yard operates three inclined shipways, two of which can accommodate a ship up to 650 feet by 88 feet (198 m by 27 m), and one which can handle a ship as large as 690 feet by 90 feet (210 m by 28 m). These building ways are serviced by 10 whirley cranes varying in capacity from 28 tons (25 metric tons) to 50 tons (45 metric tons). Lockheed maintains one floating drydock which can accommodate a maximum ship size of 643 feet by 96 feet (196 m by 29 m). Also available is 6,500 feet (1981 m) of wharf and pier space that is used for both repair and outfitting. Whirley cranes up to a capacity of 100 tons (90 metric tons) service the wharf and pier areas. Multiple crane lifts and locally available floating cranes routinely provide capacities up to 400 tons (363 metric tons).

Lockheed's labor force at mid-1985 totaled 2,047, down from approximately 2,800 a year earlier.

Exhibits 16 and 17 are current general arrangement drawings of this Seattle yard's Plant No. 1 and Plant No. 2.

15. Marathon LeTourneau Company - Gulf Marine Division

Marathon Manufacturing Company, a world leader in production of offshore drilling rigs, launched its new Gulf Coast shipyard, the Gulf Marine Division, in 1971 with a commitment of several million dollars. This 133-acre shipyard is located in Brownsville, TX, and has a 2,500-foot (762 m) frontage on the Brownsville ship channel. Since it was founded, this Marathon yard has built and launched semi-submersible and jackup drilling rigs totaling more than 150,000 tons of production, and has the capability to build and launch drill ships, crane barges, work boats, tugs, and large commercial vessels. The Gulf Marine Division's total marine construction and repair capabilities are supported by Marathon's Engineering Group in Houston and by Marathon's manufacturing facilities in Longview, TX, and Vicksburg, MS.

The Gulf Marine Division provides major repair, modification, and conversion work on offshore drilling rigs and other oceangoing vessels at Brownsville and has sent repair and maintenance teams to locations around the world. The yard can also fabricate packaged mobile power plants and other types of equipment as well as perform heavy metal fabrication.

One jack-up rig was delivered at Marathon's Brownsville yard in 1984, and another was delivered during the second quarter of 1985 to Penrod Drilling Company. Since then, there have been no new construction contracts and the yard has been engaged in rig maintenance and repair work.

The Brownsville yard operates one launchway with a maximum vessel size of 1,100 feet by 150 feet (335 m by 46 m) on which oceangoing ships could be constructed in the event of national emergency. Steel plate and other materials move from a 400,000 square-foot (37160 m<sup>2</sup>) in-yard storage area and from four warehouses through a 450-foot by 240-foot (137 m by 73 m) plate shop equipped with a 55-foot (17 m) wide automated panel line. Modular construction techniques are combined with conventional shipbuilding methods. Large module sections are fabricated on a forming and subassembly slab about 400 feet by 200 feet (122 m by 61 m), which is actually an extension of the yard's building way. A 250-ton (227 metric ton) gantry crane travels on rails which run the full length of the slab and the building way. The crane lifts the subassembly sections from the slab to the launchway, and the sections are joined to form the completed vessel which is then side-launched. The 250-foot by 120-foot (76 m by 37 m) covered pipe shop has a complete range of positioning, welding, and cutting equipment. Usable berthing space for outfitting and repair totals 1,100 feet (335 m).

At mid-1985, the total work force at the Brownsville plant was 425, down from 733 a year earlier.

Exhibit 18 is a plot plan of the yard's construction facilities.

16. Marine Power & Equipment Company, Inc.

This medium-size shipyard, in business in Seattle, WA, since 1946, is capable of construction, conversion, and repair of a wide variety of vessels, including towing, fishing, oil survey and support vessels, ferries, oil rigs, and Government ships. Marine Power & Equipment Company (MPE) is a subsidiary of WFI Industries, Inc., of Seattle.

MPE is a full service shipyard complete with drydocks, fabricating and welding shops, machine shops, electrical and electronic shops, and other shops and essential marine oriented services.

From 1979 through 1982, the company's principal ship construction consisted of six passenger/car ferries for the State of Washington.

From 1983 through 1984 several oceangoing barges and tugs and 28 LCM's (landing craft) for the Navy were built at MPE. The largest vessels built were two state-of-the-art triple deck RO/RO barges for Seaway Express. These barges, for service to Alaska, are 487 feet (148 m) in length.

In production, as of October 1, 1985, were two 150-foot (48 m) tugs. Repair work during 1985 consisted of both commercial and military work.

Although Marine Power's shipbuilding and repair complex comprises five yards, new construction work for vessels over 475 feet (145 m) in length is done in Yard 4 with support available from other divisions. The company operates seven building ways, and the maximum size vessel that can be built is 500 feet by 104 feet (152 m by 32 m).

In this yard, modular construction techniques are combined with conventional shipbuilding methods. Production facilities have been upgraded by the installation of a modernized numerically controlled steel cutting system and a semi-automatic steel fabrication panel line. CAD/CAM systems are used for lofting and design, and a Vision IV system is used for cost scheduling and control. Laser control alignment is used.

During construction of a deep-draft ship from 400 to 500 feet (122 to 152 m) in length, advanced zone-outfitting techniques would be used. Construction and launching would be in the company's Yard 4 where a 4,000-ton (4064 metric ton) capacity syncrolift is available for launching or retrieving vessels. Adjacent to the syncrolift is a building site which consists essentially of a flat concrete slab of sufficient dimensions to accommodate one ship. The syncrolift, since it is not sufficiently long for a large vessel in excess of 500 feet (152 m), would need to be extended in length for longer vessels. Movement of the ship from the construction site to the adjacent launching position would be accomplished by hydrolift. A film of water is introduced in between the lifting platform and the



concrete slab to reduce friction, and trucks and/or winches would be used to push or pull the vessel sideways onto the syncrolift. This construction method and the hydrolift movement were used successfully in the construction of the six Washington State ferries and oceangoing barges up to 487 feet (148 m) in length.

In addition to the syncrolift, the company operates seven floating drydocks, the largest of which can handle vessels up to 400 feet by 57 feet (122 m by 17 m). Usable berthing space for outfitting and repair work totals 4,280 feet (1305 m).

Total employment at Marine Power & Equipment Company in July 1985 was 250, compared to 1,100 a year earlier. Total employment at Yard 4 was 125.

Exhibits 19 is a current general arrangement plan of Yard 4 where the company's new construction work for vessels 475 feet (145 m) in length is done.

#### 17. National Steel and Shipbuilding Company

National Steel and Shipbuilding Company (NASSCO), the largest shipbuilder on the West Coast, participates in the commercial and U.S. Navy shipbuilding, repair and conversion markets. In the marine business since 1945, the company has expanded several times to occupy 145-acres on the harbor in San Diego, CA. NASSCO is wholly owned by Morrison-Knudsen Company of Boise, ID.

In the past, NASSCO has constructed special purpose ships such as ferries, an oceanographic research ship, special purpose barges, passenger ships, tugs, minesweepers, dry cargo ships, and a variety of Navy vessels.

From 1973 to October 1, 1984, NASSCO completed two San Clemente class (80,500 dwt.) oil/bulk/ore carriers, six Coronado class (38,300 dwt.) tankers, 13 San Clemente class (90,000 dwt.) tankers, four San Diego class (188,500 dwt.) tankers, three Carlsbad class (37,500 dwt.) tankers, three La Jolla class product carriers (44,000 dwt.), and two Ingram class (37,500 dwt.) product carriers. The San Diego class tankers were the largest vessels ever built on the West Coast. In July 1983, the company delivered the SHENANDOAH (AD-44), the last of a series of four Gompers class destroyer tenders built at NASSCO; and in March 1984, a large cable repair ship, the ZEUS (T-ARC-7), was delivered to the Navy.

The last commercial newbuilding to leave the yard was the 37,500-dwt. product tanker HUNTER B. ARMISTEAD, delivered in June 1983. However, in August 1984, Exxon Shipping Co. signed a contract with NASSCO for construction of two new 209,000-dwt. crude oil carriers which will provide work at the yard until early 1987.

Recent deliveries by NASSCO consisted of ships being reconstructed, as described in the following paragraphs, under the ongoing Navy T-Ship program.

In 1982, NASSCO was awarded contracts to convert three Waterman RO/RO containerships into maritime prepositioning ships to support the DOD Rapid Deployment Force. The first of these ships, renamed the SGT. MATEJ KOCAK, was redelivered in October 1984. The second and third Waterman ships, renamed the PFC. EUGENE A. OREGON and the MAJ. STEPHEN W. PLESS, were redelivered in January and May 1985, respectively.

In 1982, the Navy awarded NASSCO contracts to reconstruct three former Sea-Land SL-7 class containerships into T-AKR fast sealift ships. The first of the ships, the USNS ALGOL (T-AKR 287), was completed and turned over to the Navy in June 1984. The second vessel, the USNS BELLARIX (T-AKR 288), was redelivered to the Navy in September 1984. The last of the three T-AKR's, the USNS REGULUS (T-AKR 292), was redelivered in August 1985.

In 1983, the Navy awarded contracts to NASSCO to convert two 90,000-dwt. San Clemente class tankers into 1,000-bed hospital ships (T-AH). The first ship is expected to be redelivered in February 1987, and the second ship is scheduled for completion in November 1987. Work started on the first vessel in July 1984 and on the second vessel in April 1985.

Repair and overhaul work in 1985 consisted entirely of Navy contracts.

In the fourth quarter of 1983, NASSCO placed in operation a new 25,000-ton (25400 metric ton) floating drydock which has enabled the yard to respond more fully to both Navy and commercial ship repair markets. Additionally, a large graving dock at the nearby U.S. Naval Station, that is capable of handling a maximum ship size of 687 feet by 85 feet (209 m by 26 m), can be leased by NASSCO on a use basis.

NASSCO's facilities include a building dock in which ships up to 980 feet by 170 feet (299 m by 52 m) can be constructed. In addition, the company operates three inclined building ways. Two of these can accommodate a maximum size ship of 900 feet by 106 feet (274 m by 32 m) and one a ship size of 690 feet by 90 feet (210 m by 27 m). Cranes are available that can provide lifts up to 175 tons (159 metric tons). Berthing is available at 10 full-service berths that can accommodate ships with drafts up to 35 feet (10.6 m) and lengths up to 1,000 feet (305 m).

The company's fabrication and assembly facilities cover 143,000 square feet (13284 m<sup>2</sup>) of fabrication and subassembly area and have approximately a 2,000-ton (1816 metric ton) per week capacity.

As of mid-1985, the total labor force was 4,630, down from 4,770 in mid-1984.

Exhibit 20 is a current NASSCO plot plan.

## 18. Newport News Shipbuilding

Newport News Shipbuilding, located at the Port of Hampton Roads in Newport News, VA, is the largest shipbuilding complex in the United States. The company, founded in 1886, is a subsidiary of Tenneco, Inc. Newport News has built 23 aircraft carriers, 37 nuclear-powered submarines, and 121 other surface ships for the U.S. Navy. Commercial vessels delivered by the yard include 71 cargo ships, 84 tankers, 62 passenger ships (most notably the famed superliner UNITED STATES), and more than 60 other vessels. Newport News was a pioneer in the field of jumboizing ships, and since 1957 has completed 33 such operations. A leader in the application of high technology to shipbuilding, the company provides a variety of engineering and design services to the Navy.

Newport News is the Nation's foremost builder of Navy nuclear warships. The yard as of October 1, 1985, was at work on three Nimitz class aircraft carriers and eight attack submarines. Overhaul and repair of nuclear-powered submarines and surface ships for the Navy is also a principal activity at Newport News. The last commercial vessel built in the yard was the CHEMICAL PIONEER, delivered in September 1983.

The company's continuing multimillion-dollar capital investment program was highlighted by the completion in 1982 of a new 1,334-foot (407 m) pier complex with two 30-ton (27 metric ton) cranes. Capability has been provided for transferring, via transfer rail, one 30-ton (27 metric ton) crane for use at Drydock 1. A new electroplating facility became available in mid-1983. Capabilities include zinc, cadmium, lead, copper, chrome, silver and nickel plating. Chemical cleaning, pickling, stripping, buffing, and polishing are also available. Other major improvements include upgrading and renovation of outfitting piers and older drydocks.

In July 1983, Newport News announced plans to build a new \$300 million submarine construction and repair complex. The facility will be used mainly for nuclear attack submarines and will be completed in 1988. The project will involve four new building ways, a major new construction facility under cover, the addition of a new launching dock, a 900 metric ton crane, and a 600-foot (183 m) floating drydock.

The 150-acre North yard was designed for high production and efficiency and has the capability to handle large components from fabricating areas to final erection. Data storage and retrieval systems control material storage and work flow. The building basin, the largest in the Nation, is 1613 feet (492 m) long, 250 feet (76 m) wide, and 33 feet (10 m) deep. The addition during 1982 of two 30 metric ton cranes and a third position for the intermediate gate further expands the multi-ship construction capability of this dock, permitting simultaneous ship construction and repair. A 900 metric-ton 23-story Goliath gantry crane, one of the largest in the world, can handle completely outfitted assemblies. This crane services the graving dock and the final assembly platen and has a height of 234 feet

(71 m) overall, a girder clearance of 200 feet (61 m) and a span between rail centers of 540 feet (165 m). The North yard has one 1,670-foot (509 m) outfitting berth and one 950-foot (290 m) outfitting berth each of which had one additional 30 metric-ton crane installed during 1982.

The older South yard has two inclined shipbuilding ways; the larger of these can each accommodate vessels as large as 715 feet by 93 feet (218 m by 28 m). In the South yard, there are six graving docks in operation, two of which are used for construction work and are serviced by a 310 long ton (315 metric ton) gantry crane. The larger of these two basins can handle ships up to 1,100 feet by 130 feet (335 m by 40 m). The other four of the six graving docks in the South yard are used mainly for ship repair and overhaul work. Seven piers for outfitting and topside repair are available with a combined berthing space of approximately 12,000 linear feet (3658 m). These piers are serviced by cranes with capacities of up to 50 tons (45 metric tons) and are supplemented by locomotive cranes and floating derricks with capacities to 67 tons (61 metric tons).

Newport News Shipbuilding also has the following facilities which are utilized in ship construction and repair, manufacturing, and industrial work:

- o A steel fabrication shop where various types of steel and other metals ranging in thickness from 1/8 inch (3 mm) to six inches (152 mm) up to 45 feet (14 m) long and weighing as much as 17-1/2 tons (16 metric tons), are cut and shaped to design specifications;
- o A fully-equipped wood pattern shop facility;
- o One of the largest foundries in the Nation where steel castings weighing as much as 145,000 lbs. (65772 kg) and alloy steels, copper, nickel, aluminum, brass, and other nonferrous alloys are poured;
- o A machining complex with over 250 machines including a 42-foot (13 m) boring mill, and lathes with maximum swing of 124 inches (3150 mm) diameter and lengths up to 68 feet (21 m) between centers.
- o A large pipe fabrication facility with machines capable of bending pipe up to 12 inches (305 mm) in diameter, horizontal boring mills, automatic welding machines, cleaning equipment and nondestructive and hydrostatic testing capabilities;
- o A large sheet metal facility capable of manufacturing sheet metal components required for outfitting ships and other similar applications.
- o Electrical switchboard and panel shops capable of manufacturing large and small electrical switchboards and panels; and

- o A computer center, testing laboratories, and over 1,000,000 square feet (92900 m2) of inside storage including a 106,000 square foot (9847 m2) automated material storage facility.

The labor force at Newport News in July 1985 totaled 30,000.

Exhibits 21 and 22 are current general arrangement drawings showing major facilities in both the South yard and the North yard.

19. Norfolk Shipbuilding & Drydock Corporation

Norfolk Shipbuilding & Drydock Corporation (Norshipco) has three shipyards in the City of Norfolk. The largest of the three, the Berkley Plant covers 120 acres and is located on the Southern branch of the Elizabeth River. The other two shipyards, Brambleton and Southern Plants, are on the Eastern branch of the Elizabeth River.

Norshipco's yards are among the best equipped on the East Coast. Available ship repair functions include tank cleaning and coating, machinery, electrical, carpentry, steel, piping, nondestructive testing, blasting and painting. The company also offers a full range of repair service for ships located away from its yards.

This company has sophisticated new construction experience, as demonstrated in the construction of two U.S. Coast and Geodetic Survey (now National Ocean and Atmospheric Administration) vessels in the late 1960's and a Navy patrol frigate in 1975. Modern modular construction techniques are used in all construction and conversion work, including oceangoing vessels, barges, dredges, and fabricated midbodies.

In 1981, Norshipco delivered the diesel-powered oceangoing hopper dredge YAQUINA to the Corps of Engineers. During 1982, three major construction projects were completed: (1) a large passenger ferry; (2) a new fully-equipped 2,800-ton (2845 metric ton) floating drydock for use in the company's Brambleton yard; and (3) delivery of the 6,500 dwt. RO/RO ATLANTIC to the Maritime Administration. The RO/RO ATLANTIC, as an unfinished barge, was removed from the defunct Seatrain yard in Brooklyn, NY, and towed to Norshipco for completion and joining to the completed tug.

In May 1985, Norshipco delivered a 100-car ferry to the Delaware Transportation Department. During 1983, 1984, and the first three quarters of 1985, the company's repair and overhaul business, continued at a steady pace. During the past year, Navy phased maintenance contracts and Navy selected repair availability (SRA) work have been especially beneficial to Norshipco as there is no new construction work underway.

A multi-faceted expansion program emphasizing repair operations was completed in 1979 at the Berkley Plant. The centerpiece of the project was a steel floating drydock, among the largest and most modern in the world. The drydock is 950 feet (290 m) long, 192 feet (59 m) wide, and 160 feet (49 m) between the wingwalls. Lifting capacity is 54,250 long tons (55118 metric tons). A new concrete pier, 1,030 feet (314 m) in length, is used for repair and servicing of ships as long as 1,200 feet (366 m). This new pier is used for mooring the large floating drydock. A giant Kroll L-1800 hammerhead jib trolley crane is located on this pier and spans the width of the floating drydock. The crane is also able to service ships alongside the pier.

During 1984 and 1985, Norshipco's ongoing capital investment program continued, with expansion and modernization of its plants. One significant addition was the purchase and installation of a one-piece, steel floating drydock to replace the 40-year old, six-section 12,000 ton (12,200 metric ton) capacity wooden drydock in the Berkley Plant. The new drydock can accommodate a vessel up to 670 feet by 90 feet (204 m by 27 m) with a lifting capacity of 20,000 long tons (22334 metric tons).

For major ship construction, the company's Berkley Plant operates a building way which can accommodate ships as large as 475 feet (145 m) in length by 85 feet (26 m) beam. The vessels are constructed on the flat building position and end-launched in one piece hydraulically into a floating drydock.

The largest of the company's marine railways, located in the smaller Brambleton Plant, can accommodate a vessel 441 feet by 60 feet (134 m by 18 m) with a lifting capacity of 5,500 long tons (5580 metric tons).

At the company's yards, a total of 12,170 feet (3709 m) of berthing space is available at several piers for outfitting and repair.

Norshipco's payroll totaled 2,770 in June 1985, down slightly from 2,890 a year earlier.

Exhibit 23 is a current plan of the Berkley Plant, the largest of the company's three plants.

## 20. Pennsylvania Shipbuilding Company

Pennsylvania Shipbuilding Company came into existence in February 1982 when its parent company, Paden, Inc., acquired this Chester, PA, yard from the ailing Sun Ship, Inc. In April 1984, a private investment group, based in Mobile, AL, and headed by Tom Weller, Jr., purchased a "substantial interest" in Paden, Inc.

Pennsylvania Shipbuilding Company is one of the largest and best equipped shipyards in the country. It covers 185 acres on a mile of the Delaware River waterfront, just south of Philadelphia, PA.

In its 63 years of operation, the Sun yard designed and constructed more than 650 vessels, mainly commercial ships. In later years the yard specialized in the design and construction of RO/RO ships and medium-size tankers. In addition to its shipbuilding, conversion, and repair capabilities, the company also manufactured heavy industrial products.

In early 1981, Sun Ship announced its decision to phase out its ship construction business and concentrate on ship repair and conversion. At that time the company had three RO/RO containerships under construction or on order for Waterman Steamship Corporation. Sun completed the first vessel, the JOHN B. WATERMAN. The second ship, the CHARLES CARROLL, was built for Sun by General Dynamics, Quincy; and the third ship, the THOMAS HEYWARD, was built for Sun by Pennsylvania Shipbuilding and was delivered in February 1983.

In June 1984, Pennsylvania Shipbuilding completed the major conversion for the Navy of a former Sea-Land SL-7 containership to a fast sealift ship (T-AKR) for the DOD Rapid Deployment Force. This vessel, renamed the USNS CAPELLA (T-AKR 293) is 946 feet (288 m) in length overall. Pennsylvania Shipbuilding started work in October 1983 on the conversion of a sistership, the USNS DENEbola (T-AKR 289). This fast sealift ship was redelivered to the Navy in October 1985.

In May 1985, Pennsylvania Shipbuilding was awarded a contract by the Navy for the construction of two T-AO fleet oilers. The first vessel is scheduled for delivery in February 1989 and the second in November 1989. This was the first new construction contract awarded to the yard since June 1979.

In June 1985, Pennsylvania Shipbuilding retained the services of IHI, a major Japanese shipbuilder, to assist in production planning and implementation of modular construction and preoutfitting techniques.

In 1976, completion of a major capital improvement program enhanced Sun Ship's ability to fabricate larger, more sophisticated ships. This program provided a new level shipbuilding platform, a two-section floating drydock capable of lifting 75,000 long tons (76200 metric tons), a 1,100-foot (335 m) outfitting pier, and other shipbuilding support facilities. The new level shipbuilding slab has two sections. On Slab "A", a ship 1,000 feet by 195 feet (305 m by 59 m) can be built. In this shipyard, a ship as large as 1,100 feet (335 m) in length and 195 feet (59 m) wide can be constructed. This is the maximum limit of the large floating drydock into which vessels built on the two-section shipbuilding platform are launched. Two halves of a large ship can be built on this platform and each half can be rolled individually to the drydock and then welded together. The ship is brought to the pier for outfitting and completion. The large drydock, which is capable of handling vessels up to about 300,000 dwt., is one the world's largest floating drydocks. It is serviced by two 23-ton (21 metric ton) gantry cranes, two 10-ton (9 metric ton) gantry cranes, two 25-ton (23 metric ton) truck cranes, and an 800-ton (726 metric ton) barge crane with a 230-foot (70 m) boom.

In September 1982, in order to handle an increasing volume of repair and overhaul work, Pennsylvania Shipbuilding purchased and moved a medium-size floating drydock from Levingston Shipbuilding Company, its affiliate in Orange, TX, to the Chester, PA, plant.

A new modernization and expansion program, completed in 1980, improved the yard's fabrication shop facilities, which are now capable of approximately a 60,000-ton (54468 metric ton) annual steel throughput.

In addition to the two-section shipbuilding platform, two conventional sliding ways are available. Each can handle a ship as large as 825 feet by 136 feet (251 m by 41.5 m). The yard has a total of about 3,900 feet (1189 m) of usable berthing space with modern facilities at six deepwater piers.

Employment at Pennsylvania Shipbuilding totaled 1,190 at mid-1985, compared with 1,120 a year earlier.

Exhibit 24 is the latest available layout of the plant and facilities at Pennsylvania Shipbuilding Company.

## 21. Portland Ship Repair Yard

The Portland Ship Repair Yard is part of the Municipal Corporation of the Port of Portland. The 125-acre shipbuilding and ship repair facility is located in Portland, OR, on the Willamette River. It and the major marine terminal facilities of the Port are reached via the Columbia River--a 106-mile passage from the Pacific Ocean and a 40-foot (12 m) deep and 600-foot (183 m) wide navigation channel.

The Portland Ship Repair Yard was developed from the World War II Swan Island Shipbuilding facilities which employed 132,000 persons and delivered 1,076 ocean-going ships. The shipyard currently employs 2,000 persons primarily engaged in major ship repair and the construction and drydock-launch of on-shore Alaskan oil production modules up to 2,500 tons (2542 metric tons) each. In 1975, the shipyard constructed two 80-foot by 400-foot (24 m by 122 m) self-unloading covered barges.

The Portland Ship Repair Yard has no current orders for shipbuilding. However, this market is being aggressively pursued. Recently, the shipyard added an 81,000 ton (82353 metric ton) floating drydock, the largest drydock on the West Coast, and 3,000 feet (914 m) of modern deepwater repair and outfitting wharves with five whirley cranes 75 to 120 tons (68 to 109 metric tons) capacity. The maximum combined crane lift capacity is 220 tons (200 metric tons).

The shipbuilding facilities at the Portland Ship Repair Yard are capable of producing modular type units from 1,500 to 5,000 tons (1525 to 5084 metric tons), which are transported by rubber-tired vehicles, crawler or walker, via launching bridge to two locations. At one ship construction location, a vessel 475 feet by 100 feet (145 m by 30 m) can be constructed using the No. 3 drydock for launching. At the other location, (when facilities



now under construction are completed) a vessel up to 810 feet by 108 feet (247 m by 33 m) can be constructed using the No. 3 and No. 4 drydocks for launching.

Portland Ship Repair Yard operates four drydocks. The largest two (No. 3 and No. 4) can accommodate vessels up to 1150 feet by 181 feet (351 m by 55 m) and 810 feet by 108 feet (247 m by 33 m), respectively. A total of 6,900 feet (1798 m) of fully serviced pier space with 14 whirley type cranes are employed for outfitting.

The Portland Ship Repair Yard has 500,000 square feet (46450 m<sup>2</sup>) of fully-enclosed service shops and warehouse space. The 11 module assembly bays are 323 feet (98 m) long, 70 feet (21m) wide (clear), 60 feet (18 m) high (clear).

The Portland Ship Repair Yard is preparing to expand its modular construction capability by an additional 75 acres, located about six river miles downstream at its Rivergate Industrial Park. This facility will be suitable for constructing ship modules to 5,000 tons (5084 metric tons) which can be crawler transported, barge loaded, and joined and launched on No. 4 Drydock.

The shipbuilding assets of the Portland Ship Repair Yard are augmented by the individual facility user's assets. Gunderson, Inc., Northwest Marine Iron Works, Dillingham Ship Repair, Lockport Marine Company (a subsidiary of Lockheed Corporation), and Daniel Construction (a subsidiary of Fluor Corporation), all are contracted users of the facility.

Although, there have been no new construction contracts awarded to the Portland Ship Repair Yard, two of its individual facility users have recently won contracts for Navy vessel overhauls and conversion. Northwest Marine Iron Works won a contract for the overhaul of the USS CUSHING (DD-985), a Spruance-class destroyer, and the USS DULUTH (LPD-6), an Austin-class amphibious transport dock, with redelivery scheduled for June and July 1986, respectively. Dillingham Ship Repair was awarded a contract in September 1985 for the conversion of the PRESIDENT POLK to an auxiliary crane ship for the Navy. The vessel is scheduled to be redelivered in October 1986 and renamed the GRAND CANYON STATE. During the first half of 1985, work at the Portland Ship Repair Yard centered on servicing the Alaskan VLCC fleet and other commercial vessels, although there was some work done on Navy and Coast Guard vessels.

Exhibit 25 is a current general arrangement plan of the Portland Ship Repair Yard facility and ship repair assets.

## 22. Tacoma Boatbuilding Company

In operation since 1926 in Tacoma, WA, this shipyard designs, constructs, and repairs vessels for commercial customers, the Navy and Coast Guard, and foreign governments. Tacoma Boat's overall facilities consist of three yards covering about 70 acres of leased or company-owned land located in the Commencement Bay area.

World War II transformed Tacoma Boat from a builder of fishing vessels into one of many Government shipbuilders on the West Coast. In addition to the conversion of military vessels during this period, the company constructed 23 small naval vessels and support craft.

Tacoma Boat has grown continuously through the years, producing a diversified construction pattern including a variety of standard-class tuna purseiners, a semisubmersible offshore oil-drilling rig, barges and tug/supply vessels for the offshore oil industry, WYTM icebreaking tugs for the Coast Guard, revolutionary-design tractor tugs, and high-speed patrol ships, gunboats, and minesweepers for the Navy and/or foreign governments. The company also helped design and build an 80-knot surface effect ship (SES).

In 1984, Tacoma delivered the third and fourth medium endurance Coast Guard cutters (WMECs), the HARRIET LANE and the NORTHLAND. The first two, the BEAR and the TAMPA, were delivered in 1983.

Also in 1984 and 1985, Tacoma delivered the first seven of 12 ocean surveillance ships (T-AGOS) to the Navy, the STALWART, the CONTENDER, the VINDICATOR, the TRIUMPH, the ASSURANCE, the PERSISTENT, and the INDOMITABLE. This 12-ship T-AGOS contract has become a focal point for zone outfitting in which various portions or "zones" of a ship are built separately as virtually complete units and then assembled at the launchway.

In September 1985 Tacoma filed for protection under Chapter 11 of the U.S. bankruptcy law. As of December 1, 1985, outstanding ship construction contracts consisted of five T-AGOS ships for the Navy, two 6,200-dwt. incinerator ships for At-Sea Incineration, and two corvette missile ships for the Government of Thailand.

The company also designs and manufactures deck machinery and fabricates controllable-pitch propeller systems under license from Escher Wyss, a West German firm.

To broaden the company's shipbuilding base, Tacoma Boat expanded its operations in 1980 to include a third yard near its repair yard on Commencement Bay. In addition to the acquisition of an 8,000-ton (8128 metric ton) floating drydock and installation of a large side-launch building way, CAD/CAM (Computer-Aided Design and Computer-Aided Manufacturing) introduced in 1981, is used in conjunction with zone outfitting construction techniques. The Navy T-AGOS program is the first Tacoma Boat contract to use zone outfitting exclusively.

Tacoma Boat's facilities include four end-launch construction ways and a new side-launch way fitted with a marine railway and serviced by a 200-ton (184 metric ton) whirley crane. This new building way, which became operational in 1982, permits launching of ships, barges or drill rigs up to 650 feet (198 m) in length. Its width is about 400 feet (122 m). The facility launches into water 20 feet (6 m) deep.

The company operates two floating drydocks. The larger of the two can handle vessels up to 540 feet by 74 feet (165 m by 23 m) and has a lifting capacity of 8,000 tons (8128 metric tons). Available for outfitting and repair work is 4,200 feet (1280 m) of berthing space.

Total work force at Tacoma Boat at mid-1985 was 1,440, down from 1,770 a year earlier. However, substantial lay-offs occurred in 1985 as a result of cash-flow problems.

Exhibits 26 and 27 are current general arrangement drawings of the company's three yards.

23. Tampa Shipyards, Incorporated

Founded in 1948, Tampa Shipyards, Inc., (formerly Tampa Ship Repair and Drydock Co.) is a full-service yard and is the largest shipbuilding and repair facility in Florida. It was purchased by The American Ship Building Company in 1972 and is located on the recently deepened 43 foot (13 m) Sparkman Channel in Tampa, FL.

During World War II, the company built Navy auxiliary vessels and C2 cargo ships for the Maritime Commission. Since World War II, Tampa Ship has been a major Gulf Coast repair yard, serving many of the tanker fleets operating on the Gulf and repairing cargo ships, barges, and a wide range of oceangoing vessels.

In July 1981, Tampa Ship's parent company, The American Ship Building Company, was awarded a \$73 million contract to convert four Moore McCormack C4 cargo ships (with the aid of CDS) to larger self-sustaining breakbulk/container vessels. The first ship was redelivered by Tampa Ship in August 1982, and the second was completed at the company's Lorain Yard in October 1982, with the third and fourth completed at Tampa in December 1982 and June 1983.

The American Ship Building Company, under contracts signed June 30, 1983, with Ocean Carriers, Inc., is currently building the last two of five new 30,000-dwt. clean-product, ice-strengthened tankers for charter to Military Sealift Command. The preponderance of work is being accomplished at Tampa Shipyards, although Avondale Shipyards built the forebodies and ADDSCO Industries completed the deckhouse steel work. Final assembly and outfitting takes place at Tampa Ship. The first three T-5 tankers, the PAUL BUCK, the GUS W. DARNELL, and the SAMUEL COBB, were delivered in June, September, and November 1985, respectively. The last vessel is scheduled to be delivered in May 1986.

In order to compete in today's highly technical shipbuilding industry, Tampa Shipyards embarked on an innovative, expansion program. During 1984, major new facility installations were completed and integrated into the current ship construction program.

Recent additions include: a new concrete pier, two graving docks, two wet berths, additional shops, and an erection/assembly building. The erection/assembly building is 600 feet by 145 feet by 115 feet (183 m by 44 m by 35 m), and is serviced by two 250-ton (227 metric ton) overhead bridge cranes. About 350 feet (107 m) of this building straddles one of the new graving docks, allowing pre-assembled units weighing up to 500 tons (508 metric tons) to be erected in a totally enclosed environment.

The company currently has four graving docks operational. The largest can handle ships up to 896 feet by 146 feet (273 m by 45 m). Two of these four graving docks went into service in the third quarter of 1984. Each of the two new drydocks can accommodate a vessel as large as 746 feet by 121 feet (227 m by 37 m).

To provide additional fabricating capability, Tampa Ship has acquired a long-term lease on the Westinghouse heavy steel fabricating facility on Tampa's Westshore. This facility provides 11 acres of covered fabrication floor, bridge cranes from 200 to 700 ton (182 to 635 metric ton) capacity, and barge loading facilities. The building is two hours by tow from Tampa Ship.

Tampa Ship currently leases two wet berths north of the main yard at South Slip. These wet berths are 840 feet (256 m) and 700 feet (213 m) long and are leased from Tampa Port Authority and Tampa Electric Company.

The yard is also upgrading other areas including modernization of the steel fabricating, sheet metal, carpentry, machinery, electrical, and pipe departments, as well as blasting and painting facilities.

As of mid-1985, 1,760 people were on the Tampa payroll compared to 900 in mid-1984.

Exhibit 28 is a general plan of Tampa Ship's main yard. Neither the South Slip nor the Westinghouse facility is shown.

#### 24. Todd Shipyards Corporation - Galveston Division

The Galveston Division of Todd Shipyards Corporation was founded in 1934 on Pelican Island on the Galveston Ship Channel. The yard, located directly across from the City of Galveston, TX, is a ship construction, repair, and conversion complex with a work force experienced in custom industrial steel fabrications. The shipyard was awarded the Navy's "E" Award for its substantial contribution during World War II in the field of ship repair.

In the past decade, this Todd facility has become an important part of the Gulf Coast oil drilling industry, turning out an impressive inventory of modern oil-related ships, barges and specialized craft. The most outstanding of these vessels was the APACHE, a large self-propelled, pipelaying reel ship for Santa Fe International Corporation. Completed in 1979, this was the first ship of its kind ever constructed.

Ship repair and overhaul have for many years been a major segment of work at Galveston; but conversion work has also been a mainstay of the company. Over the past 15 years, 25 major conversions were successfully accomplished. During 1981 and 1982, Todd's Galveston Division delivered four large oceangoing barges. In 1983 and 1984, under a contract with Bethlehem Steel, the yard installed a new midbody in the ELEO MAERSK and the EMILIE MAERSK, two Maersk Line cargo ships which were converted to maritime prepositioning ships by Bethlehem-Beaumont.

The Navy in May 1984 awarded Todd-Galveston a design contract authorizing design work on the conversion of two RO/RO containerships, MA Design C5-S-78a, to Aviation Logistics Support Ships (T-AVB), with options for their reconstruction. In December 1984, the Navy exercised the option for the first ship, the YOUNG AMERICA, which is in the yard with work underway and redelivery scheduled for February 1986. The option for the second vessel, the GREAT REPUBLIC, was exercised in December 1985 with redelivery scheduled for August 1986.

At Todd-Galveston, vessels up to 475 feet by 85 feet (145 m by 26 m) can be constructed under roof on a launching pontoon and then launched into one of the yard's floating drydocks.

In its continuing effort to increase its repair business, Todd in April 1982, also put into operation at its Galveston plant one of the largest floating drydocks on the Gulf Coast. The new 40,000 metric ton drydock, built by Kawasaki Heavy Industries, Ltd., in Japan, is capable of lifting ships as large as 225,000 dwt. and all drill rigs with beam no greater than 160 feet (48.7 m).

As a result of Todd's decision in 1983 to consolidate its Houston yard with its Galveston facility, Houston's new 17,500 ton (17780 metric ton) floating drydock was moved to the company's Galveston shipyard. This drydock, which became operational in May 1984, can accommodate vessels up to 600 feet by 118 feet (183 m by 36 m).

There are four piers at the main Galveston yard. The usable berthing for outfitting and repair work totals about 6,400 linear feet (1950 m). These piers are serviced by seven rail-mounted, revolving gantry cranes ranging from five tons (4.5 metric tons) to 75 tons (68 metric tons) that also service the platen areas. In addition to the outfitting and repair berthing piers, a new layberth with support facilities, other than gantry, was placed into operation in late 1982. This layberth can accommodate ships up to 1,000 feet (305 m) in length and 140 feet (43 m) beam.

Completing Todd's Galveston complex is the Southwest Plant support facility, located within approximately one mile (1.6 km) of the main yard with more than 90,000 square feet (8361 m<sup>2</sup>) of covered manufacturing area. This facility is serviced by two 200 ton (182 metric ton) overhead cranes which combine to make 400 ton (362 metric ton) lifts possible. The Southwest Plant is used principally for steel fabrication and hull erection and has a 200 foot by 86 foot (61 m by 26 m) slip, of which 160 feet (49 m) are covered.

As of mid-1985, total employment was 620, slightly up from about 590 a year earlier.

Exhibit 29 is a current plan of the main yard and the Southwest Plant.

25. Todd Pacific Shipyards Corporation - Los Angeles Division

Todd's Los Angeles Division is located on a city-leased 116-acre site in the West Basin of the Port of Los Angeles. This facility, formerly Los Angeles Shipbuilding and Drydock Company, was managed for the Navy by Todd beginning in 1942. Todd purchased the shipyard facilities in 1947. In 1977, the Todd Los Angeles and Seattle Divisions were organized as the Todd Pacific Shipyards Corporation, a wholly-owned subsidiary of Todd Shipyards Corporation.

The facility is a full-service, design, construction, conversion, and repair shipyard, having continually expanded over the years to fill the needs and meet the future challenges of the maritime industries and the national defense base.

During World War II, Todd-LA built 10 major Navy auxiliary ships including destroyer tenders (AD) and repair ships (AR). Since that time, this shipyard has engaged in construction, conversion, and repair of both commercial and Navy ships. On the commercial side, the company built five cargo ships, eight product tankers, and several barges and specialty craft. Commercial reconstruction included eight conversions from cargo ships to container vessels, an LPG forebody, and numerous midbody projects.

In the 1950's and 1960's, in addition to the conversion of several major Navy auxiliary ships, the yard constructed nine destroyer-type vessels. Since the late 1970's, the Navy has awarded Todd-LA contracts to build a total of 18 sophisticated guided missile frigates (FFG-7 class). As of October 1, 1985, three of these ships remained on order or in production. The last frigate is scheduled for delivery in November 1988. During the past three years, Todd-LA has performed repair and overhaul work on several types of naval combatant and auxiliary vessels, as well as post shakedown availability work on guided missile frigates.

Over the past 15 years, the yard has pursued an ongoing facilities expansion and modernization program in parallel with shipbuilding, conversion, and repair work. The inclined building ways and supporting cranes were modified from three ways, limited to 1950-60 era maritime construction and destroyer class newbuildings, to two ways capable of "Panamax" and cruiser class construction. Complementing the building ways capabilities expansion, the upland construction areas have been developed into a fully-equipped sophisticated production line, including integrated process flow lanes and work stations, prior to erection on the building ways, for fabrication and full pre-outfitting of modules.

Shops have been extended in size, platens expanded, craneways extended, and numerically-controlled manufacturing machinery added. One of the first robotic production welding centers in U.S. shipbuilding is also in full operation.

A full computer-aided engineering center is operational, providing numerical control for lofting and automated machinery for production, as well as design and production services. Production planning, purchasing, and material control systems are also computer assisted.

The most recent facility expansion project in this program is the addition of a land-level ship lift (Syncrolift) facility. The completed facility will include a shiplift platform 655 feet by 106 feet (200 m by 32 m) with a lifting capacity for vessels up to 48,000 dwt., a side-transfer system, and five work bays. Phase I of this project, which encompasses the shiplift, side-transfer system, and two work bays capable of handling up to five vessels simultaneously, first became operational in March 1984. Further expansion is to continue in an orderly phased program over the next five years until the total project is completed. According to Todd's management, Phase I of this facility doubles the Los Angeles Division's ship construction capacity and increases its repair capability by 250 percent.

Todd-LA operates two floating drydocks, the larger of which can handle a vessel up to 711 feet by 86 feet (217 m by 26 m). Berthing space in the yard totals 6,175 feet (1,882 m).

Two complete shoreside Navy crew living complexes are available to accommodate crew members while their ships are undergoing PSA, SRA, overhaul, or other repair work at the shipyard.

R&D in shipbuilding technology continues to be an important interest of the shipyard's management. Presently, the yard sponsors two SNAME/SPC technical panels: Outfit Planning (SP-2) and Flexible Automation (SP-10). Research under other SNAME/SPC panels is being conducted in other areas of robotics, waterborne coatings, shipbuilding standards, and outfitting aids. The Los Angeles Division has been established as the Todd corporate center for R&D and advanced shipbuilding technology development for which a Naval Technology Division was established in March 1984. An independent research and development program for other projects having special interest or impact on the corporation is also conducted at the shipyard.

Total employment at the yard was 2,700 in July 1985, down from 3,340 a year earlier.

Exhibit 30 is a plant map of the Los Angeles Division's facilities.

## 26. Todd Shipyards Corporation - San Francisco Division

Under the terms of a three-party agreement consummated on October 14, 1982, Bethlehem Steel Corporation sold this 40-acre San Francisco shipyard to the city and sold the yard's equipment,

including drydocks, to Todd Shipyards Corporation. The San Francisco Port Commission took title to the land, piers, and buildings; and Todd acquired a 30-year lease on this property.

This shipyard, which traces its beginning back to 1894, is one of the oldest yards in the United States. As one of the larger and more versatile repair yards in the country, it offers a complete range of ship repair and reconditioning services and can handle conversion and jumboizing work, as well as industrial work. It is also capable of constructing large oceangoing ships.

During World War I, as a subsidiary of Bethlehem Steel, this shipyard delivered destroyers at the rate of three a month. In the huge shipbuilding, repair, and conversion programs of World War II, the yard with the help of facilities leased from the Navy, built 72 ships including 52 Navy combat vessels. In addition, about 2,500 Navy and commercial vessels were repaired or converted at the yard during the World War II period.

In the 1950's, ship repairs, conversions, and special industrial work were followed by construction of two destroyer escorts, five C4 Mariner class cargo ships, a wine tanker, and four medium-size commercial oil tankers.

This San Francisco yard demonstrated its flexibility in the 1960's. Shipbuilding continued with the construction of four C4 cargo ships, two Navy destroyer escorts, and a number of oil and rail barges. An outstanding accomplishment was the fabrication of 57 sections of trans-bay underwater tube for the San Francisco Bay Area Rapid Transit (BART), the longest sunken-tube tunnel in the world.

In recent years, this shipyard's specialty has been barge design and construction. Other activities included ship conversion and general ship repair work. Business declined in 1982; and at the time of Bethlehem's sale of the yard to Todd Shipyards Corporation in October 1982, no major ship construction or repair work remained.

During 1983 and 1984, in addition to Navy work, the yard completed extensive modifications to passenger accommodations on a large cruise ship, construction of a graving dock for Mare Island Naval Shipyard, and construction of submarine propulsion shafts for General Dynamics-Electric Boat.

During the first three quarters of 1985, the yard was engaged primarily in ship repair, overhaul, and maintenance work for the Navy. Other work included drydocking and repair of various commercial vessels.

Todd's San Francisco shipyard operates one building way, a conventional end-launch type that can accommodate ships up to 550 feet by 96 feet (168 m by 29 m). The yard's larger floating drydock with a maximum vessel size of 950 feet by 144 feet (290 m by 44 m) has a lifting capacity of 65,000 long tons (66,040 metric tons). This drydock, designed by Bethlehem and built at the San Francisco yard, is capable of serving the largest tankers



that transport crude oil from Alaska to West Coast ports. Also available is a second floating drydock with a maximum vessel size of 700 feet by 94 feet (213 m by 29 m), and about 3,200 linear feet (975 m) of usable berthing space along four piers, all fully serviced with utilities and by cranes of up to 50 tons (45 metric tons) capacity.

At mid-1985, the yard's work force totaled 450, approximately the same as a year earlier.

Exhibit 31 is a current plot plan of Todd's San Francisco plant and facilities.

#### 27. Todd Pacific Shipyards Corporation - Seattle Division

Todd's Seattle Division is located at the northwest corner of Harbor Island in Elliot Bay, less than 10 minutes from downtown Seattle, WA. From 1898 until 1916, when the William H. Todd Company of New York bought the shipyard from the Seattle Construction and Drydock Company, a variety of vessels were produced, including the world's finest six-masted barkentine and (at that time) the world's fastest single-screw steamer.

This 42-acre yard has been a prime supplier of fighting ships for the Navy. During World War II, Todd operated three shipyards in the Seattle-Tacoma area, mainly turning out destroyers and aircraft carriers. More than 57,000 persons worked three shifts during the war years, constructing over 125 ships.

For several years after the war, Todd-Seattle was primarily a repair facility with employment dipping as low as 250 people. In the early 1950's, the yard embarked anew on vessel construction and industrial production, completing a formidable array of tugs, barges, dredges, pile drivers, floating cranes, etc. In 1958, the company re-entered destroyer construction and by 1964 had delivered four guided missile destroyers to the Navy. The Seattle Division then became lead yard for a class of 26 frigates, seven of which were built there. During this period, the yard also built the Navy's only catamaran oceanographic vessel.

From mid-1971 until early 1976, Todd-Seattle built the Washington State ferry system's two 200-car double-ended ferries, a surface effect ship for the U.S. Navy, seven tug-supply vessels designed for North Sea conditions, and several barges. Containership conversions were performed for American President Lines and Sea-Land.

In late 1976, the yard once again began combat ship construction with the first of a series of guided missile frigate (FFG) contracts. As of October 1, 1985, 13 FFG's had been delivered--the last in July 1985.

In August 1984, the yard completed the refitting for ABS classification and U.S. flag registry of two large German-built containerships, the ELBE EXPRESS and the ALSTER EXPRESS, for Lykes Brothers.

Todd-Seattle is currently building a new floating drydock for the Navy, with delivery scheduled for February 1986. Other work in the yard includes the modernization of eight Hamilton class Coast Guard cutters with the last scheduled for redelivery in March 1990, the overhaul of the USS HARRY W. HILL (DD-986) with redelivery scheduled for about June 1986, and the phased maintenance of two fast combat supportships, the USS SACRAMENTO and the CAMDEN (AOE's 1 and 2), with redelivery scheduled for approximately March 1986.

This yard has an active ship repair and overhaul operation that annually works on from 200 to 300 commercial and naval vessels. The Seattle Division has been appointed authorized repair and service representative for B&W/M.A.N. Diesel of Denmark and Sulzer Marine Diesels of Switzerland. In 1985, the yard received Navy certification for Master Ordinance Repair (M.O.R.) and the Department of Defense's Quality Excellence Award.

The FFG Program provided the impetus for a multimillion-dollar capital investment program for improving productivity of the Seattle yard in ship repair, overhaul, and conversion. In July 1982, the company transferred a 40,000 metric ton floating drydock from its San Francisco Division to Seattle. A new 150-ton (137 metric ton) traveling whirley crane on the adjacent 1,000-foot (305 m) concrete pier serves the floating drydock and the adjacent berths. A second pier was rebuilt in concrete and lengthened to give the yard a 1,000-foot (305 m) berth with a 40-foot (12.2 m) water depth. Other facility improvements include a new machine shop, a facility for pump and motor testing, special balancing equipment for rotors up to 15,000 pounds, a new valve shop, complete CAD/CAM capabilities, and a calibration facility.

The largest building way at Todd-Seattle can handle a ship up to 600 feet by 96 feet (183 m by 29 m). It can also be used as a dual launchway for simultaneous construction of two ships with beams of 50 feet (15 m) or less. A small side-launch building way was added in 1974. In addition to the 40,000 metric ton drydock, there are two other floating drydocks, the larger of which can accommodate ships up to 650 feet by 84 feet (198 m by 26 m).

Two wharves and five piers provide a total of 6,017 feet (1834 m) of berthing space for outfitting and repair. The yard is serviced by 12 whirley traveling cranes.

In July 1985, total employment at the Seattle plant was 975 down from 1,730 a year earlier.

Exhibit 32 is a current plot plan of Todd-Seattle's facilities.

28. The Toledo Shipyard

In January 1985, the Toledo-Lucas County Port Authority purchased this shipyard from The American Ship Building Company which owned the yard since 1947 and closed it in 1982. In September 1985, the yard was re-opened when Merce Industries, Inc., a 25-year old topside repair firm, entered into an agreement with the Port Authority to operate the shipyard for 25 years. The Toledo Shipyard is a complete, full-service shipyard, equipped for new construction, conversion, repair, and propeller repair.

Since Merce Industries, Inc., began operating the yard, they have made extensive repairs, and they have upgraded, and renovated the facility, including the leveling of the old fit-out building adjacent to one of the drydocks, which improved access to the pier area between the graving docks and the wet slip area. Merce Industries elected not to lease the buildings immediately adjacent to the yard as the firm had existing facilities that were superior and in the nearby area. These existing facilities include a 50,000 sq. ft. (4645 m<sup>2</sup>) fabricating/propeller repair facility and a 12,000 sq. ft. (1115 m<sup>2</sup>) machining and pressure vessel shop.

Complete facilities for propeller repair services in all alloys is available through the American Propeller Division. The company also operates several repair vessels for the accomplishment of repairs at sites away from the shipyard.

The company maintains two graving docks. One can accommodate vessels up to 680 feet by 78 feet (207 m by 24 m), and the other, vessels as large as 540 feet by 68 feet (165 m by 21 m). Usable berthing space totals about 1,600 feet (488 m).

Merce Industries is currently constructing a 360-foot wide by 60-foot deep (110 m by 18 m) notch barge for St. Marys Holdings, Inc. The barge is an ocean-going, ice-strengthened vessel with a totally self-contained pneumatic unloading system.

As of October 1985, employment at Merce Industries totaled 150.

Exhibit 33 is a current lay-out of The Toledo Shipyard operated by Merce Industries, Inc.

29. Triple A Shipyards, Division of Triple A Machine Shop, Inc.

Triple A Machine Shop was in business in San Francisco, CA, from 1945 to 1976 as a ship repair facility engaging in overhaul and topside work on Navy and commercial vessels.

In 1976, the company leased the shipbuilding and ship repair facilities at the Hunters Point Naval Shipyard which had been closed and idle for almost two years. Triple A, since leasing the Hunters Point facility, has become a full-service

repair yard, engaging in Navy and commercial ship repair, overhaul, and conversion work. An average of about 30 ships a year have been drydocked.

The workload at Hunters Point during the first three quarters of 1985 was at an average volume equal to that of 1984. During the first quarter of 1985, the yard began modifications and repairs to the SS INDEPENDENCE and began work on two contracts for repairs aboard the USS ENTERPRISE (CVN 65). After the first quarter, the workload declined. Since that time, a series of commercial, U.S. Navy, MSC, and MARAD projects have kept the workload relatively steady but low.

The sprawling Hunters Point yard has a multi-drydock capability that is highlighted by the largest private graving dock on the West Coast. This dock can accommodate ships as large as 1,092 feet by 140 feet (333 m by 43 m), and there are five other graving docks available. Additionally, the large land area, office buildings, numerous fully-equipped shop buildings, warehouses, and other special purpose buildings provide Triple A with a capability exceeding that of any other private West Coast ship repair yard.

With regard to crane service, the alongside weight-handling facilities at Hunters Point have the largest capacity and are the most versatile within the Bay Area ship repair community. With pier space totaling about 24,000 linear feet (7315 m), the Triple A yard has the largest deep-water berthing complex of any West Coast shipyard.

As of July 1, 1985, employment at the yard totaled 480; but the labor force fluctuates depending upon available repair work.

Exhibit 34 is a current yard plan outlining the Triple A facilities at Hunters Point.

#### Employment

Total employment trends over the past seven years in privately owned U.S. shipbuilding and ship repair yards (Bureau of Labor Statistics-SIC 3731-figures) are illustrated in the following table:

1979 Average	173,300
1980 Average	178,000
1981 Average	186,700
1982 Average	171,600
1983 Average	147,300
1984 Average	155,900
1985 January	156,100
1985 February	159,200
1985 March	150,400
1985 April	149,200
1985 May	147,000
1985 June	144,900
1985 July	138,500
1985 August	138,600
1985 September (Prelim.)	139,800

The Bureau of Labor Statistics (BLS) conducts a random sampling of employment in SIC 3731 (shipbuilding and ship repair) industry establishments. From this sample, employment data extrapolations are made and published monthly. It should be noted that the 1985 projections are preliminary and may be subject to extensive revision by BLS.

The Maritime Administration monitors employment in the 24 major U.S. privately-owned shipyards in the Active Shipbuilding Base (as identified in Exhibit 37 of this report) on a monthly basis. As of September 1985, employment in these 24 yards totaled 103,133 or approximately 69 percent of the preliminary overall shipbuilding and repair industry employment published for that date by the Bureau of Labor Statistics.

### Ship Repair Facilities

While over 200 privately owned firms of varying capabilities are involved in repairing ships in the United States, only 60 yards are capable of drydocking vessels 400 feet in length and over. For ships this size, the U.S. shipbuilding and repair industry is currently operating a total of 61 floating drydocks, 44 graving docks, and several marine railways. However, some of these graving docks are committed to new construction. The large organizations which have drydocks generally have extensive waterfront acreage and are capable of all types of ship repair and maintenance. Major shipyards usually combine repair, overhaul, and conversion with shipbuilding capabilities, and employment usually numbers in the thousands. It is difficult to draw a sharp line between shipbuilding yards and ship repair yards, as many of the two engage in both types of work.

Since the downtrend in orders for new merchant vessels, several shipyards have in recent years expanded or upgraded ship repair, overhaul, and conversion facilities to improve their efficiency and competitive posture. Examples of recent, current, and planned plant expansion and modernization programs are:

- o Newport News Shipbuilding

In July 1983, Newport News announced plans to build a new submarine construction and repair complex which will be completed in 1987. This project will involve four new building ways, a major new construction facility under cover, a 900 metric ton crane, and the addition of a new 600 foot (183 m) floating drydock.

- o Norfolk Shipbuilding and Dry Dock Corporation

A recent addition was the floating drydock which was purchased from Verolme Botlek of the Netherlands. Built in 1960, the drydock can accommodate vessels up to 670 feet by 123 feet (204 m by 38 m), has a lifting capacity of 20,000 long tons (20334 metric tons). This drydock became operational in August 1985 and replaced an older wooden drydock.

o Bath Iron Works

BIW in December 1983 placed in operation a new conversion, overhaul, and repair facility in Portland, ME. The centerpiece of this fully-equipped, self-contained shipyard is an 81,000 long ton (82296 metric ton) lift capacity floating drydock, 844 feet (257 m) in length with a 140-foot (43 m) clear docking width.

o Todd Shipyards Corporation

The most recent facility expansion project is at Todd's Los Angeles Division. It consists of a land-level shiplift (Syncrolift) ship repair and construction facility. The completed facility will include a shiplift platform 655 feet by 106 feet (200 m by 32 m) having a lifting capacity for vessels up to 48,000 dwt., a side transfer system, and five work bays. Phase I of this project, which encompasses the shiplift, side transfer system, and two work bays, became operational in March 1984. Further expansion is to continue in an orderly phased program over the next four years until the total project is completed. According to Todd's management, Phase I of this facility doubles the Los Angeles Division's ship construction capacity and increases its ship repair capability by 250 percent.

o Tampa Shipyards, Inc.

As part of the yard's current facilities expansion program, two additional graving docks went into service in the third quarter of 1984, along with a new concrete pier, two wet berths, and additional shops and cranes. Each of these two new graving docks can accommodate vessels up to about 740 feet (225 m) in length, and the wet berths can handle ships up to 900 feet (274 m) in length.

o Continental Maritime of San Francisco, Inc.

In early 1985, this San Francisco topside repair yard, formerly SFW Corporation, placed in operation a new 26,000-ton (26416 metric ton) lifting capacity floating drydock to greatly increase the company's repair, overhaul, and conversion capability. The drydock was built in West Germany.

o National Steel and Shipbuilding Company

In late 1983, NASSCO placed in operation a new 25,000-ton (2540 metric ton) floating drydock, which will enable the yard to respond more fully to both Navy and commercial ship repair markets. This drydock was built in Japan.

o Southwest Marine, Inc.

As part of a multimillion-dollar modernization program at its San Diego, CA, shipyard, Southwest Marine in late 1984 put into service a 22,000 metric-ton lift capacity floating drydock built by Kawasaki Heavy Industries of Japan. This new high-tech computer-operated drydock includes many innovative design features. According to company management, the planned addition of two shore platforms and other support equipment to be used in conjunction with this unique end-transfer drydock will provide the capability to transfer ships up to 600 feet (183 m) in length onto the two platforms for dry berthing. Using this concept, three large ships can be repaired simultaneously out-of-water -- one on each platform and one in the new floating drydock. Also, a 700-foot by 60-foot (213 m by 18 m) pier and a 65-ton (59 metric ton) gantry crane have been added to the facility.

o Bethlehem Steel Corporation

Bethlehem Steel Corporation in the summer of 1985, placed in operation one of the country's largest drydocks at its new Sabine Yard in Port Arthur, TX. The eight-section Navy surplus facility is leased from the Port of Port Arthur and will be used primarily for repair and inspection of offshore drilling rigs, although it can accommodate vessels up to 1,100 feet (335 m) in length. For rigs, the dock's sections can be arranged to provide a clear docking area of 362 feet by 414 feet (110 m by 126 m).

A \$1.1 million construction project at its Sparrows Point yard commenced in 1985. The project involves the installation of a two-position intermediate gate to increase the flexibility of its 1,200 foot (366 m) building basin by dividing it into two sections. In one position, the basin's sections will be 300 feet and 900 feet (91 m and 274 m) in length. In the second position, the sections will be 685 feet and 515 feet (209 m by 157 m) in length.

o Rodermond Industries, Inc.

This company purchased and re-opened in 1985 the former Todd Shipyard Corporation's, Erie Basin shipyard in Brooklyn, NY. Rodermond Industries plans to add three floating drydocks to the facility in addition to reconditioning the existing buildings. One of the additional drydocks became operational in late 1985 and is capable of accommodating a ship up to 600 feet (183 m) in length. Another 400 foot (122 m) long dock is expected to be operational in the near future.

## o The Toledo Shipyard

Purchased and re-opened in September 1985 by the Toledo-Lucas County Port Authority. This former American Ship Building Company shipyard is operated under a long-term lease by Merce Industries. Since September 1985, extensive repair, upgrading, and renovation have occurred at the facility.

Ship repair is considered within the industry as generally more profitable than ship construction, and it is also seen as a means to maintain a skilled labor force. The repair yard often commands excellent prices for urgently needed repairs and can control its overhead closely. Ship repair yards over the last few years have also been actively soliciting non-ship industrial work requiring skills such as steel fabrication, welding, boiler repairs, and engine overhauls, typical in ship repair.

Repair of naval ships has become a matter of vital importance requiring the highest skill and dedication; and as the complexity and sophistication of warships grows, so must the capabilities of U.S. repair yards. This country's privately owned ship repair industry is an essential national resource in the planning and execution of the maintenance and upkeep of these complex naval ships. Private U.S. shipyards are continuing to receive at least 30 percent of the funds available each year for repairs, overhaul, and conversion of Navy vessels. Projected ship alteration and repair programs essential to maintain these ships at a high level of material readiness are expected to result in a nominal future workload increase for both naval and private shipyards. However, the large size and complexity of Navy combatant ships naturally restricts participation in this type of Navy work to a limited number of private yards.

The commercial ship repair market continued to be generally weak during 1985, and future prospects are uncertain. Navy repair and overhaul work continued to be a consistent and stable element in the repair industry's endeavors. Competition for all repair contracts has been intense.

Although several firms in the industry are readying their yards for greater future participation in the Navy repair and overhaul market, private ship repair capacity in many areas of the Nation continues to be underutilized.

### Repair (with Drydocking) Facilities

Major drydocking facilities are defined in this report as those yards having at least one drydocking facility that can accommodate vessels 400 feet (122 m) in length and over, provided that water depth in the channel to the shipyard itself is at least 12 feet. These facilities may also be capable of constructing a vessel smaller than 475 feet by 68 feet (145 m by 21 m), and/or have drydocks for vessels smaller than 400 feet (122 m) in length.



Appendix B tabulates information updated through 1985 on 31 of these repair yards by coast. Additional information is available in the Office of Shipbuilding Costs and Production.

### Major Topside Repair Facilities

Major topside repair facilities are those that have sufficient berth/pier space for topside repair of ships 400 feet (122 m) in length and over, provided that water depth in the channel to the facility itself is at least 12 feet. These facilities may also have drydocks for vessels smaller than 400 feet (122 m) in length and/or be capable of constructing a vessel smaller than 475 feet by 68 feet (145 m by 21 m). Services rendered by these firms vary from a simple repair job to a major topside overhaul, particularly when the work on oceangoing ships can be accomplished without taking the ships out of the water. It is common practice for a shipyard to send its personnel and equipment to provide voyage repairs while the ship is at anchor or working cargo at a commercial marine terminal. There is an increasing trend worldwide to send ship repairers to the ship rather than to bring the ship to the shipyard, thus calling for greater mobility of ship repair personnel. This trend creates a particular demand for highly skilled technicians versus the hull trades.

Appendix B also tabulates information through 1985 on the 28 topside repair yards' facilities (berth/pier space). The yards' building ways, drydocks, marine railways, etc., are not addressed herein as they cannot accommodate vessels 400 feet (122 m) in length and over. However, detailed data for these facilities has been obtained during the MARAD annual shipyard survey and is available in the Office of Shipbuilding Costs and Production.

### Active Shipbuilding Base

The Active Shipbuilding Base, as identified by the Navy and MARAD is comprised of 24 privately owned U.S. shipyards which are open and currently engaged in or seeking contracts for the construction of major oceangoing or Great Lakes ships 1000 gross tons or over. Exhibit 37 of this report identifies and geographically locates these 24 yards.

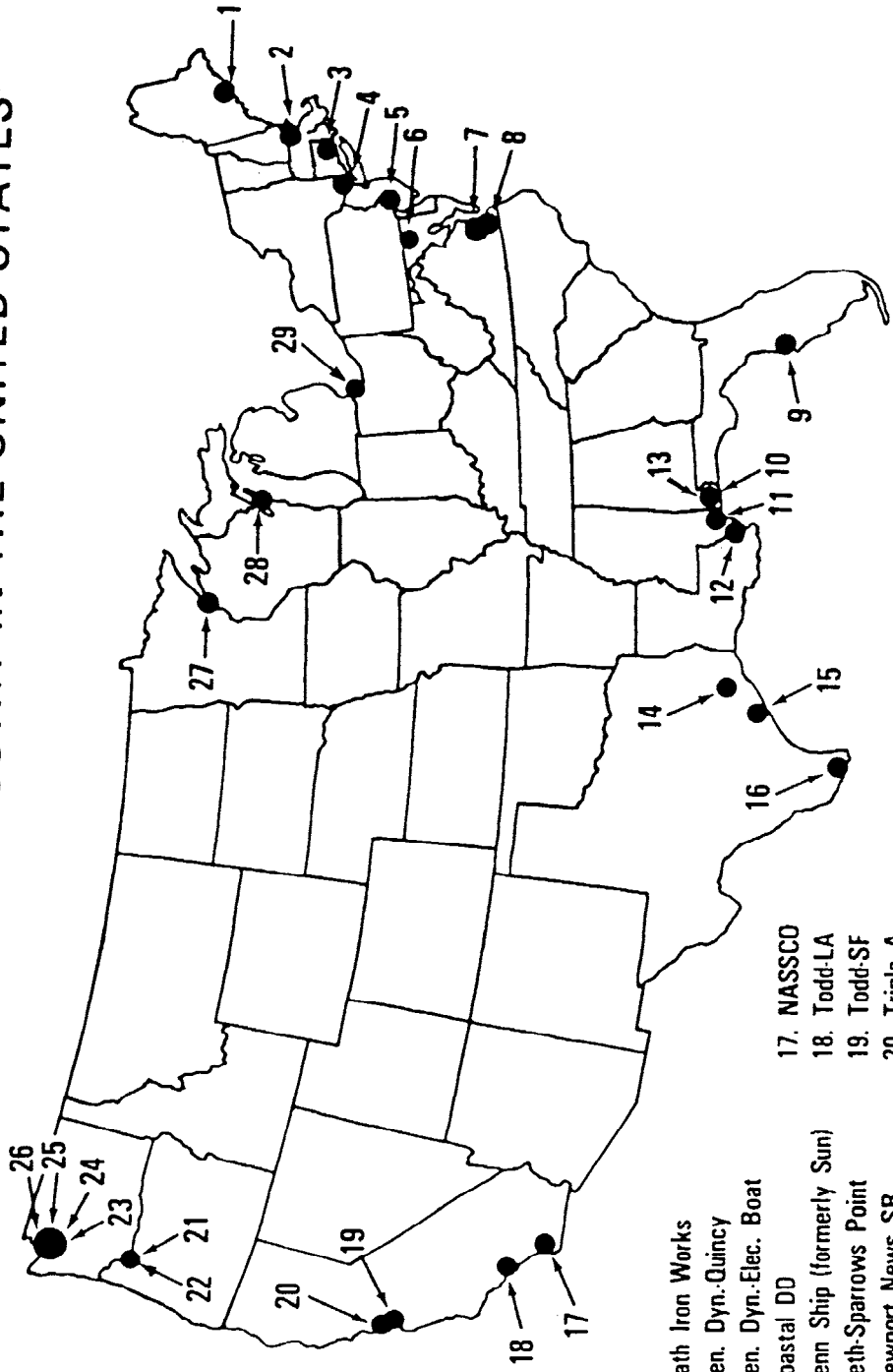
During 1985, the number of yards in the Active Shipbuilding Base was increased from 23 to 24 as a result of the re-opening of The American Ship Building Company's yard in Toledo, Ohio, by the Toledo/Lucas County Port Authority, under a new name, The Toledo Shipyard. At end-September 1985, these 24 yards employed roughly 69 percent of the U.S. shipbuilding and repair industry's total work force, as reported by the Bureau of Labor Statistics under SIC 3731. At that same time, 90 percent of the production workers in these 24 shipyards were engaged in Navy or Coast Guard ship construction and repair work.

As of December 1985, nine of the 24 shipyards were engaged in construction and/or conversion of major combat ships for the Navy. Five of the yards were building a total of 10 major commercial vessels, and seven of the yards were engaged primarily in ship construction and conversion work provided by the Navy's T-Ship program. Three of the yards had only repair and overhaul work and non-ship construction work.

Employment projections for production workers is shown by Exhibit 38 of this report. This data is generated by overlaying Navy projected five-year shipbuilding and conversion programs onto the estimated work force required to complete the current firm orderbook.

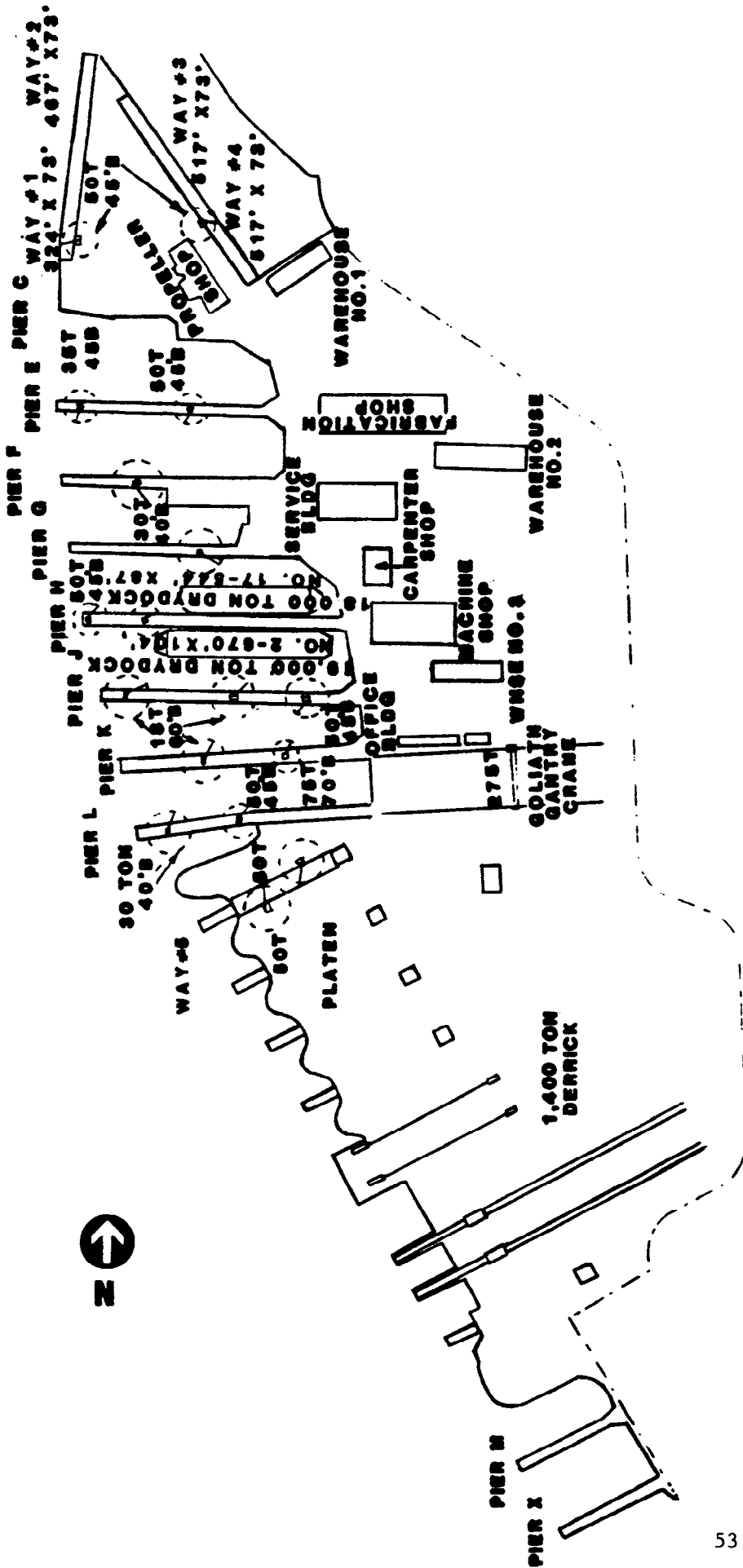
Exhibit 38, dated October 1, 1985, indicates a likely continuing decline during 1986 in production work force levels of the shipyards in the Active Shipbuilding Base, followed by a period of relatively stable work force requirements prior to a partial recovery expected to commence in late-1987. These projections are contingent upon near-term economic conditions and future Administration and Congressional action with regard to continuation of the proposed Navy shipbuilding and conversion programs.

# SHIPBUILDING INDUSTRY IN THE UNITED STATES



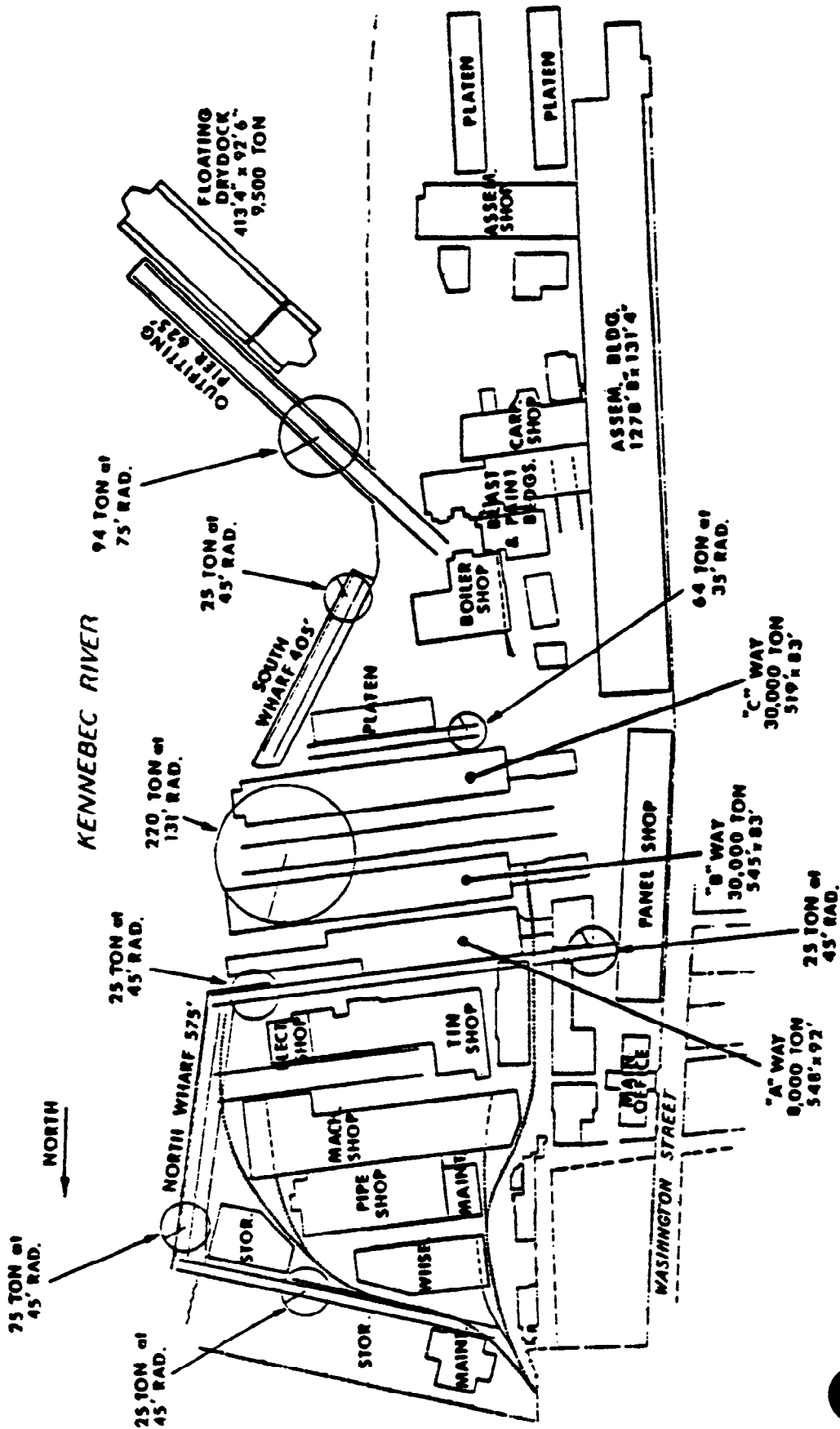
- |                             |                           |
|-----------------------------|---------------------------|
| 1. Bath Iron Works          | 17. NAASCO                |
| 2. Gen. Dyn.-Quincy         | 18. Todd-LA               |
| 3. Gen. Dyn.-Elec. Boat     | 19. Todd-SF               |
| 4. Coastal DD               | 20. Triple A              |
| 5. Penn Ship (formerly Sun) | 21. Gunderson, Inc.       |
| 6. Beth-Sparrows Point      | 22. Portland-SRY          |
| 7. Newport News SB          | 23. Tacoma Boat           |
| 8. Norfolk SB & DD          | 24. Lockheed              |
| 9. Tampa Shipyards          | 25. Marine Power & Equip. |
| 10. ADDSCO Industries       | 26. Todd-Seattle          |
| 11. Ingalls/Litton          | 27. Fraser Shipyards      |
| 12. Avondale Shipyards      | 28. Bay Shipbuilding      |
| 13. Halter Marine-Chickasaw | 29. Toledo Shipyard       |
| 14. Beth-Beaumont           |                           |
| 15. Todd-Galveston          |                           |
| 16. Marathon LeTourneau     |                           |

MAJOR U.S. SHIPBUILDING FACILITIES  
BUILDING CAPACITY—SHIPS 475 FEET IN LENGTH OR OVER



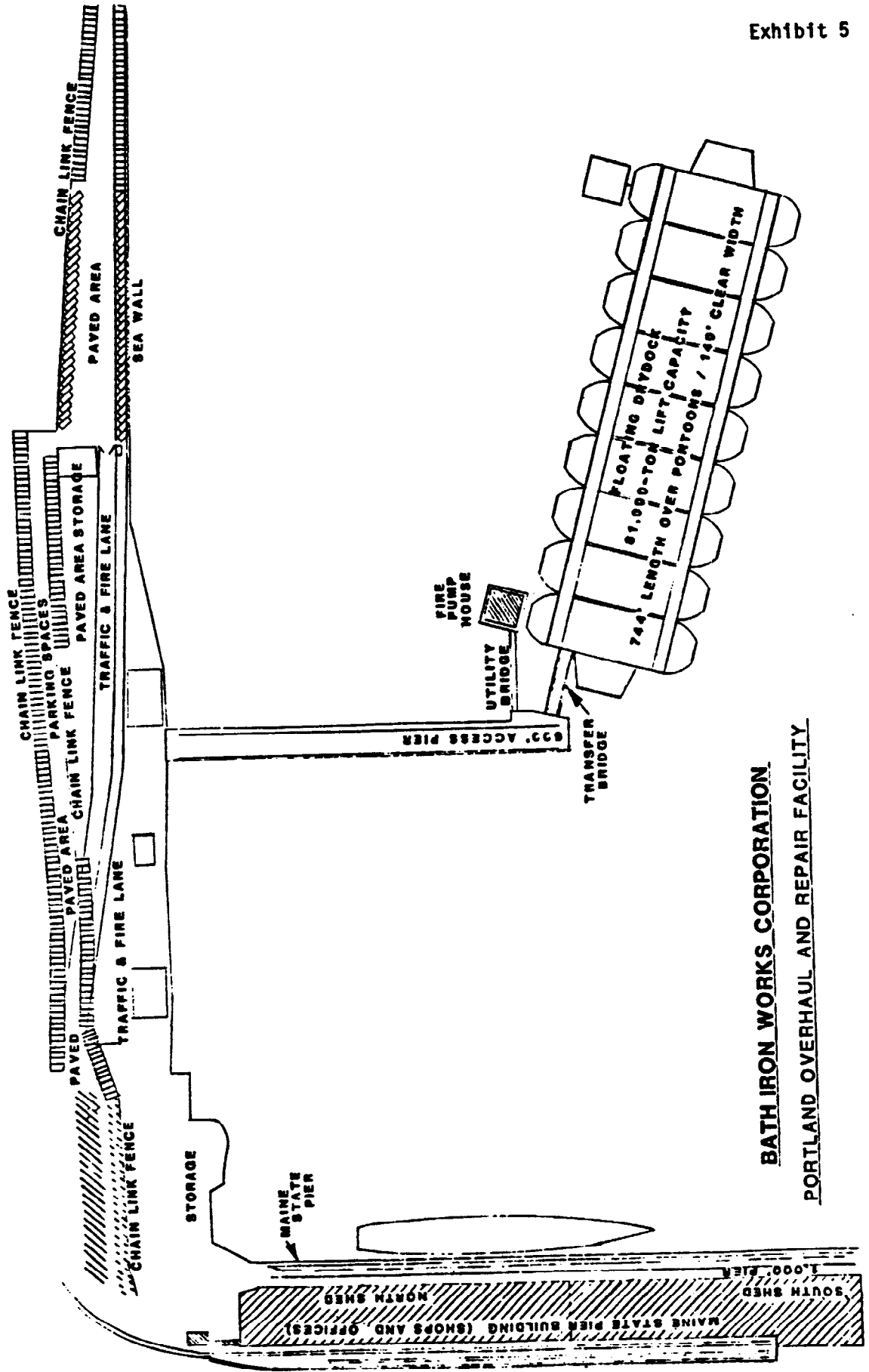
**ADDSCO INDUSTRIES, INC.**



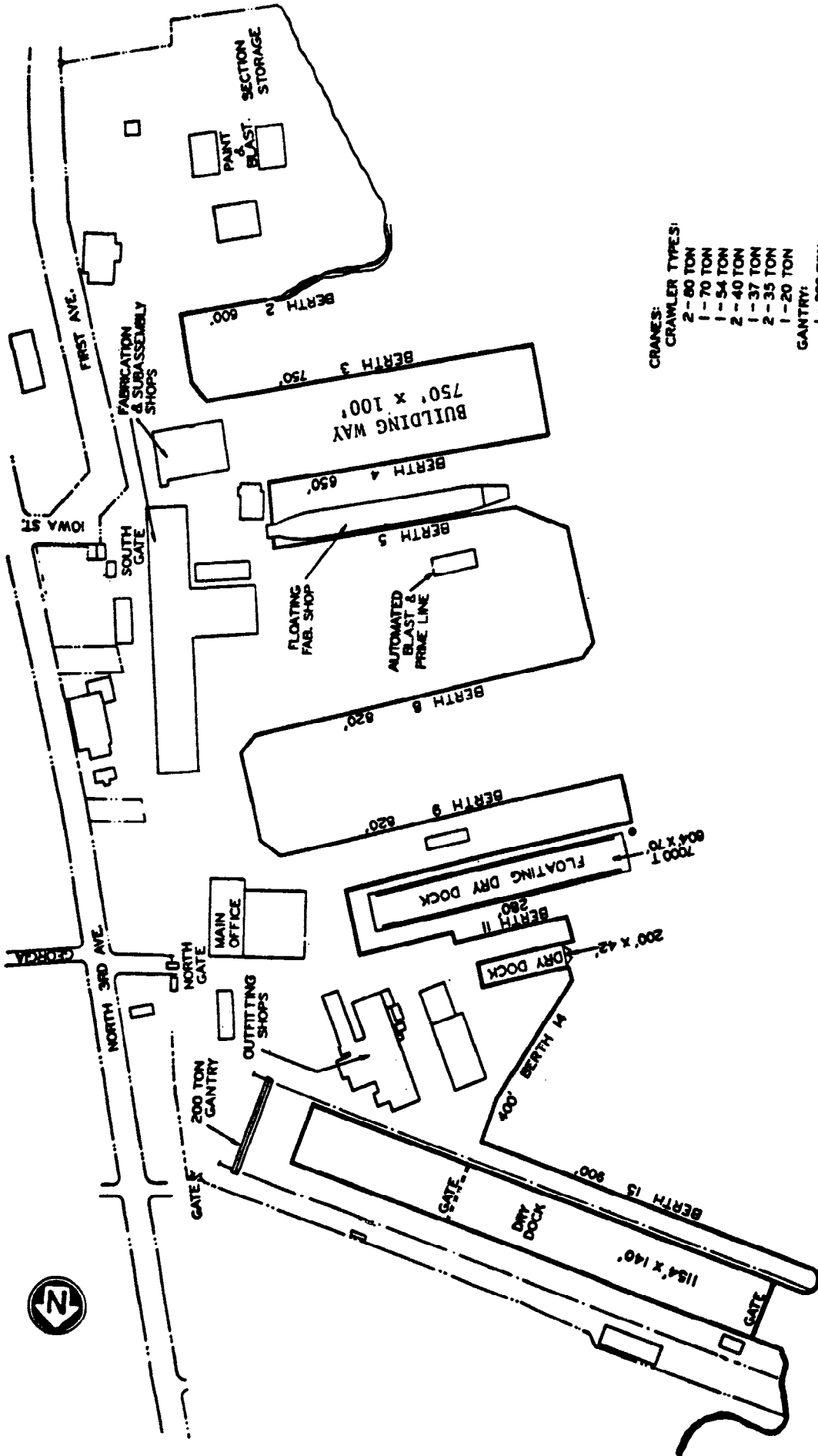


# BATH IRON WORKS CORP.





**BATH IRON WORKS CORPORATION**  
**PORTLAND OVERHAUL AND REPAIR FACILITY**

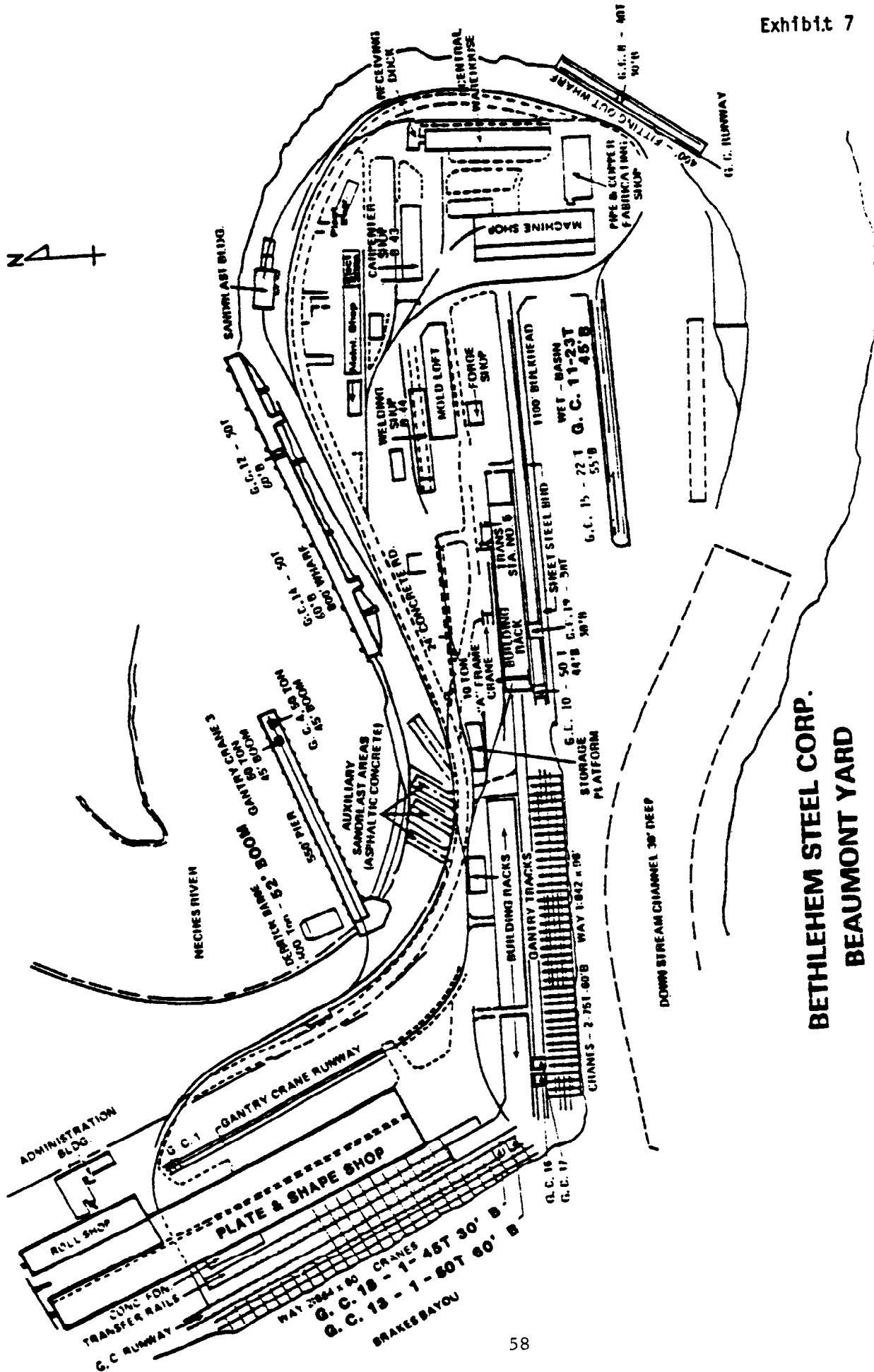


- CRANES:  
 CRAWLER TYPES:  
 2 - 80 TON  
 1 - 70 TON  
 1 - 54 TON  
 2 - 40 TON  
 1 - 37 TON  
 2 - 35 TON  
 1 - 20 TON  
 GANTRY:  
 1 - 200 TON

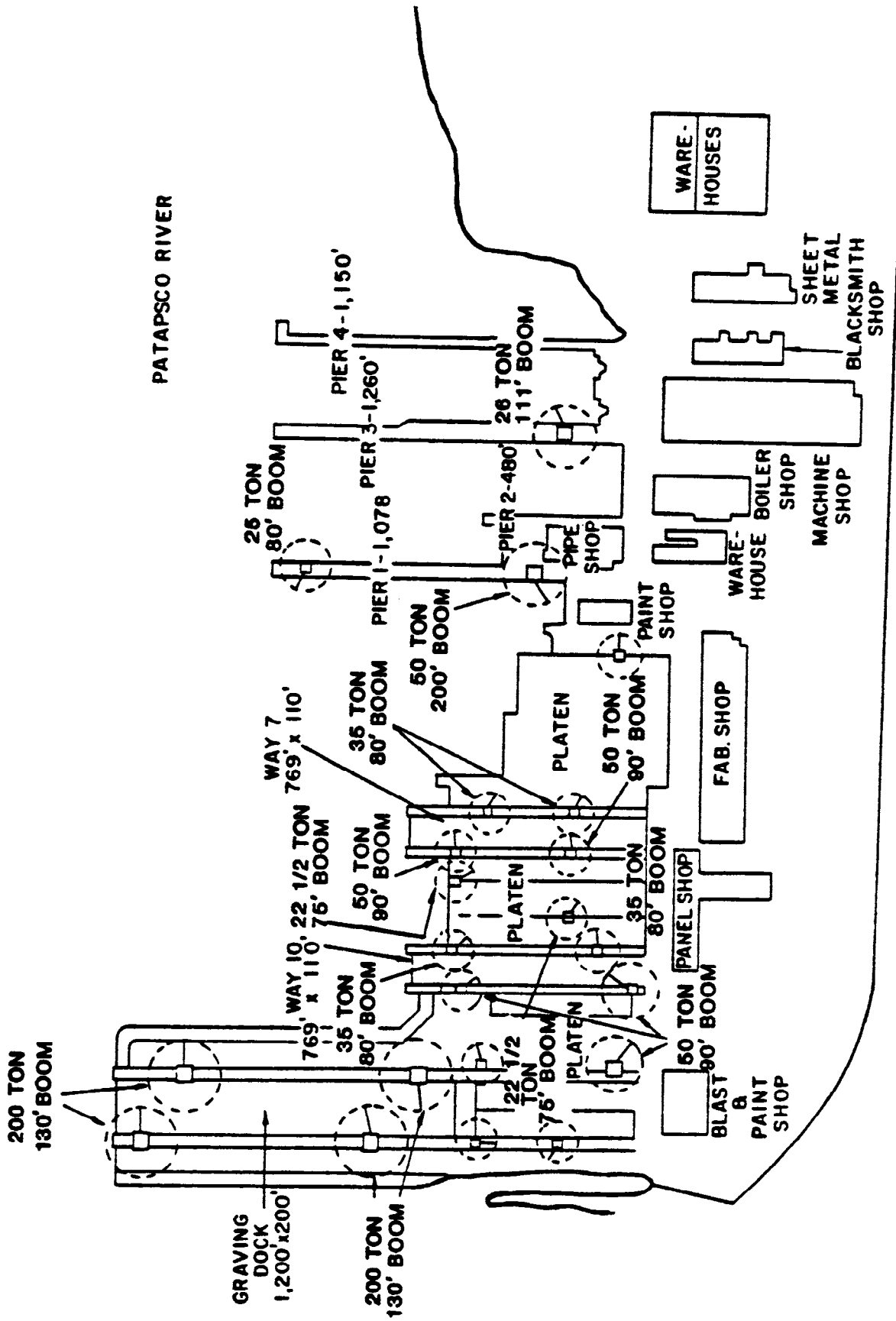
**BAY SHIPBUILDING CORPORATION**





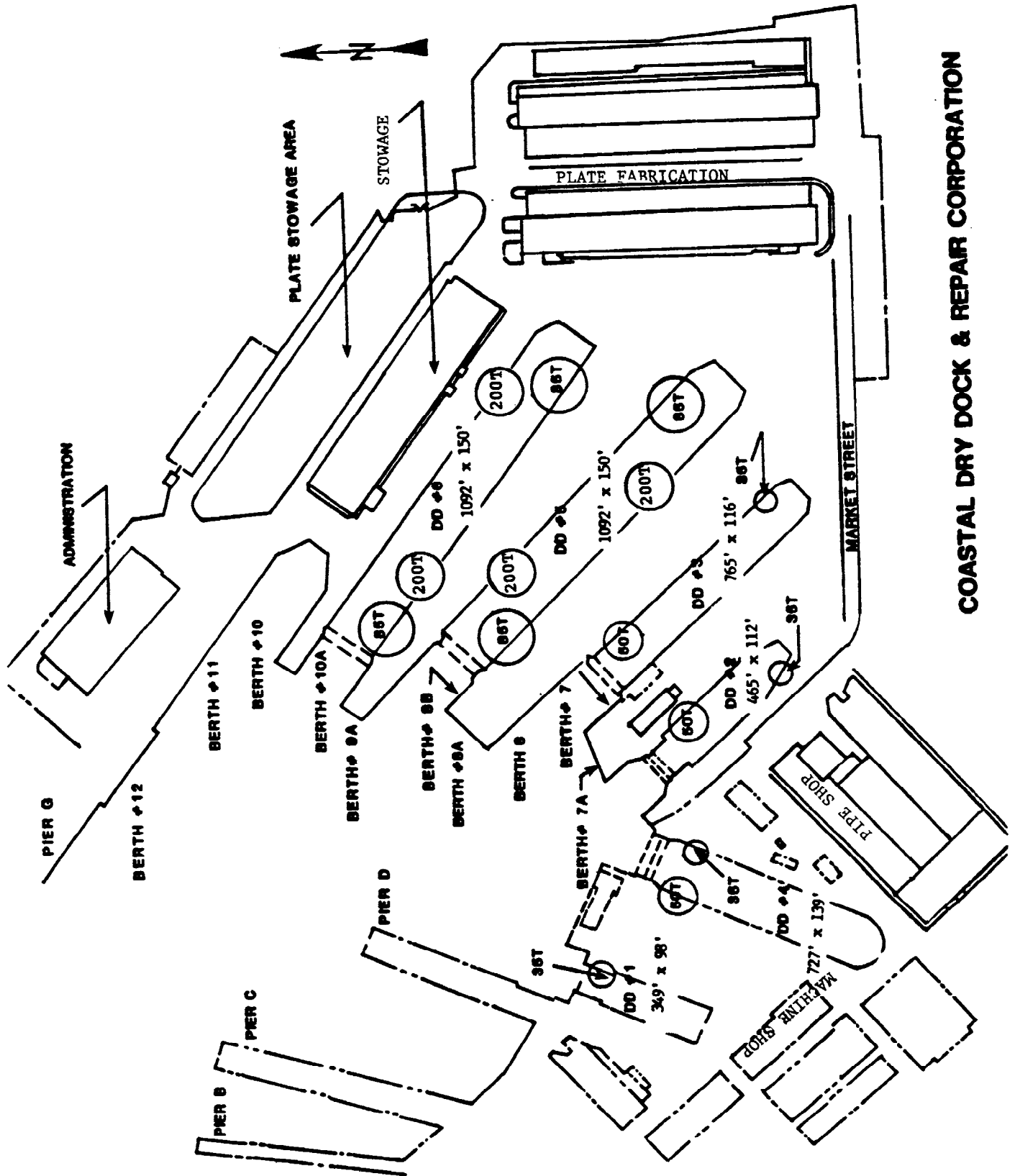


**BETHLEHEM STEEL CORP.  
BEAUMONT YARD**

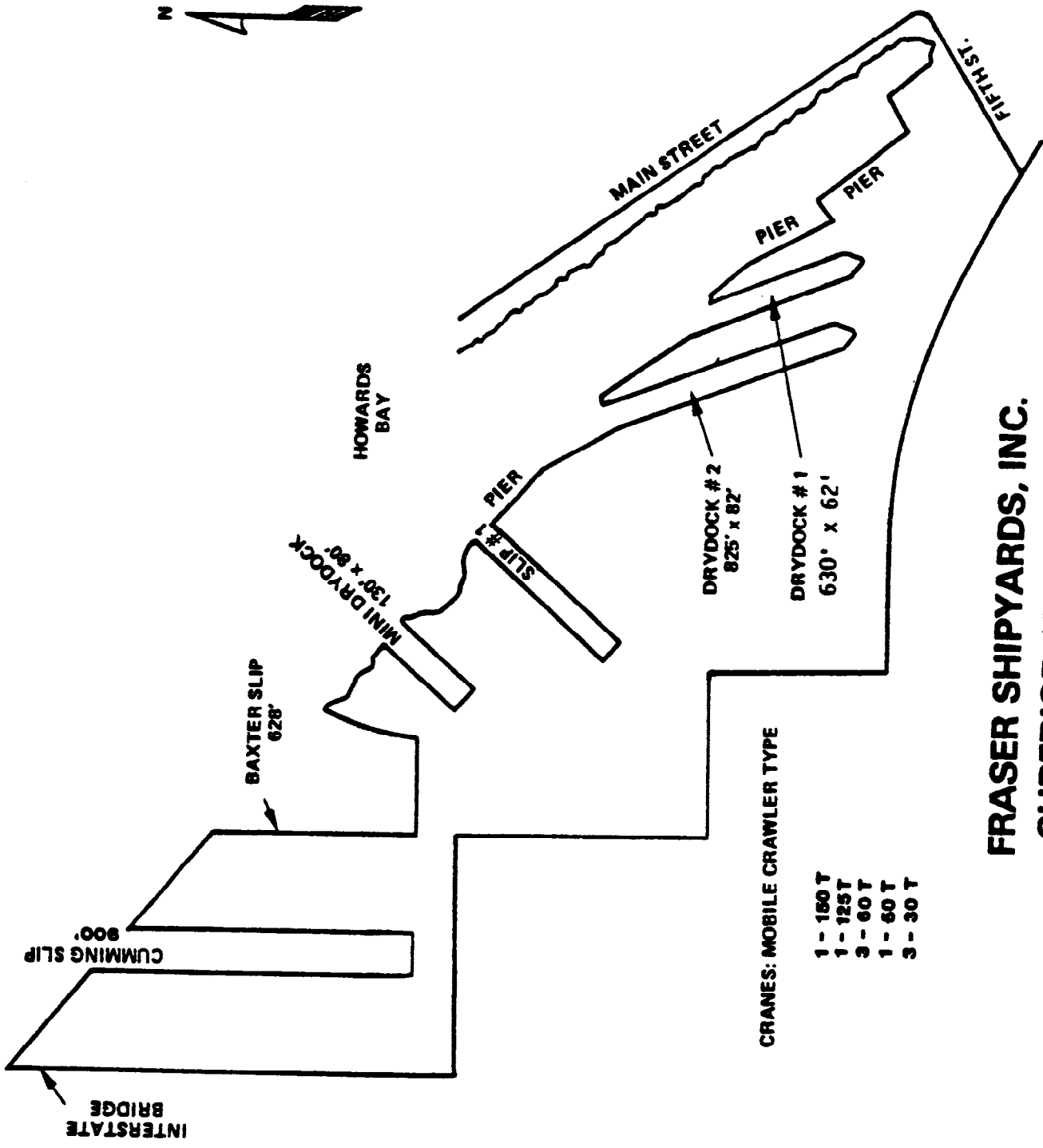


# BETHLEHEM STEEL CORPORATION

SPARROWS POINT YARD



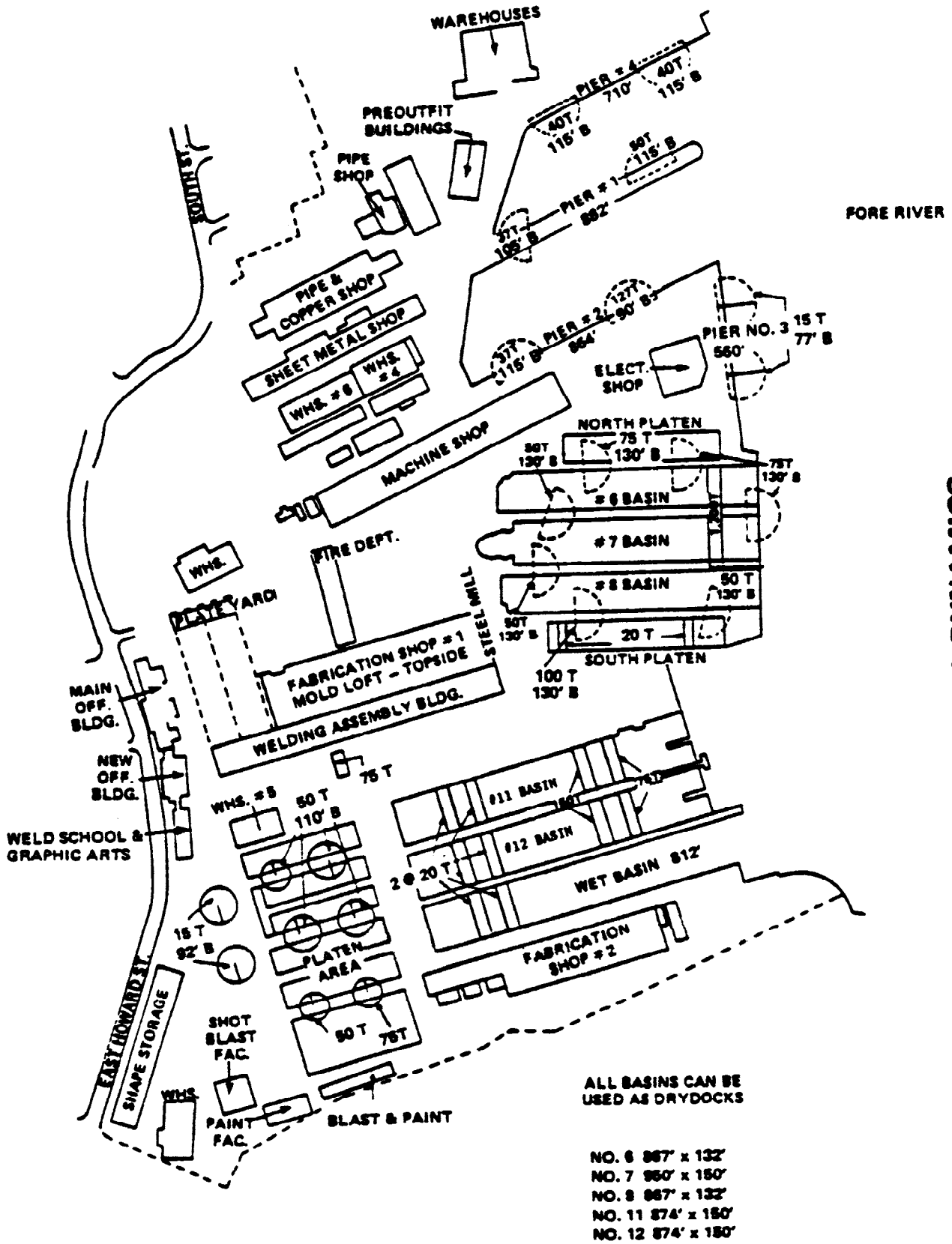
COASTAL DRY DOCK & REPAIR CORPORATION



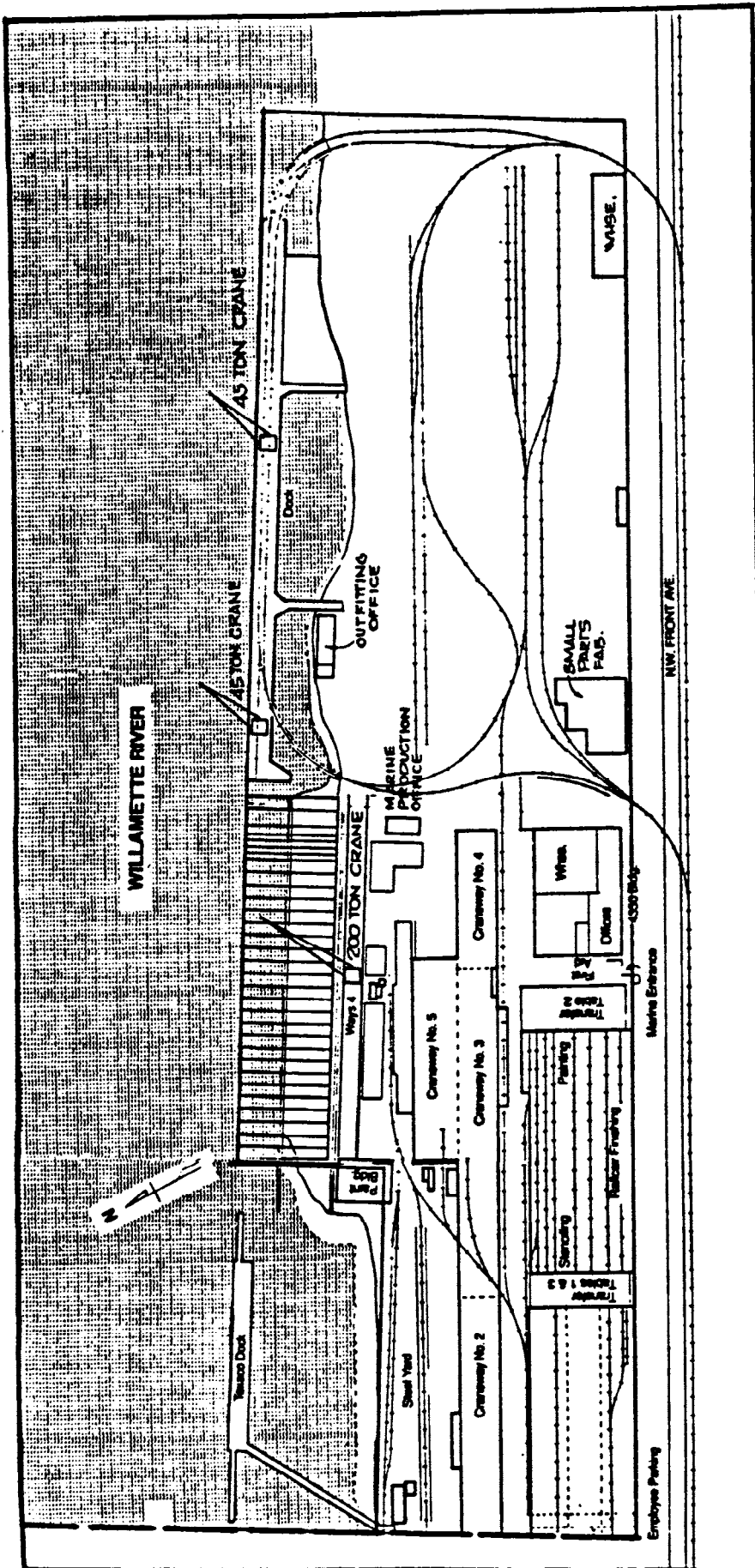
**FRASER SHIPYARDS, INC.  
SUPERIOR, WISCONSIN**

CRANES: MOBILE CRAWLER TYPE

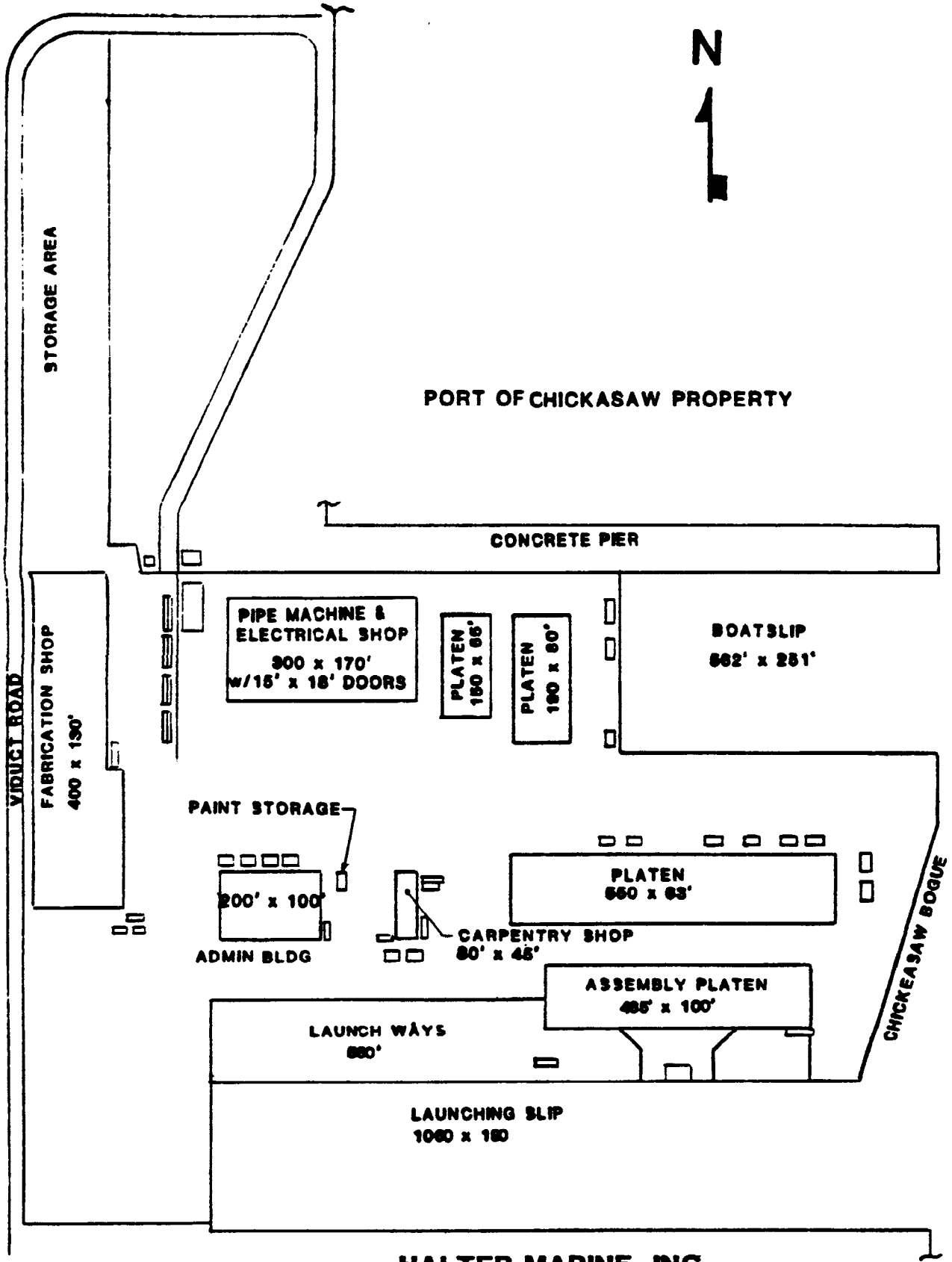
- 1 - 150 T
- 1 - 125 T
- 3 - 60 T
- 1 - 60 T
- 3 - 30 T



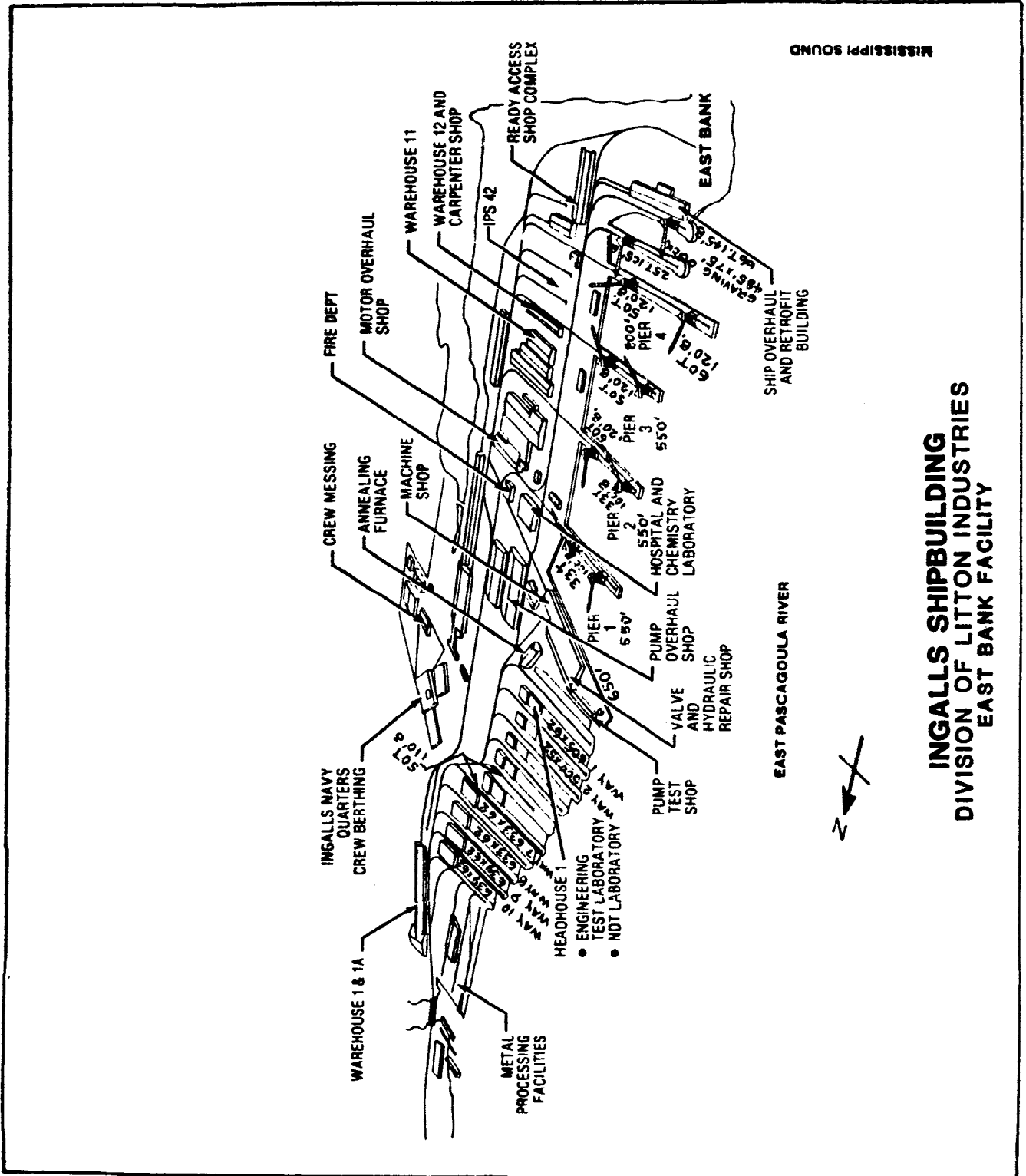
GENERAL DYNAMICS  
QUINCY SHIPBUILDING DIVISION



GUNDERSON INC.  
 Portland, Oregon



**HALTER MARINE, INC.  
CHICKASAW DIVISION**



**INGALLS SHIPBUILDING  
DIVISION OF LITTON INDUSTRIES  
EAST BANK FACILITY**

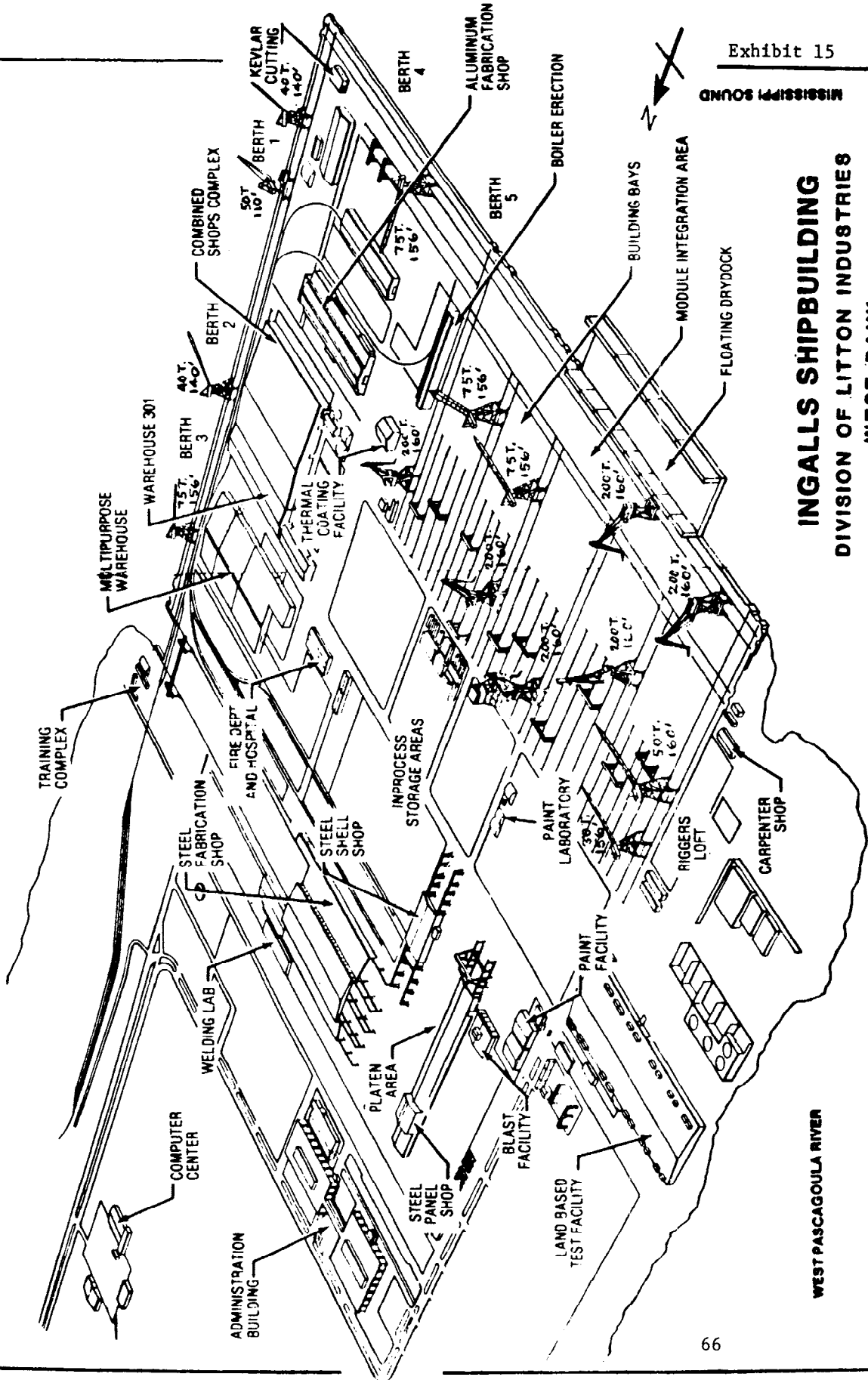


MISSISSIPPI SOUND

# INGALLS SHIPBUILDING DIVISION OF LITTON INDUSTRIES WEST BANK

EAST PASCAGOULA RIVER

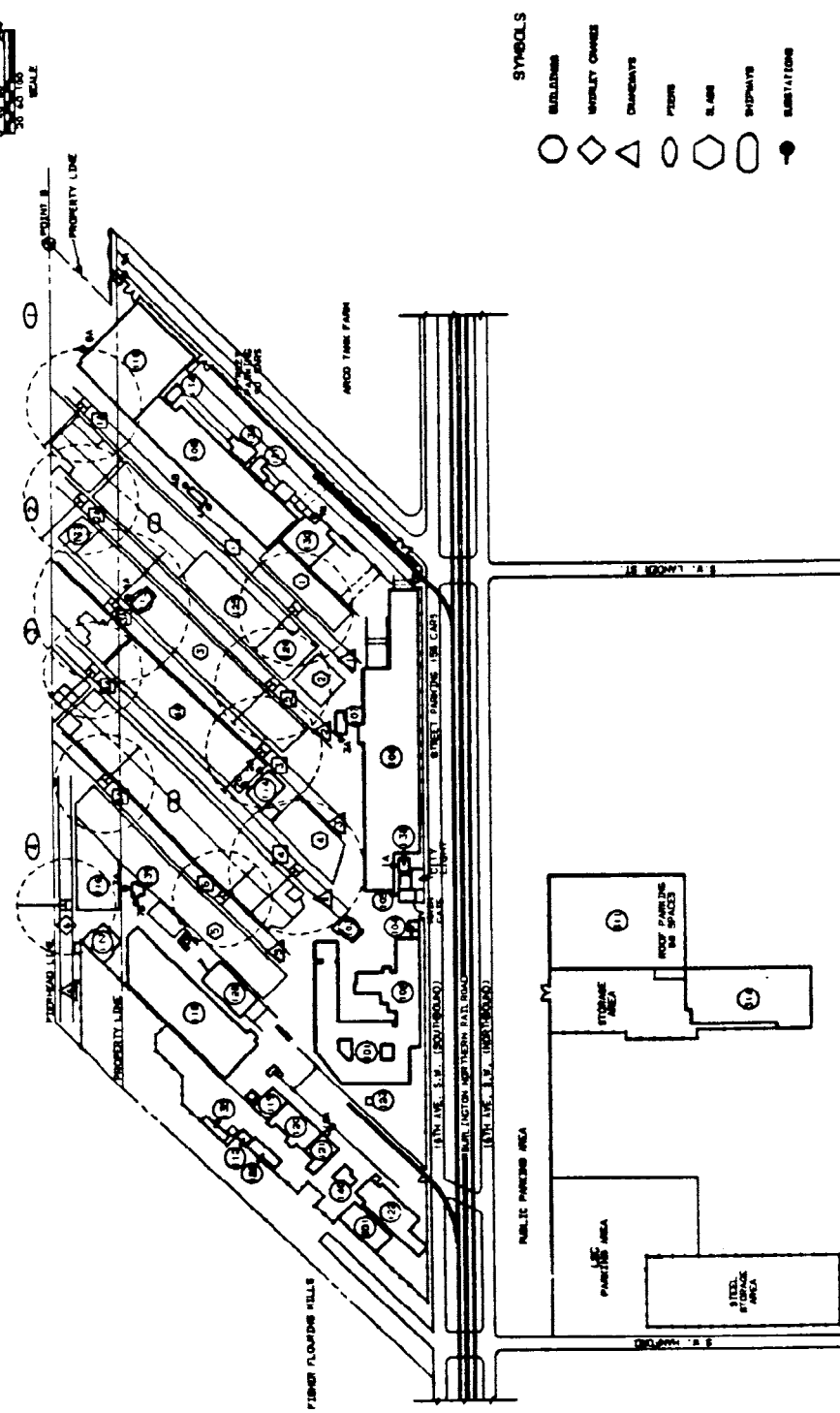
WEST PASCAGOULA RIVER



LAST FILE - BALLU - USER - 3220A - DRAWID - A-280 - 011  
 DATE - 4/24/84 TIME - 08.33 SCALE - 0.4822

PLANT FACILITIES

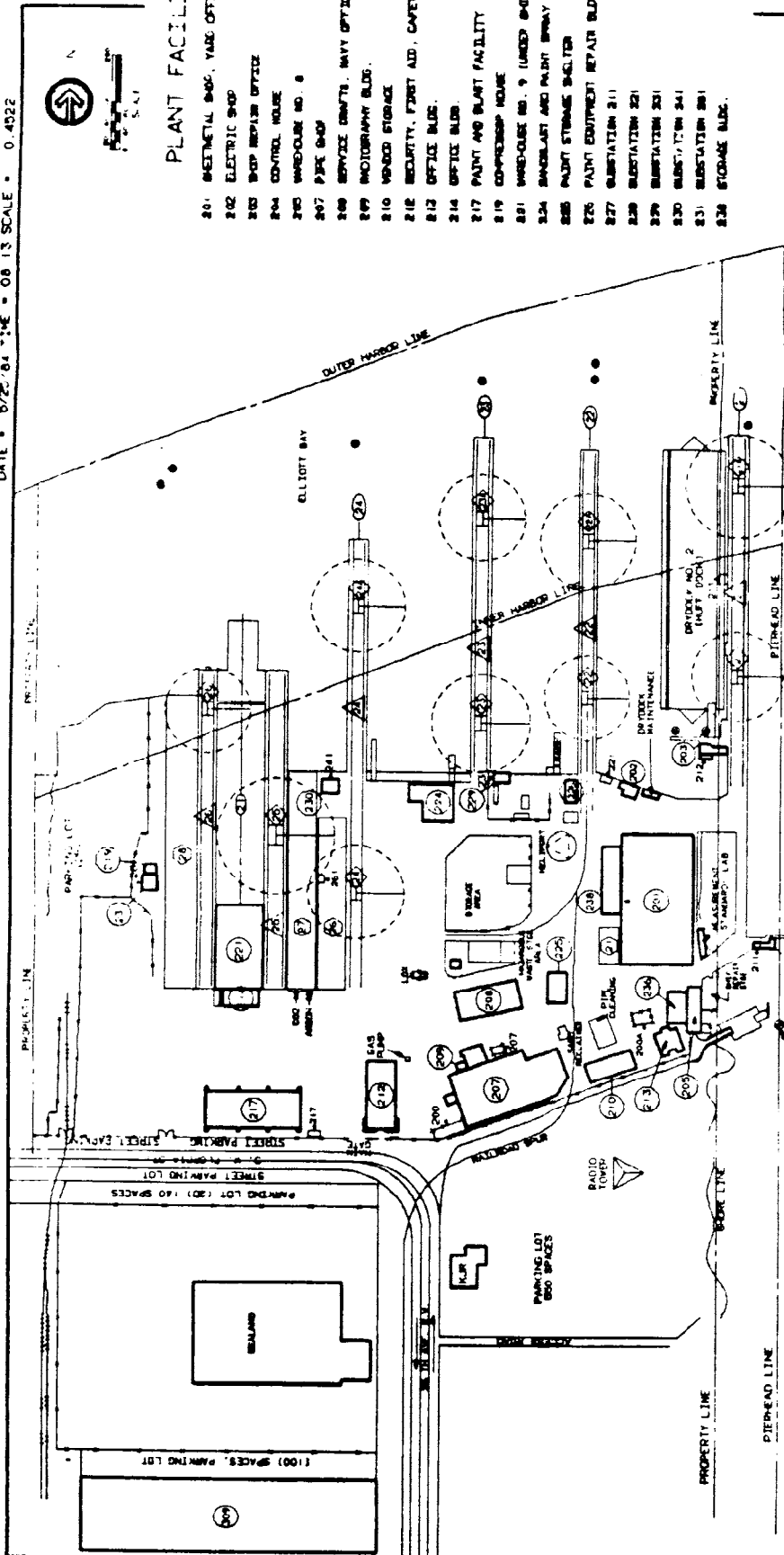
- 101 ADMINISTRATION BLDG
- 102 ADMINISTRATION BLDG.
- 103 FIRST AID
- 104 CLASH HOUSE
- 105 CLOCK ATTLES
- 106 PLATE SHOP
- 107 WELD ROD STORAGE
- 108 WELD LIFT BLDG.
- 109 MACHINE SHOP BLDG.
- 110 MAINTENANCE OFFICES, STOCK ROOM
- 111 COMPRESSOR HOUSE (BURY) SUBSTATION 6A
- 112 PAINT SHOP/OFFICE BLDG.
- 113 WAREHOUSE NO. 2
- 114 WAREHOUSE NO. 3
- 115 BLENDING & DILUTATIONS
- 116 MAINTENANCE & ELECTRIC SHOP
- 117 ELECTRIC SHOP
- 118 ELECTRONIC SHOP/CADAM
- 119 TELEPHONE HALL
- 120 STEEL OFFICE (UNDER SHOPWAY 1)
- 121 WAREHOUSE NO. 4 (UNDER SHOPWAY 1)
- 122 MAINTENANCE STORAGE BLDG.
- 123 SHAPE INFORMATION FACILITY
- 124 NYC PLASMA CUTTING FACILITY
- 125 PAINT BLDG.
- 126 WELDING WATER BLDG.
- 127 SANDBLAST & PAINT FACILITY
- 128 BOLDER HOUSE
- 129 MAINTENANCE PAINT SHOP BLDG.
- 130 SUBSTATION 1A
- 131 SUBSTATION 1A & 4B
- 132 SUBSTATION 1A & 7B
- 133 COMPRESSOR HOUSE
- 134 SUPPLIER WAREHOUSE
- 135 WAREHOUSE NO. 5
- 136 UNIT ASSEMBLY BLDG.



- SYMBOLS
- BUILDINGS
  - ◇ WORKY CHANGES
  - △ DRIVEWAYS
  - ◊ PIONS
  - ◡ SLABS
  - ◌ SHOPWAYS
  - SUBSTATIONS

**LOCKHEED SHIPBUILDING COMPANY**  
 PLANT ONE  
 3039 16th AVE S.W., SEATTLE, WASHINGTON

LAST FILE - 84114 USER - 3220A DRAMID - A-296 D.  
 DATE - 5/22/84 TIME - 08 13 SCALE - 0.4022



**PLANT FACILITIES**

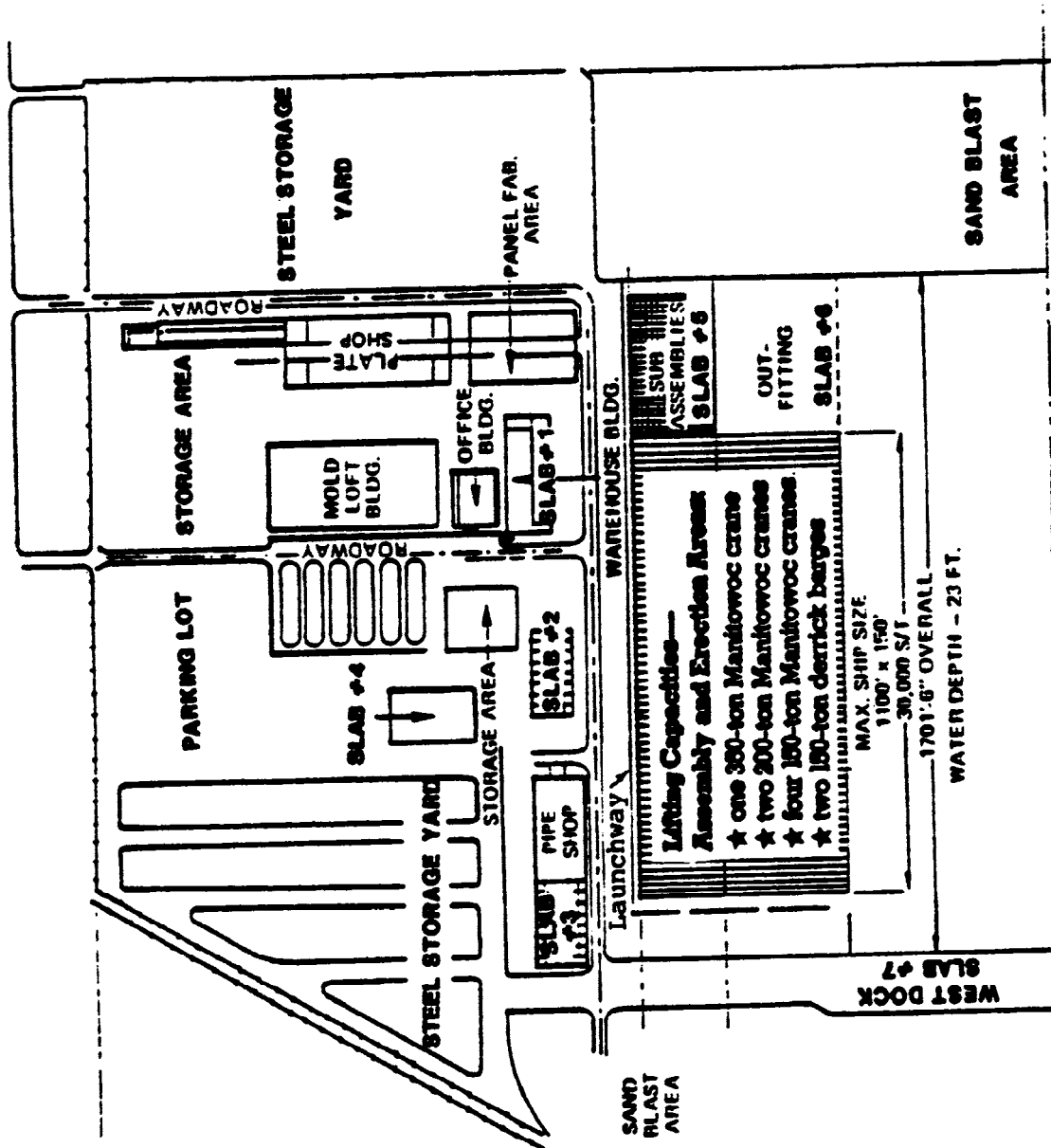
- 201 SHEETMETAL SHOP, YARD OFFICES, LOCKER ROOMS
- 202 ELECTRIC SHOP
- 203 SHOP REPAIR OFFICE
- 204 CONTROL HOUSE
- 205 WAREHOUSE NO. 8
- 207 PUMPS SHOP
- 208 SERVICE CRAFTS, NAVY OFFICES, SAFETY
- 209 PHOTOGRAPHY BLDG.
- 210 WAREHOUSE STORAGE
- 212 SECURITY, FIRST AID, CATERERIA, LOCKER ROOMS
- 213 OFFICE BLDG.
- 214 OFFICE BLDG.
- 217 PAINT AND BLAST FACILITY
- 219 COMPRESSOR BLDG.
- 221 WAREHOUSE NO. 9 (USED OFFWAY B11)
- 224 SANDBLAST AND PAINT BRNRY FACILITY
- 225 PAINT STRINGS SHELTER
- 226 PAINT EQUIPMENT REPAIR BLDG.
- 227 SUBSTATION 211
- 228 SUBSTATION 201
- 229 SUBSTATION 201
- 230 SUBSTATION 241
- 231 SUBSTATION 201
- 232 STORAGE BLDG.

**LOCKHEED SHIPBUILDING COMPANY**

**PLANT TWO**

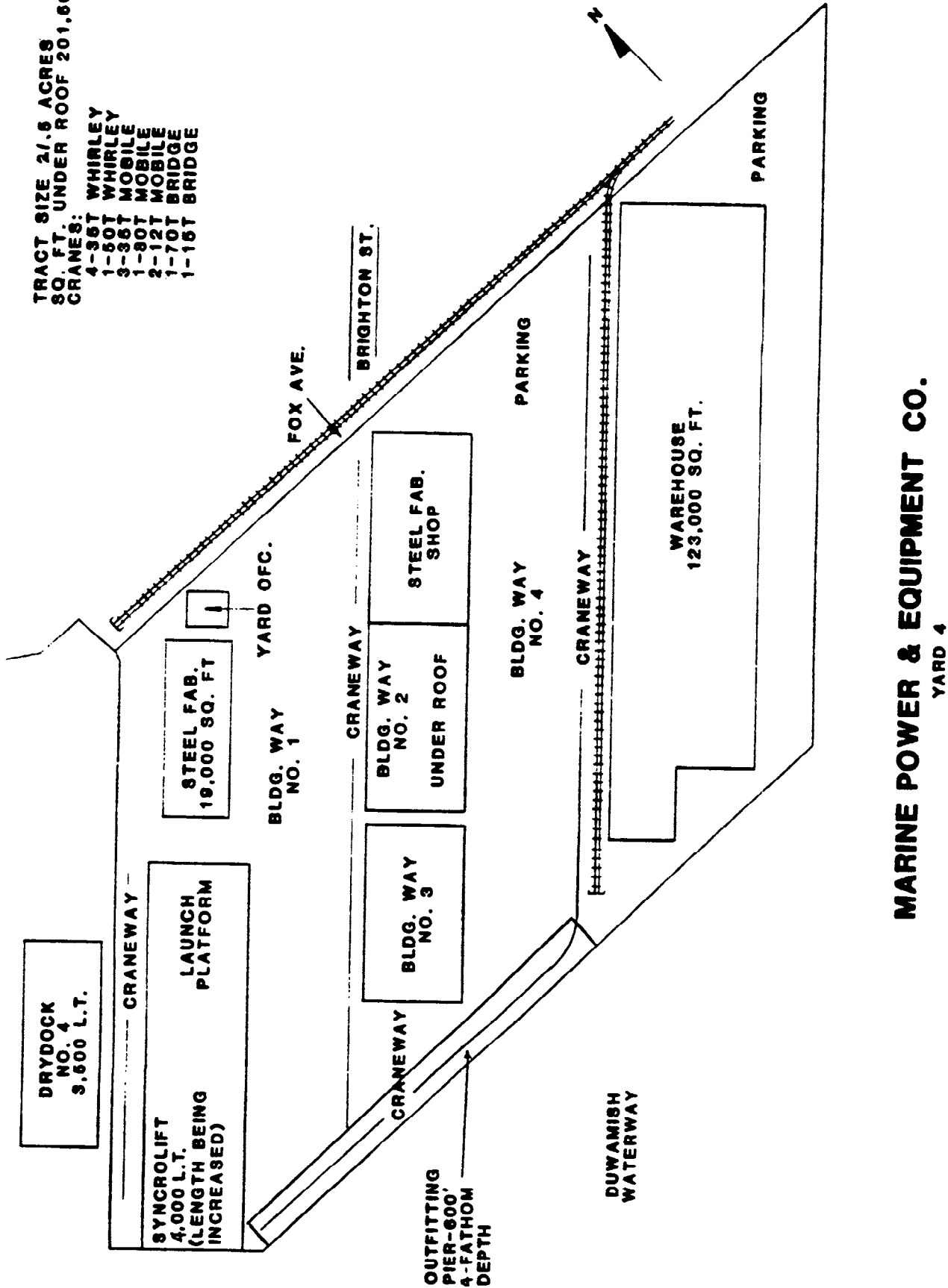
3550 S. W. FLORIDA, SEATTLE, WASHINGTON

- PIPERHEAD LINE
- SYMBOLS**
- BUILDINGS
  - ◇ CANALS
  - ◡ PIER
  - ◡ BLANK
  - ◡ PATHWAYS



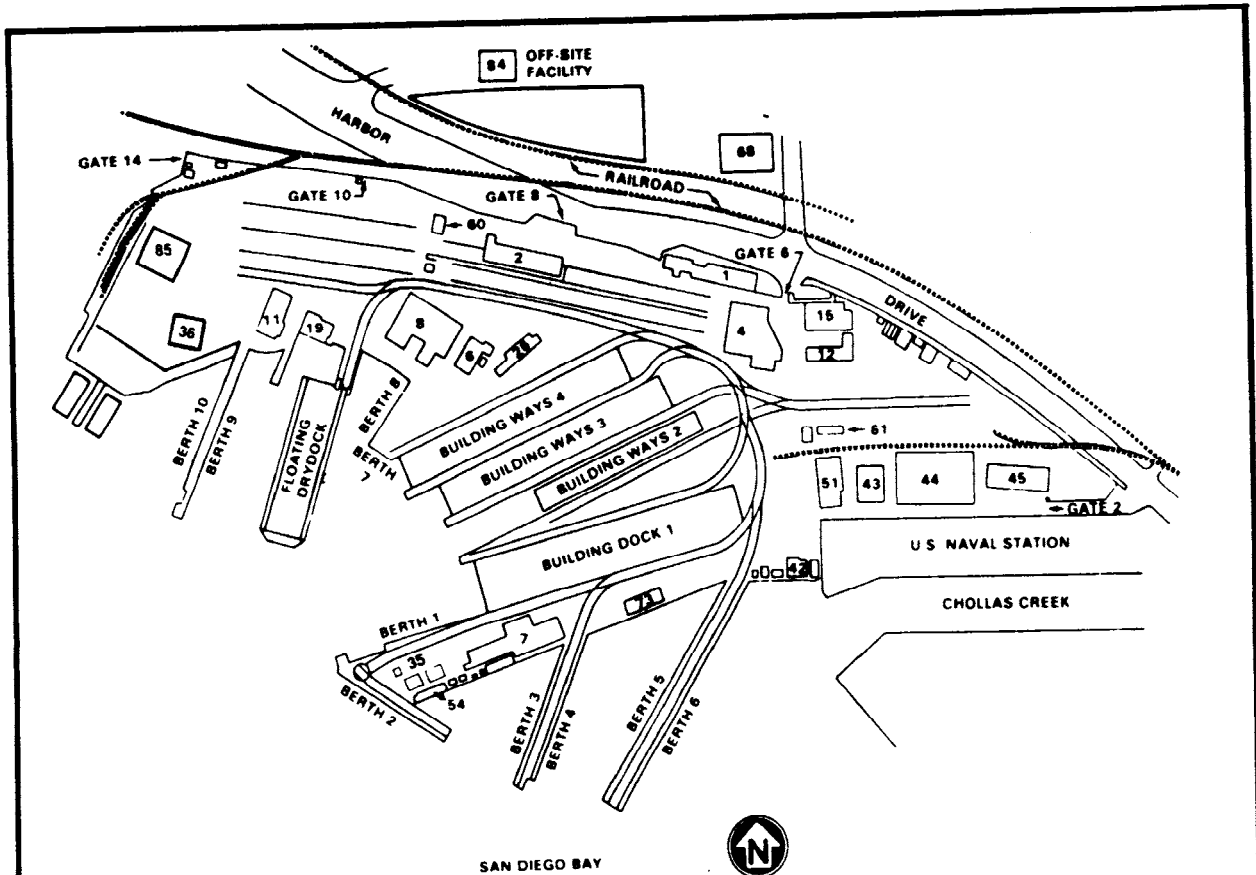
**MARATHON LeTOURNEAU CO.**  
**GULF MARINE DIVISION**

TRACT SIZE 21.6 ACRES  
 SQ. FT. UNDER ROOF 201,600  
 CRANES:  
 4-36T WHIRLEY  
 1-50T WHIRLEY  
 3-36T MOBILE  
 1-30T MOBILE  
 2-12T MOBILE  
 1-70T BRIDGE  
 1-16T BRIDGE



**MARINE POWER & EQUIPMENT CO.**  
 YARD 4

NASSCO SHIPYARD LAYOUT



SAN DIEGO BAY



**BLDG. NO.**

- 1 ADMINISTRATION BUILDING
- 2 PLATE SHOP
- 4 PIPE SHOP
- 6 INSTRUMENT SHOP/MOTOR SHOP/REPAIR  
ELECTRICAL SHOP
- 7 SHEETMETAL SHOP/NEW CONSTRUCTION  
ELECTRICAL SHOP
- 8 MACHINE SHOP/REPAIR DEPARTMENT/REPAIR  
PRODUCTION MANAGEMENT
- 11 STORAGE
- 12 MAINTENANCE
- 15 ADMINISTRATION ANNEX
- 19 CARPENTER SHOP
- 26 PLATEN OFFICE

**BLDG. NO.**

- 35 GOVERNMENT TECHNICAL REPRESENTATIVE/  
SHIP'S FORCE WORK AND STORAGE SUPPORT
- 36 COMBAT SYSTEMS SHOP
- 42 YARD CONFERENCE ROOM
- 43 WAREHOUSE
- 44 WAREHOUSE
- 45 WAREHOUSE
- 51 ENGINEERING
- 54 QUALITY ASSURANCE
- 60 FLAME PLANER SHED
- 61 WELDING OFFICE
- 68 INFORMATION SYSTEMS
- 84 WAREHOUSE
- 85 GRITBLAST & PRECONSTRUCTION PRIMER SHOP

**DOCKS AND WAYS**

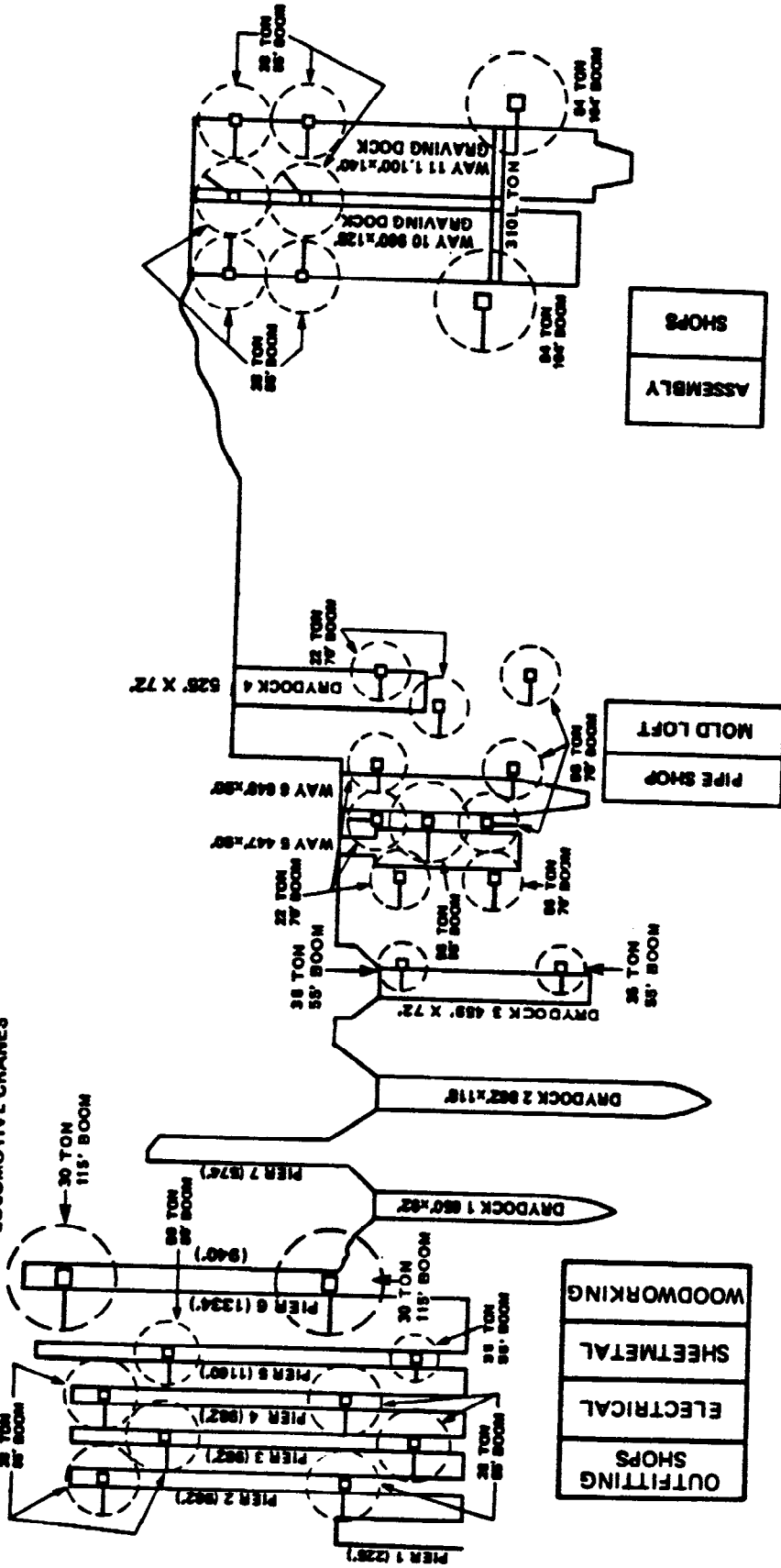
- |                                 |   |
|---------------------------------|---|
| BUILDING DOCK 1<br>1000' x 176' | BUILDING WAYS 4<br>906' x 115'  |
| BUILDING WAYS 2<br>675' x 96'   | FLOATING DRY DOCK<br>585' x 170'<br>(140' CLEAR<br>BETWEEN WINGWALLS) |
| BUILDING WAYS 3<br>906' x 115'  |   |

**BERTHS**

- |                            |                             |
|----------------------------|-----------------------------|
| BERTH 1<br>600' x 30' DEEP | BERTH 6<br>1000' x 35' DEEP |
| BERTH 2<br>900' x 30' DEEP | BERTH 7<br>150' x 23' DEEP  |
| BERTH 3<br>560' x 30' DEEP | BERTH 8<br>300' x 23' DEEP  |
| BERTH 4<br>625' x 30' DEEP | BERTH 9<br>700' x 28' DEEP  |
| BERTH 5<br>950' x 35' DEEP | BERTH 10<br>650' x 28' DEEP |

PIERS 7 AND DRYDOCKS ARE SERVED BY LOCOMOTIVE CRANES

JAMES RIVER



**Newport News Shipbuilding**  
South Yard

WOODWORKING  
SHEETMETAL  
ELECTRICAL  
SHOPS  
OUTFITTING

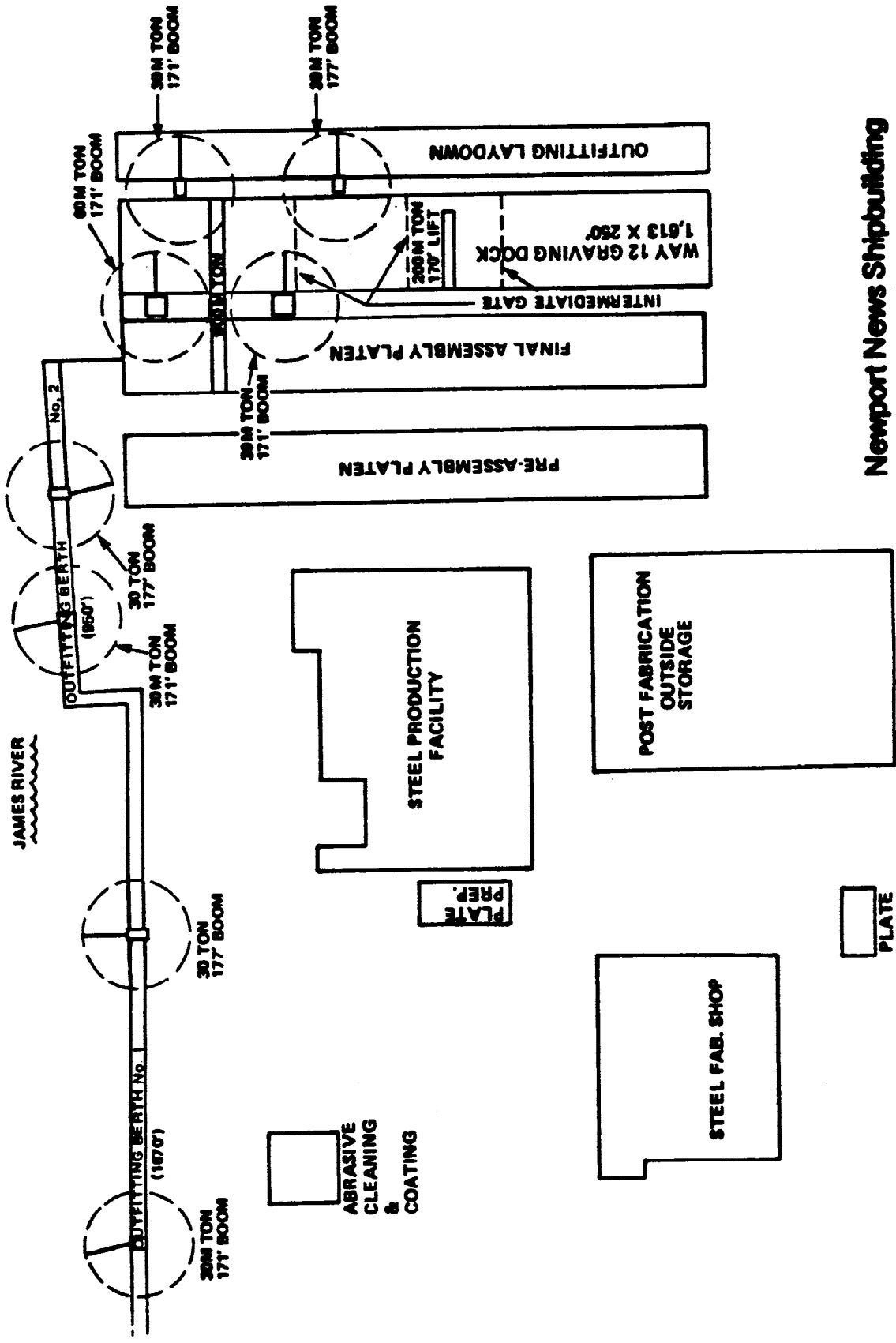
MACHINE SHOPS

CONSOLIDATED WAREHOUSE

PATTERN-MAKERS  
FOUNDRY

PIPE SHOP  
MOLD LOFT

ASSEMBLY  
SHOPS



**Newport News Shipbuilding**

NORTH YARD

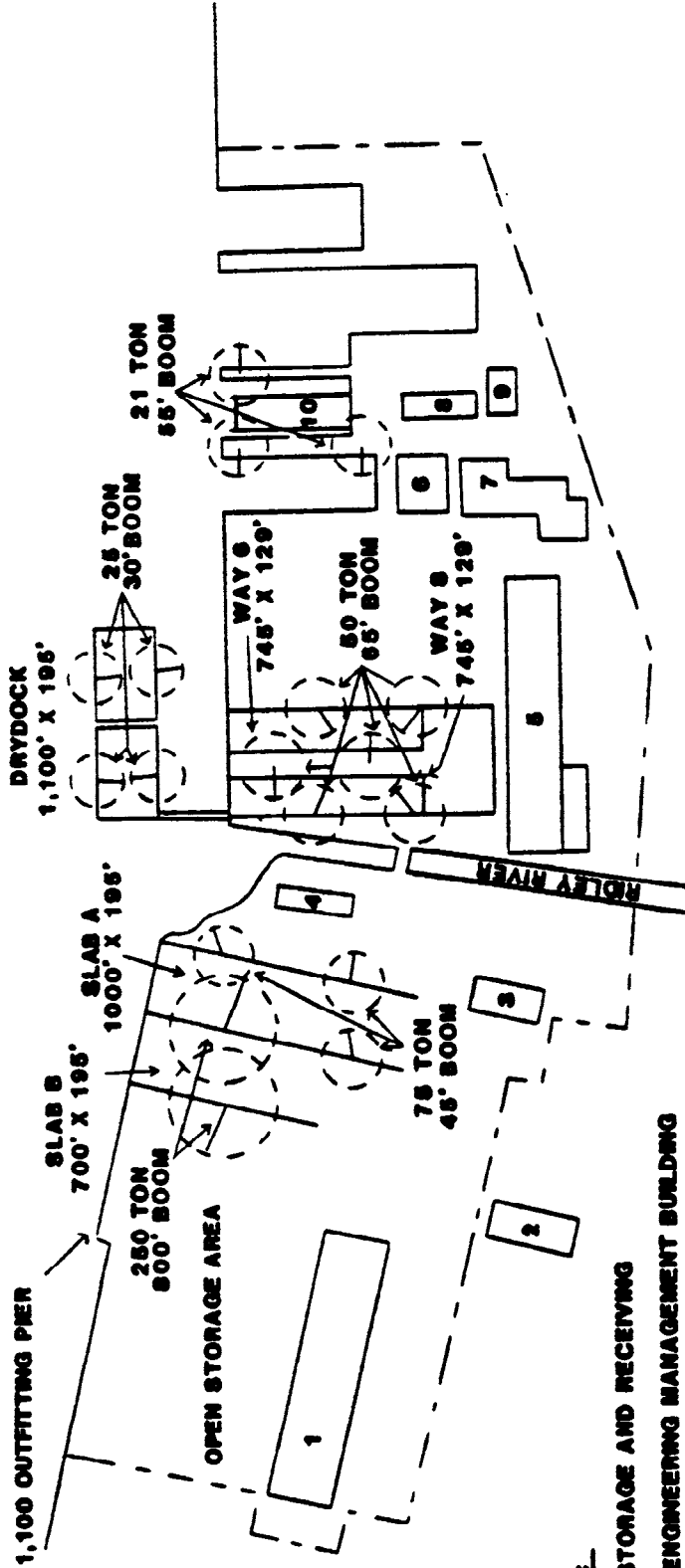




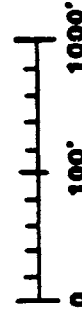
CENTRAL YARD

DELAWARE RIVER

NORTH YARD



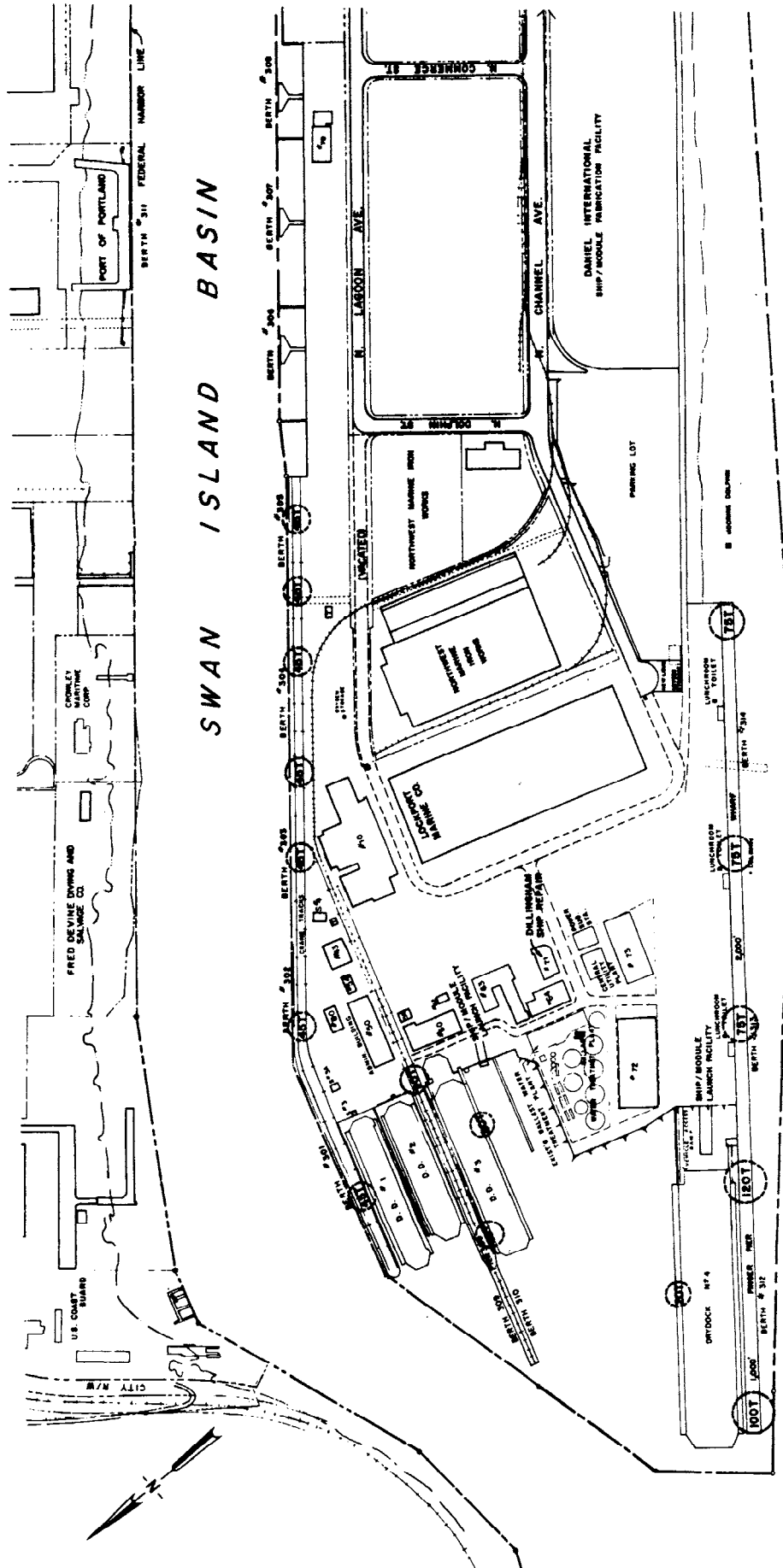
SCALE:



**KEY:**

- 1. STORAGE AND RECEIVING
- 2. ENGINEERING MANAGEMENT BUILDING
- 3. BLAST AND PAINT FACILITY
- 4. MULTIPURPOSE BUILDING
- 5. FABRICATION SHOP
- 6. STORE HOUSE
- 7. BOILER AND MISC. SHOPS
- 8. PIPE SHOP
- 9. MAIN OFFICE
- 10. DRYDOCK FROM LEVINGSTON, ORANGE, TEXAS

**PENNSYLVANIA SHIPBUILDING CO.**

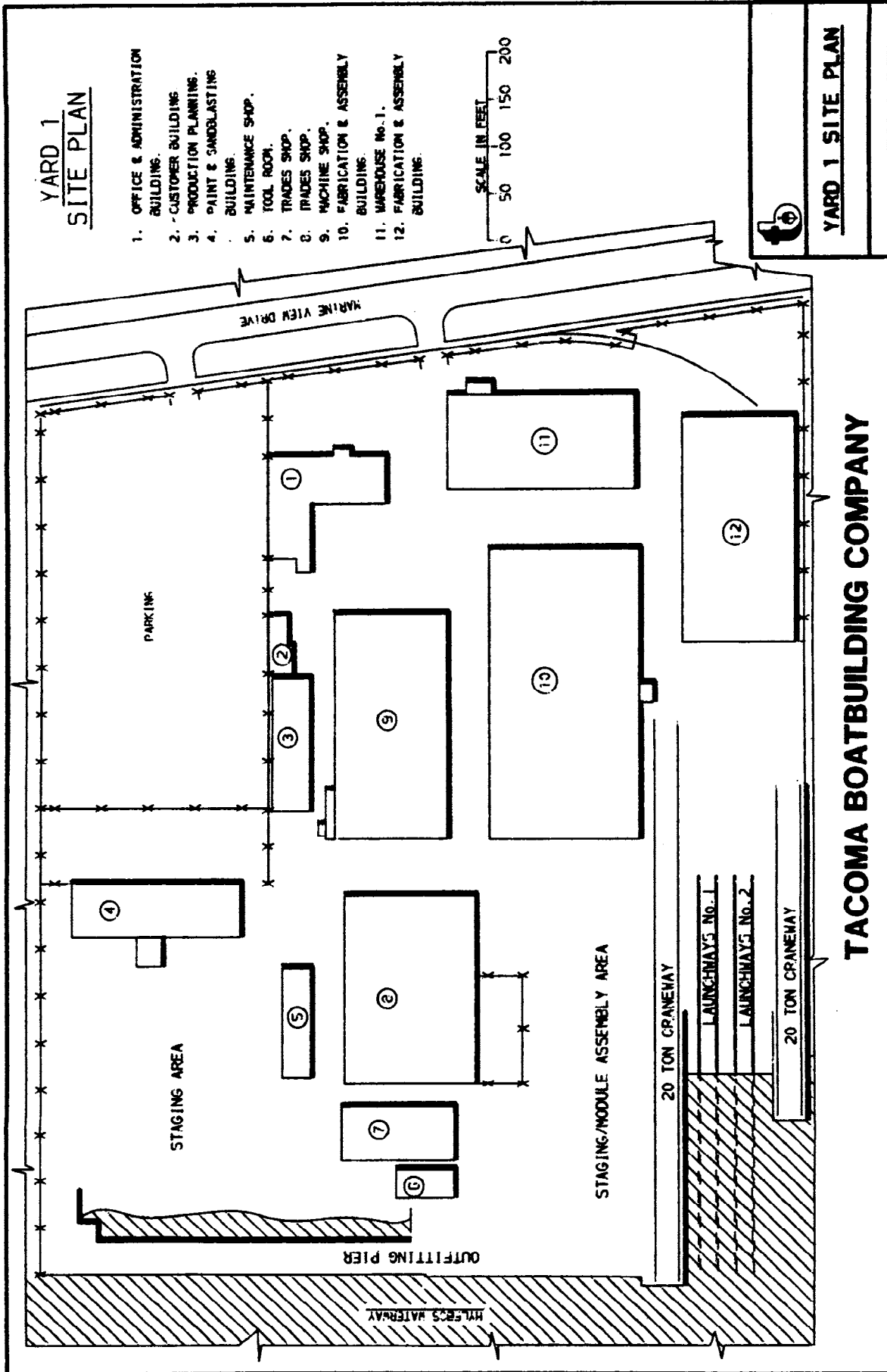


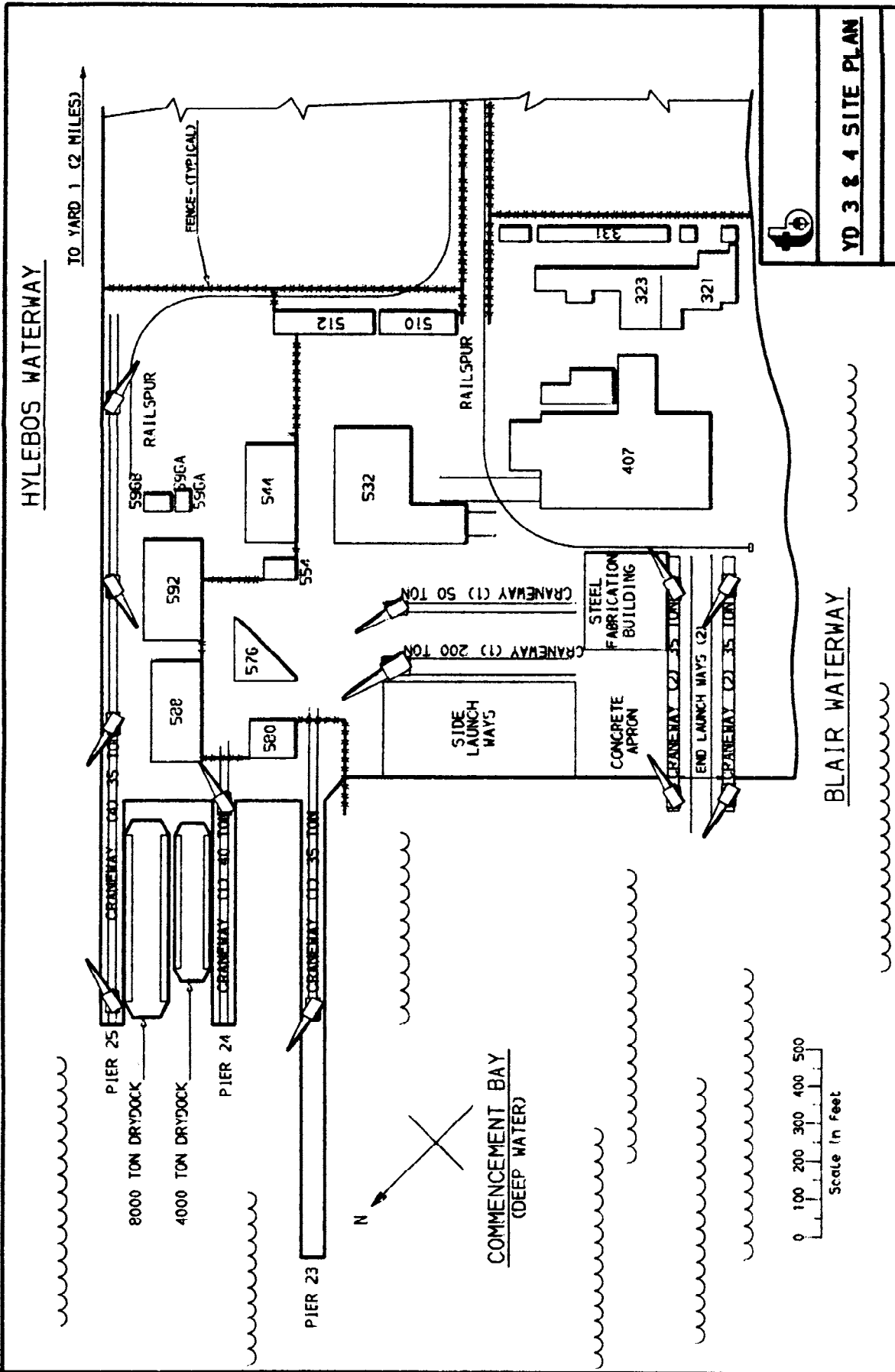
WILLAMETTE RIVER

# PORTLAND SHIP REPAIR YARD

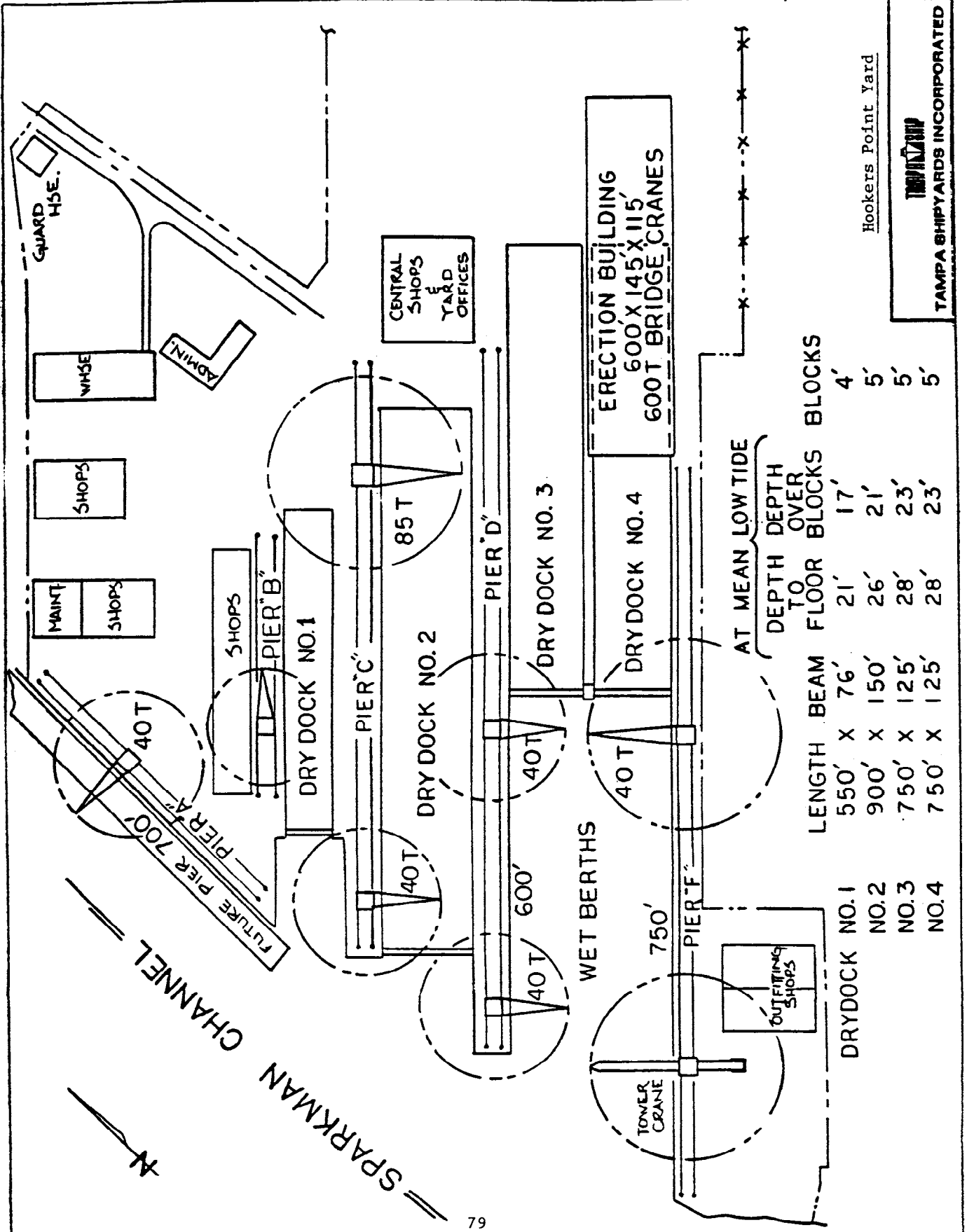


Port of Portland





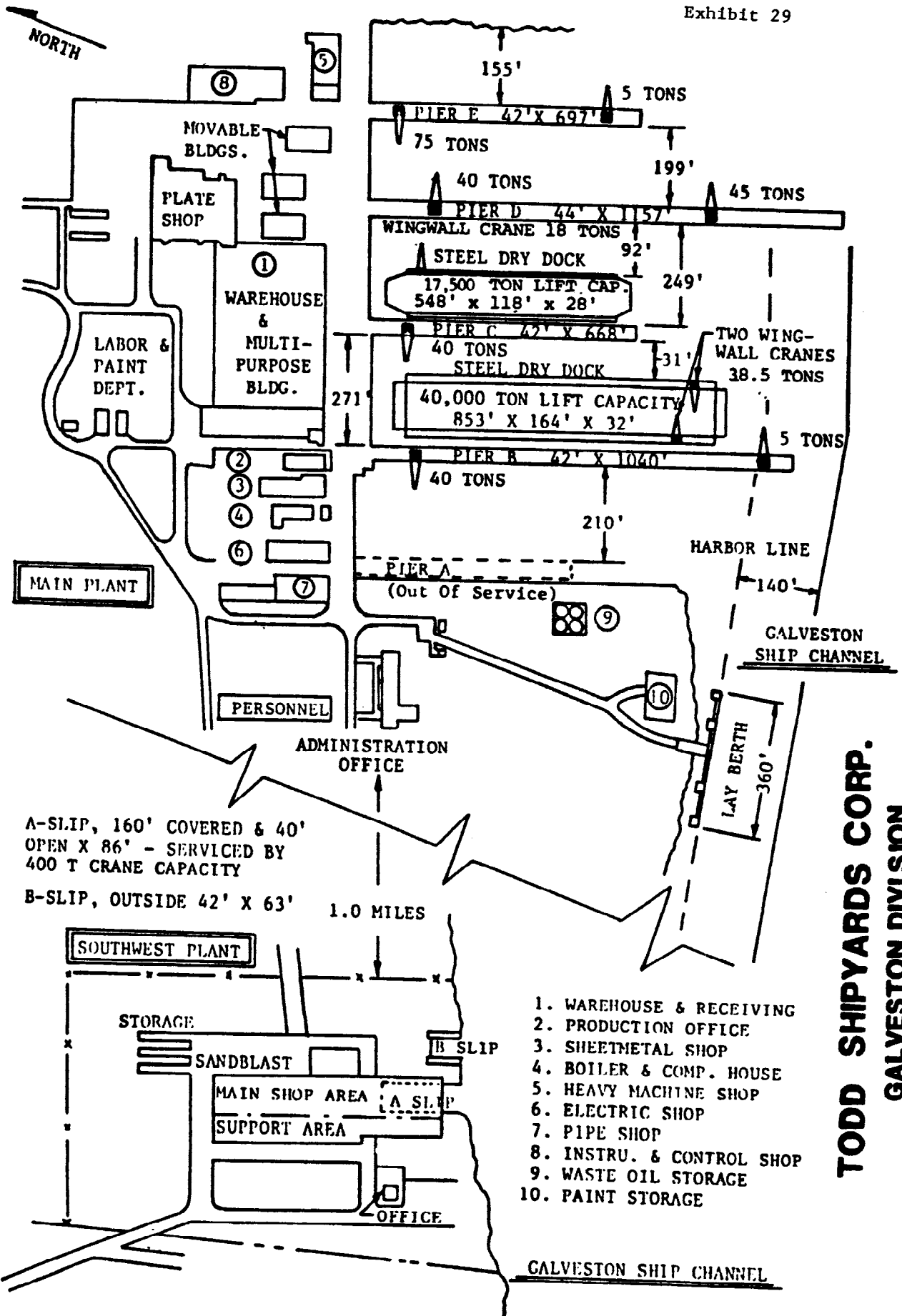
**TACOMA BOATBUILDING COMPANY**



Hookers Point Yard

**HOOKERS**

TAMPA SHIPYARDS INCORPORATED



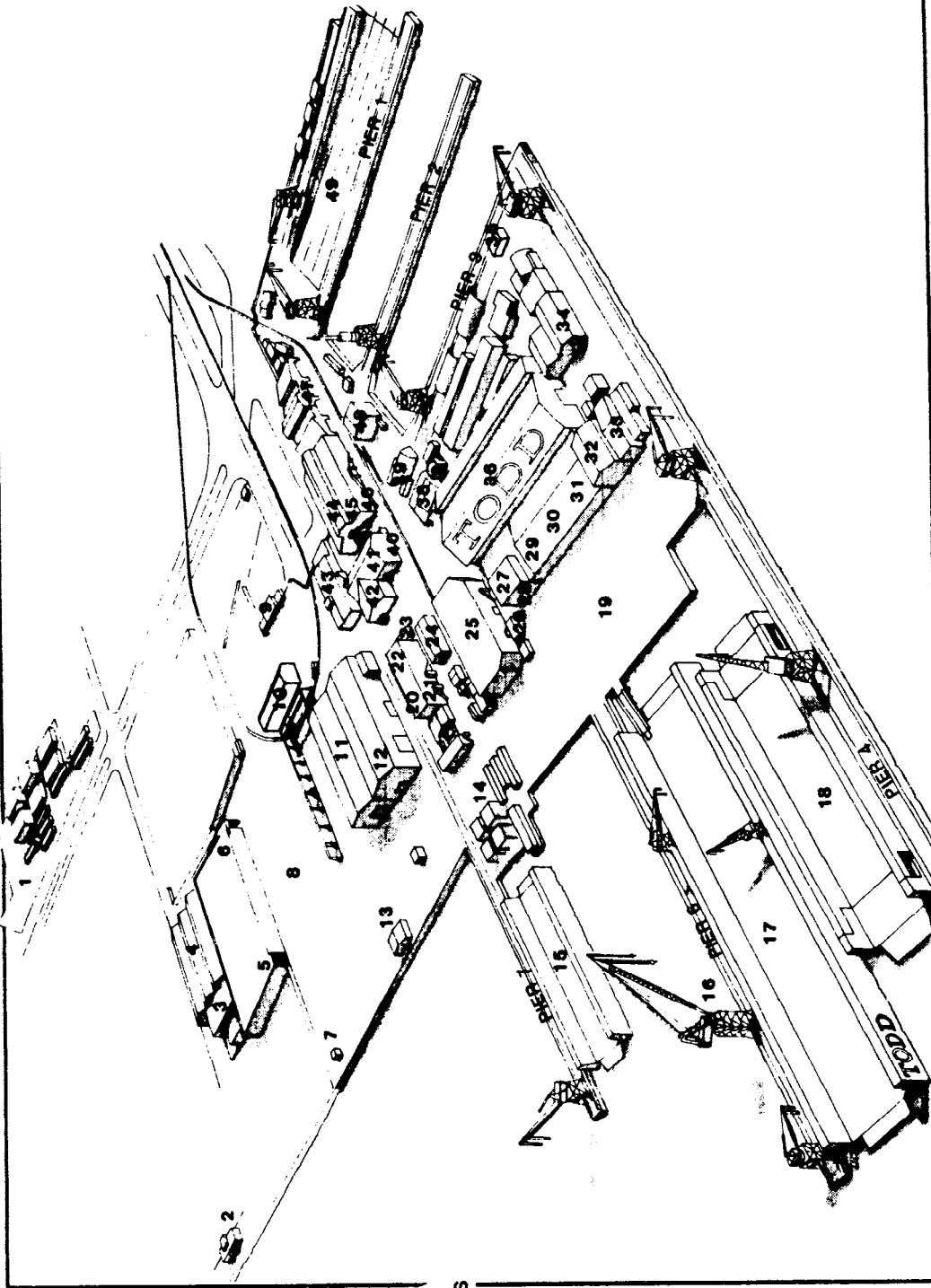
**TODD SHIPYARDS CORP.  
GALVESTON DIVISION**

- 1. WAREHOUSE & RECEIVING
- 2. PRODUCTION OFFICE
- 3. SHEETMETAL SHOP
- 4. BOILER & COMP. HOUSE
- 5. HEAVY MACHINE SHOP
- 6. ELECTRIC SHOP
- 7. PIPE SHOP
- 8. INSTRU. & CONTROL SHOP
- 9. WASTE OIL STORAGE
- 10. PAINT STORAGE





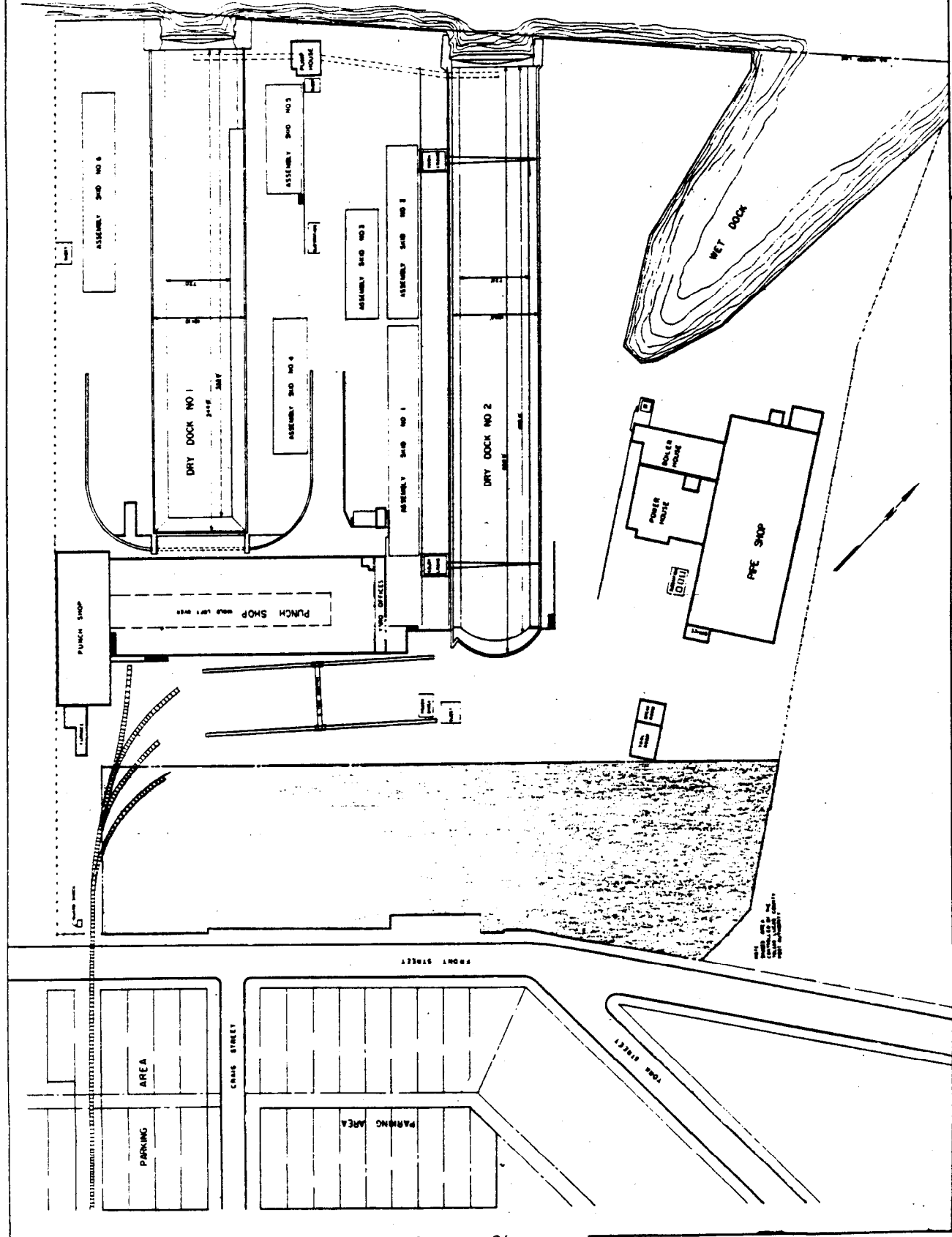




1. CREW'S BERTHING
2. MESSING FACILITY
3. SHIPPING/RECEIVING
4. WAREHOUSE
5. DATA PROCESSING
6. PURCHASING
7. SMALL BOAT COVERED WORK AREA
8. STEEL STORAGE AREA
9. MAIN GATE/SECURITY
10. SHOT BLAST FACILITY
11. ALUMINUM FABRICATION
12. AUTOMATED BURNING EQUIPMENT
13. ACID BATH CLEANING
14. SITE OF SHIP'S OFFICE AND DUTY BERTHING
15. DRYDOCK NO. 2
16. 150 TON WHIRLEY CRANE
17. DRYDOCK NO. 3 "EMERALD SEA"
18. DRYDOCK NO. 1
19. STAGING AREA
20. PRODUCTION PLANNING
21. CAFETERIA
22. NEW CONSTRUCTION SHIP SUPERINTENDENTS
23. COMBAT SYSTEMS DEPARTMENT
24. OUTSIDE MACHINE SHOP
25. INSIDE MACHINE SHOP
26. PORT ENGINEERS OFFICE
27. REPAIR SUPERINTENDENTS
28. YARD OFFICE
29. PIPE SHOP
30. CENTRAL TOOL ROOM
31. CARPENTER SHOP
32. ELECTRIC SHOP
33. RIGGING LOFT
34. SHEET METAL
35. QUALITY ASSURANCE
36. MAIN STEEL SHOP
37. MARINE CHEMIST/FIRE DEPT.
38. PUMP, MOTOR & VALVE SHOP/TEST FACILI
39. PAINT SHOP
40. DISPENSARY/CLAIMS DEPT.
41. ENGINEERING
42. NAVY PROGRAM OFFICE
43. ADMINISTRATION OFFICES
44. TECHNICAL LIBRARY DRAWING CONTROL
45. TEST & TRIAL OFFICE
46. GENERAL SUPERINTENDENTS
47. SOUTH STEEL SHOP
48. MISSILE LAUNCHER ASSEMBLY BUILDING
49. CONSTRUCTION WAYS

**PACIFIC SHIPYARDS CORPORATION**  
**SEATTLE DIVISION**

MAUMEE RIVER



MERCE INDUSTRIES  
2115 STREET ST.  
MADISON, WIS.

DATE: 10-13-53

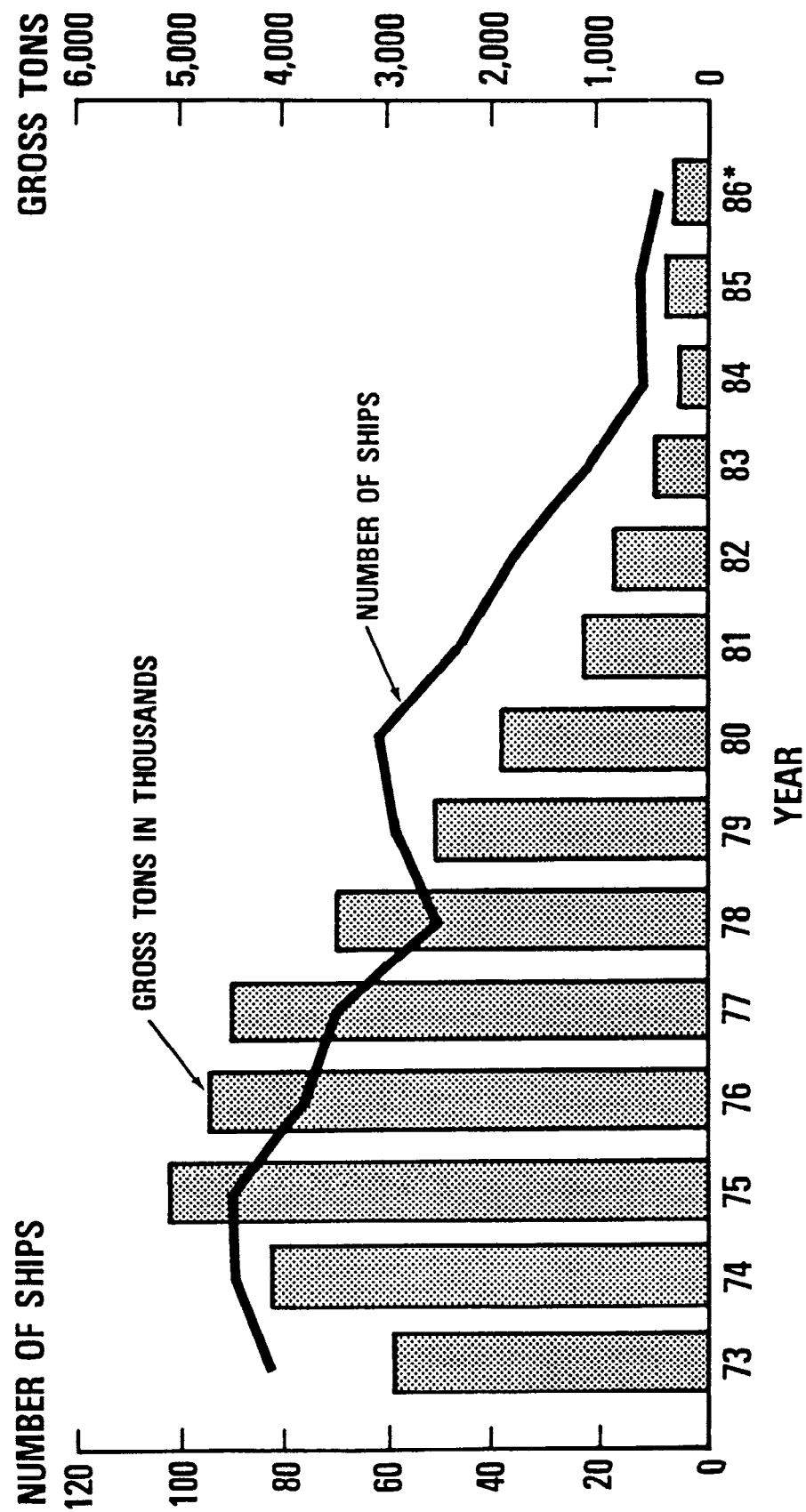
GENERAL ARRANGEMENT

THE TOLEDO SHIPYARD



# MERCHANT VESSELS BUILDING OR ON ORDER (AS OF JANUARY 1)

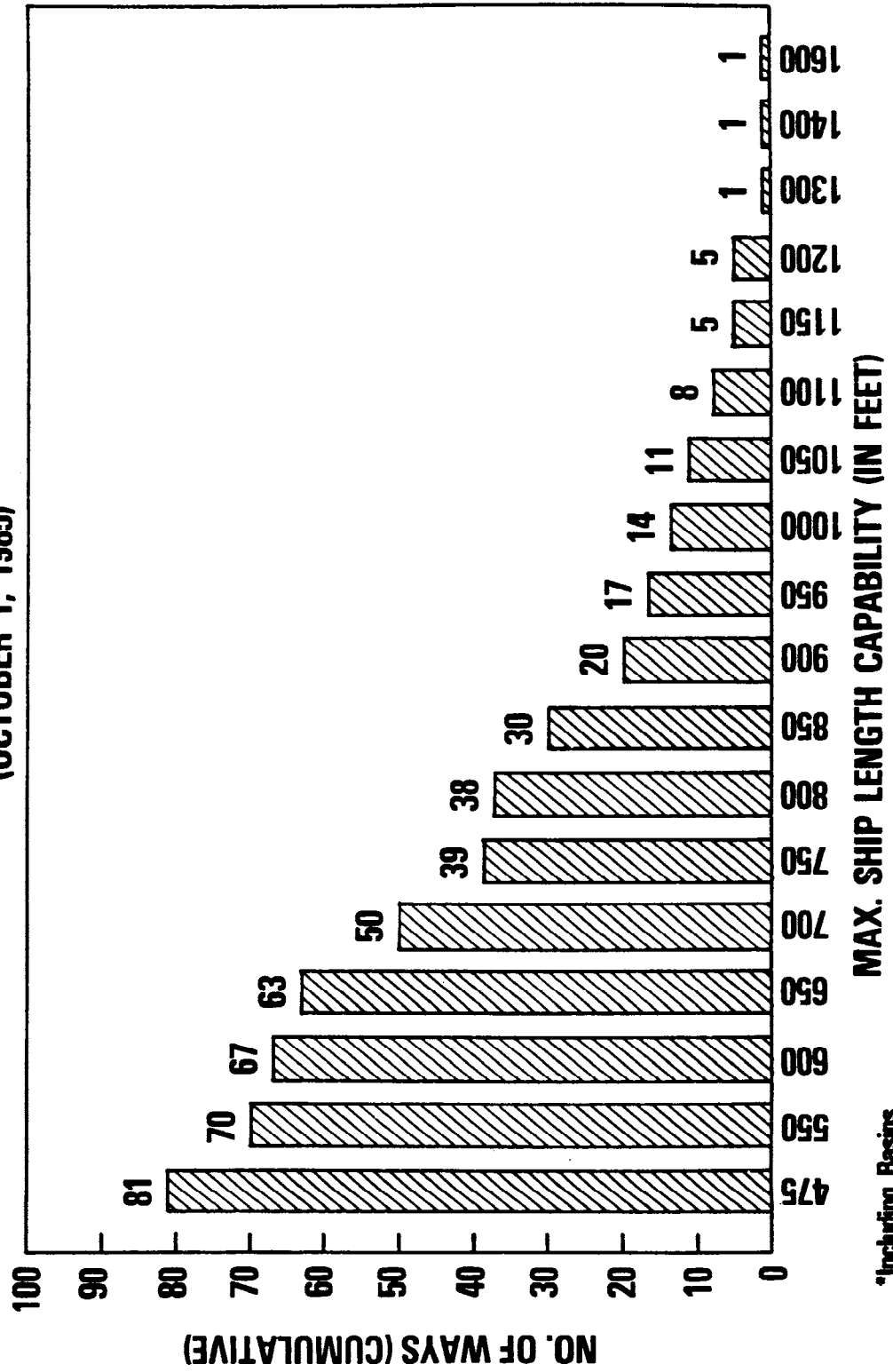
SHIPS OF 1,000 GROSS TONS AND OVER



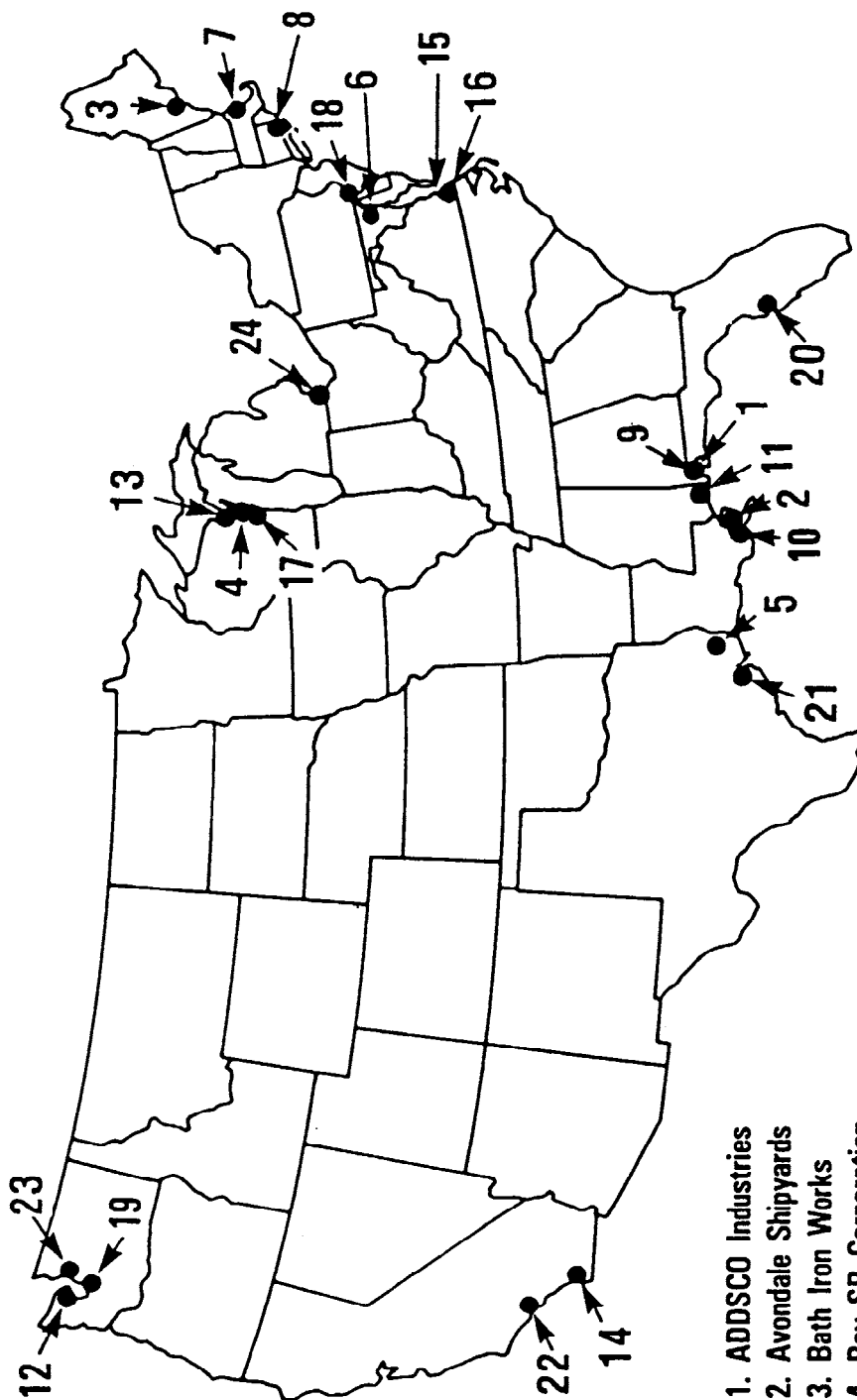
SOURCE: MARITIME ADMINISTRATION

\*FORECAST

**MAJOR U.S. PRIVATE SHIPYARDS**  
**\*NUMBER OF SHIPWAYS BY MAXIMUM LENGTH**  
**CAPABILITY**  
**(OCTOBER 1, 1985)**



**ACTIVE U.S. SHIPBUILDING BASE**

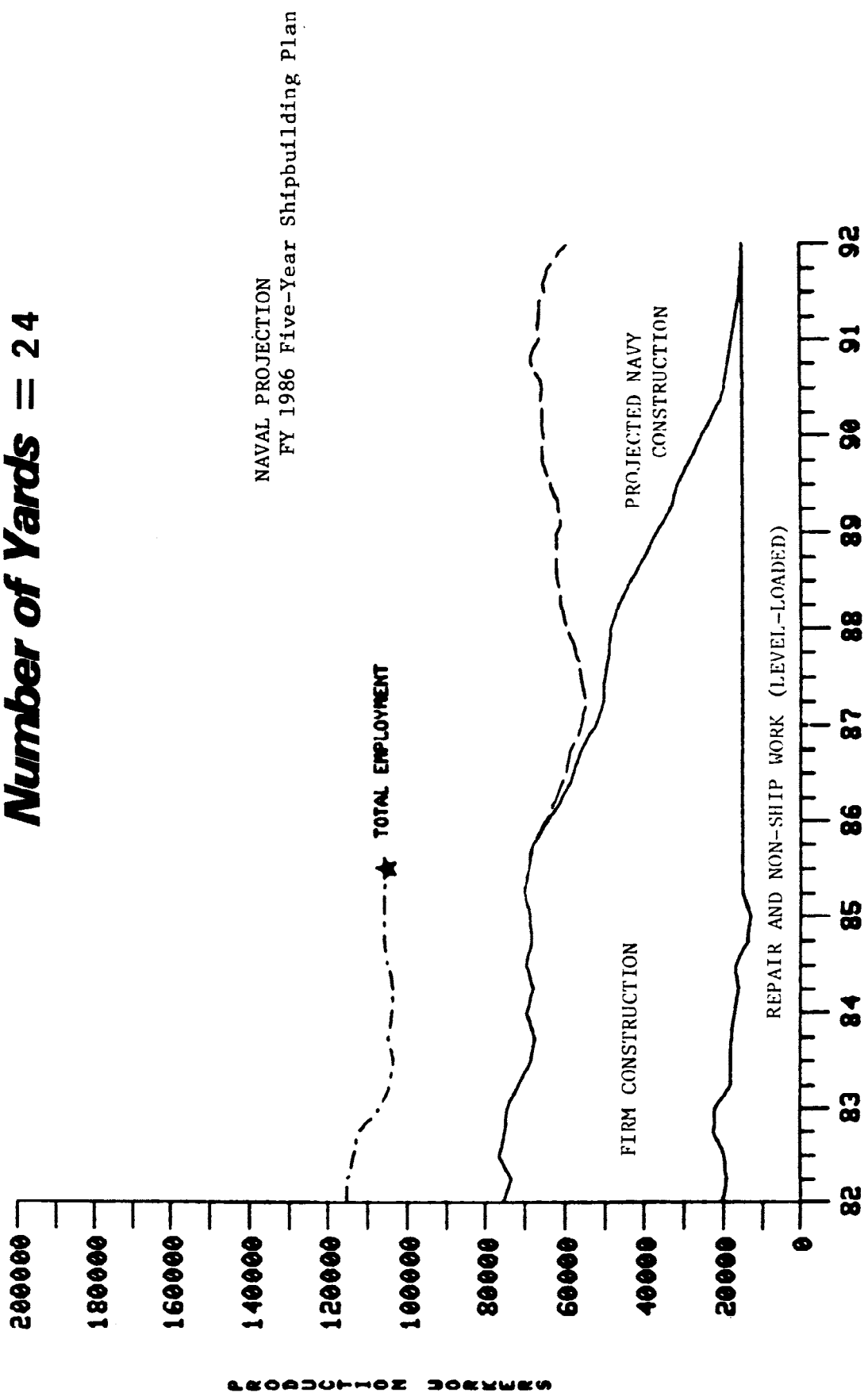


- 1. ADDSCO Industries
- 2. Avondale Shipyards
- 3. Bath Iron Works
- 4. Bay SB Corporation
- 5. Beth-Beaumont
- 6. Beth-Sparrows Point
- 7. Gen. Dyn.-Quincy
- 8. Gen. Dyn.-Elec. Boat
- 9. Halter Marine-Chickasaw
- 10. Halter Marine-Equitable
- 11. Litton/Ingalls
- 12. Lockheed SB
- 13. Marinette
- 14. NASSCO
- 15. Newport News
- 16. Norfolk SB & DD
- 17. Peterson
- 18. Penn Ship
- 19. Tacoma Boat
- 20. Tampa Ship
- 21. Todd-Galveston
- 22. Todd-Los Angeles
- 23. Todd-Seattle
- 24. Toledo Shipyard

# Shipbuilding Industry Workload Projection

## Active Shipbuilding Base Summation

### Number of Yards = 24



OCTOBER 1, 1985

SOURCE: SHIPYARD DATA FROM FORM NAES2 WHEN PROVIDED  
OFFICE OF SHIPBUILDING COSTS AND PRODUCTION, MARITIME ADMINISTRATION



TABLE 1

SHIP CONSTRUCTION CAPABILITY

BY SHIP TYPE

1/ LEGEND  
Maximum Ship Size

SW = Shipway  
 CD = Craving Dock  
 LL = Land Level Position  
 SL = Syncrolift

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPE

SHIPYARD	BUILDING POSITION (Number)	General Cargo										Dry Bulk						
		Gen. Cargo 475 X 68	Mob. Cargo 724 X 106	Container 610 X 90	RO/RO 684 X 102	LASH 893 X 100	Container 947 X 106	21,300 570 X 75	51,000 600 X 105	100,000 900 X 106								
<u>EAST COAST</u>																		
Bath Iron Works	650 X 88SW (2) 700 X 130SW	1 2 3	0 0 0	1 2 3	0 2 2	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 2 3	0 2 2	0 0 0					
Bethlehem Steel, Sparrows Point	800 X 106SW 800 X 95SW 1200 X 192GD	1 1 4 6	1 0 1 2	1 1 3 5	1 0 2 3	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	1 1 4 6	1 0 2 3	0 0 2 3	0 0 1 1				
Coastal Drydock	755 X 102GD 717 X 110GD (2) 1082 X 141GD	1 1 4 6	0 0 2 2	1 1 2 4	1 1 2 4	0 0 2 2	0 0 2 2	0 0 2 2	0 0 2 2	0 0 2 2	1 1 2 4	0 1 2 3	0 1 2 3	0 0 2 2				
General Dynamics, Quincy	(2) 860 X 123GD 936 X 143GD (2) 860 X 146GD	4 2 4 10	2 1 2 5	2 1 2 5	2 1 2 5	0 1 0 1	0 0 0 0	0 1 0 1	0 0 0 0	0 0 0 0	2 1 2 5	2 1 2 5	2 1 2 5	0 1 0 1				
Newport News	649 X 93SW 715 X 93SW 960 X 124GD 1100 X 130GD 1600 X 246GD	1 1 2 2 9 15	0 0 1 1 4 6	1 1 2 2 5 11	0 0 1 1 4 6	0 0 1 1 2 4	0 0 1 1 2 4	0 0 1 1 2 4	0 0 1 1 2 4	0 0 1 1 2 4	1 1 2 2 6 12	0 0 1 1 2 4 7	0 0 1 1 2 4 7	0 0 1 1 1 1 3				

1/ LEGEND  
Maximum Ship Size

SW = Shipway  
 GD = Graving Dock  
 LL = Land Level Position  
 SL = Syncrolift

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPE

SHIPYARD	BUILDING POSITION (Number)	General Cargo							Dry Bulk		
		Gen. Cargo 475 X 68	Mob. Cargo 724 X 106	Container 610 X 90	RO/RO 684 X 102	LASH 893 X 100	Container 947 X 106	21,300 570 X 75	51,000 600 X 105	100,000 900 X 106	
Norfolk SB & DD	475 X 85SW	1 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	
Penn Ship	(2) 825 X 136SW 700 X 195LL 1000 X 195LL	2 1 2 5	2 1 1 4	2 1 1 4	2 1 1 6	0 0 1 1	0 0 1 1	2 1 1 4	2 1 1 4	0 0 1 1	
<u>GULF CONST</u>											
ADDECO	(4) 523 X 90SW 620 X 105SW	4 1 5	0 0 0	0 1 1	0 0 0	0 0 0	0 0 0	0 1 1	0 0 0	0 0 0	
Avondale	(2) 1020 X 175LL (3) 1200 X 126LL	8 6 14	2 4 6	3 5 8	3 4 7	2 4 6	2 3 5	6 6 12	3 5 8	2 3 5	
Bethlehem, Beaumont	800 X 96SW	1 1	0 0	1 1	0 0	0 0	0 0	1 1	0 0	0 0	
Halter Marine, Chickasaw	550 X 75SW	1 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	

1/ LEGEND  
Maximum Ship Size

SW = Shipway  
 GD = Graving Dock  
 LL = Lard Level Position  
 SL = Syncrolift

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPE

SHIPYARD	BUILDING POSITION (Number)	General Cargo							Dry Bulk		
		Gen. Cargo 475 X 68	Mob. Cargo 724 X 106	Container 610 X 90	RO/RO 684 X 102	LASH 893 X 100	Container 947 X 106	21,300 570 X 75	51,000 600 X 105	100,000 900 X 106	
Litton/Ingalls E. & W. Banks	690 X 85SW	1	0	0	0	0	0	1	0	0	
	550 X 80SW	1	0	0	0	0	0	0	0	0	
	(4) 650 X 90SW	4	0	4	0	0	0	4	0	0	
	(5) 1000 X 225LL *	18	15	16	15	0	0	17	15	0	
	1500 X 200LL *	6	2	2	2	0	0	5	2	0	
		30	17	22	17	0	27	17	0		
Marathon, Brownsville	1100 X 150SW	4	1	1	1	1	1	1	1	1	
		4	1	1	1	1	1	1	1	1	
Tampa Shipyards	(2) 746 X 121GD	2	2	2	2	0	0	2	2	0	
		2	2	2	2	0	0	2	2	0	
Todd-Galveston	475 X 85SW	1	0	0	0	0	0	0	0	0	
		1	0	0	0	0	0	0	0	0	
<u>WEST CONST</u> Gunderson, Inc.	800 X 130SW	1	1	1	1	0	0	1	1	0	
		1	1	1	1	0	0	1	1	0	

\* Ship size constrained by maximum launching capability of 850' X 173'.

1/ LEGEND  
Maximum Ship Size

SW = Shipway  
 GD = Graving Dock  
 LL = Land Level Position  
 SL = Syncrolift

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPE

SHIPYARD	BUILDING POSITION (Number)	General Cargo							Dry Bulk		
		Gen. Cargo 475 X 68	Mob. Cargo 724 X 106	Container 610 X 90	RO/RO 684 X 102	LASH 893 X 100	Container 947 X 106	21,300 570 X 75	51,000 600 X 105	100,000 900 X 106	
Lockheed	(2) 650 X 88SW 690 X 90SW	2 1 3	0 0 0	0 1 1	0 0 0	0 0 0	0 0 0	2 1 3	0 0 0	0 0 0	
Marine Power & Equipment	(2) 500 X 104SW	2 2	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	
National Steel & Shipbuilding Co.	690 X 90SW (2) 900 X 106SW 980 X 170GD	1 2 4 7	0 2 1 3	1 2 1 4	0 2 1 3	0 2 1 3	0 0 1 1	1 2 2 5	0 2 1 3	0 2 1 3	
Portland SRY	475 X 100SW	1 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	
Tacoma Boat	650 X 400SW	1 1	0 0	1 1	0 0	0 0	0 0	1 1	1 1	0 0	
Todd-LA	(2) 725 X 87SW 826 X 106LL * 545 X 120LL *	2 3 5	0 1 1	0 2 2	0 0 0	0 0 0	0 0 0	2 2 4	0 2 2	0 0 0	

\* Ship size constrained by 655' X 106' syncrolift capacity.

1/ LEGEND  
Maximum Ship Size

SW = Shipway  
 GD = Graving Dock  
 LL = Lard Level Position  
 SL = Syncrolift

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPE

SHIPYARD	BUILDING POSITION (Number)	General Cargo							Dry Bulk		
		Gen. Cargo 475 X 68	Mob. Cargo 724 X 106	Container 610 X 90	RO/RO 684 X 102	LASH 893 X 100	Container 947 X 106	21,300 570 X 75	51,000 600 X 105	100,000 900 X 106	
Todd-San Francisco	550 X 96SW	1/1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	
Todd-Seattle	600 X 96SW	1/1	0/0	0/0	0/0	0/0	0/0	1/1	0/0	0/0	
Triple A Hunters Point	705 X 82GD	1	0	0	0	0	0	1	0	0	
	986 X 108GD	2	1	1	1	1	1	1	1	1	
	1088 X 138GD	4/7	1/2	1/2	1/2	1/2	1/2	2/4	1/2	1/2	
<u>GREAT LAKES</u>											
Bay SB Corp.	1000 X 136GD	2	1*	1*	1*	1*	1*	1	1*	1*	
	730 X 105SW	1/3	1*/2	1*/2	1*/2	0/1	0/1	1/2	1*/2	0/1	
Fraser Shipyards	825 X 82GD	1/1	0/0	0/0	0/0	0/0	0/0	1/1	0/0	0/0	
The Toledo Shipyard	540 X 68GD 680 X 78GD	0 1/1	0/0 0/0	0/0 0/0	0/0 0/0	0/0 0/0	0/0 0/0	0/0 0/0	0/0 0/0	0/0 0/0	

\* (NOTE: Maximum size ship that can exit the St. Lawrence Seaway is 730' X 78'.)

1/ LEGEND  
Maximum Ship Size

SW = Shipway  
 GD = Graving Dock  
 LL = Land Level Position  
 SL = Syncrolift

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPE

		Tankers										OBO
SHIPYARD	BUILDING POSITION (Number)	25,000	38,000	89,000	120,000	125,000 Cu.m.	225,000	265,000			80,000	160,000
		620 X 75	688 X 90	894 X 105	920 X 138	932 X 140	1100 X 140	1100 X 178			886 X 106	998 X 143
<b><u>EAST COAST</u></b>												
Bath Iron Works	650 X 88SW (2) 700 X 130SW	1 2 3	0 2 2	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Bethlehem Steel, Sparrows Point	800 X 106SW 800 X 95SW 1200 X 192GD	1 1 3 5	1 1 2 4	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1	0 0 1 1
Coastal Drydock	755 X 102GD 717 X 110GD (2) 1082 X 141GD	1 1 2 4	1 1 2 4	0 0 2 2	0 0 2 2	0 0 2 2	0 0 2 2	0 0 2 2	0 0 2 2	0 0 2 2	0 0 2 2	0 0 0 0
General Dynamics, Quincy	(2) 860 X 123GD 936 X 143GD (2) 860 X 144GD	2 1 2 5	2 1 2 5	2 1 2 5	0 1 0 1	0 1 0 1	0 0 0 0	0 0 0 0	0 0 0 0	0 1 0 1	0 1 0 1	0 0 0 0
Newport News	649 X 93SW 715 X 93SW 960 X 124GD 1100 X 130GD 1600 X 246GD	1 1 1 1 6 10	0 1 1 1 4 7	0 0 1 1 2 4	0 0 0 1 1 2	0 0 0 1 1 2	0 0 0 1 1 2	0 0 0 1 1 2	0 0 0 1 1 2	0 0 1 1 1 2	0 0 1 1 1 2	0 0 0 0 1 1

1/ LEGEND  
Maximum Ship Size

SW = Shipway  
 GD = Graving Dock  
 LL = Land Level Position  
 SL = Syncrolift

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPE

SHIPYARD	BUILDING POSITION (Number)	Tankers										OBO		
		25,000 620 X 75	38,000 688 X 90	89,000 894 X 105	120,000 920 X 138	125,000 C.U.M. 932 X 140	225,000 1100 X 140	265,000 1100 X 178	80,000 896 X 106	160,000 998 X 143				
Norfolk SB & DD	475 X 85SW	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Penn Ship	(2) 825 X 136SW 700 X 195LL 1000 X 195LL	2/1	1/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1
<u>GULF CONST</u>														
ADDSCO	(4) 523 X 90SW 620 X 105SW	0/1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Avondale	(2) 1020 X 175LL (3) 1200 X 126LL	3/5	4/4	2/6	2/2	2/2	1/1	1/1	1/1	1/1	1/1	2/4	4/3	6/4
Bethlehem, Beaumont	800 X 96SW	1/1	1/1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Halter Marine, Chickasaw	550 X 75SW	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0



1/ LEGEND  
Maximum Ship Size

SW = Shipway  
 GD = Graving Dock  
 LL = Land Level Position  
 SL = Synrolift

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPE

SHIPYARD	BUILDING POSITION (Number)	Tankers										OBO		
		25,000 620 X 75	38,000 688 X 90	89,000 894 X 105	120,000 920 X 138	125,000 Cu.m. 932 X 140	225,000 1100 X 140	265,000 1100 X 178	80,000 886 X 106	160,000 998 X 143				
Litton/Ingalls E. & W. Banks	690 X 85SW	1	0	0	0	0	0	0	0	0	0	0	0	0
	550 X 80SW	0	0	0	0	0	0	0	0	0	0	0	0	0
	(4) 650 X 90SW	4	0	0	0	0	0	0	0	0	0	0	0	0
	(5) 1000 X 225LL *	17	16	0	0	0	0	0	0	0	0	0	0	0
	1500 X 200LL *	6	2	0	0	0	0	0	0	0	0	0	0	0
		28	18	0	0	0	0	0	0	0	0	0	0	0
Marathon, Brownsville	1100 X 150SW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/0	0/0	1/1	1/1
Tampa Shipyards	(2) 746 X 121GD	2/2	2/2	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Todd-Galveston	475 X 85SW	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
<u>WEST CONST</u> Gunderson, Inc.	800 X 130SW	1/1	1/1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

\* Ship size constrained by maximum launching capability of 850' X 173' vessels.

1/ LEGEND  
Maximum Ship Size

SW = Shipway  
 GD = Graving Dock  
 LL = Land Level Position  
 SL = Syncrolift

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPE

SHIPYARD	BUILDING POSITION (Number)	Tankers										OBO
		25,000 620 X 75	38,000 894 X 90	89,000 920 X 105	120,000 920 X 138	125,000 Cu.m. 932 X 140	225,000 1100 X 140	265,000 1100 X 178	80,000 886 X 106	160,000 998 X 143		
Lockheed	(2) 650 X 88SW 690 X 90SW	2 1 3	0 1 1	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Marine Power & Equipment	(2) 500 X 104SW	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
National Steel & Shipbuilding Co.	690 X 90SW (2) 900 X 106SW 980 X 170GD	1 2 2 5	1 2 1 4	0 2 1 3	0 0 1 1	0 0 1 1	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 1 1	0 0 0 0
Portland SRV	475 X 100SW	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
Tacoma Boat	650 X 400SW	1 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
Todd-LA	(2) 725 X 87SW 826 X 106LL * 545 X 120LL *	2 2 4	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0

\* Ship size constrained by 655' X 106' syncrolift capacity.

1/ LEGEND  
Maximum Ship Size

SW = Shipway  
 CD = Craving Dock  
 LL = Lard Level Position  
 SL = Syncrolift

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPE

		Tankers										OBO	
SHIPYARD	BUILDING POSITION (Number)	25,000	38,000	89,000	120,000	125,000 Cu.m.	225,000	265,000				80,000	160,000
		620 X 75	688 X 90	894 X 105	920 X 138	932 X 140	1100 X 140	1100 X 178				886 X 106	998 X 143
Todd-San Francisco	550 X 96SW	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	
Todd-Seattle	600 X 96SW	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	
Triple A Hunters Point	705 X 82GD	1	0	0	0	0	0	0	0	0	0	0	
	986 X 108GD	1	1	1	0	0	0	0	0	0	1	0	
	1088 X 138GD	2/4	1/2	1/2	0/0	0/0	0/0	0/0	0/0	0/0	1/2	0/0	
<u>GREAT LAKES</u>													
Bay SB Corp.	1000 X 136GD	1	1*	1*	0	0	0	0	0	0	0	1*	0
	730 X 105SW	1/2	1*/2	0/1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/1	0/0
Fraser Shipyards	825 X 82GD	1/1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	
The Toledo Shipyard	540 X 68GD 680 X 78GD	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	

\* (NOTE: Maximum size ship that can exit the St. Lawrence Seaway is 730' X 78'.)

1/ LEGEND

Maximum Ship Size

- SW = Shipway
- GD = Graving Dock
- LL = Laid Level Position
- SL = Syncrolift

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPE

SUMMARY

REGION	General Cargo										Dry Bulk	
	Gen. Cargo 475 X 68	Mob. Cargo 724 X 106	Container 610 X 90	RO/RO 684 X 102	LASH 893 X 100	Container 947 X 106	21,300 570 X 75	51,000 600 X 105	100,000 900 X 106			
EAST COAST	46	19	32	26	9	8	34	24	8			
GULF COAST	58	26	35	27	7	6	44	28	6			
WEST COAST	29	7	11	6	5	3	19	9	5			
GREAT LAKES	5	2	2	2	1	1	3	2	1			
<b>TOTAL POSITIONS - ALL YARDS</b>	<b>138</b>	<b>54</b>	<b>80</b>	<b>61</b>	<b>22</b>	<b>18</b>	<b>100</b>	<b>63</b>	<b>20</b>			

REGION	Tankers										OBO	
	25,000 620 X 75	38,000 688 X 90	89,000 894 X 105	120,000 920 X 138	125,000 Cu.m. 932 X 140	225,000 1100 X 140	265,000 1100 X 178	80,000 886 X 106	160,000 998 X 143			
EAST COAST	31	26	13	7	7	5	3	9	3			
GULF COAST	41	29	7	3	3	2	0	7	5			
WEST COAST	18	8	5	1	1	0	0	3	0			
GREAT LAKES	3	2	1	0	0	0	0	1	0			
<b>TOTAL POSITIONS - ALL YARDS</b>	<b>93</b>	<b>65</b>	<b>26</b>	<b>11</b>	<b>11</b>	<b>7</b>	<b>3</b>	<b>20</b>	<b>8</b>			

TABLE 2

MAJOR U.S. PRIVATE SHIPYARDS  
NUMBER OF SHIPBUILDING WAYS BY LENGTH  
(MAXIMUM SHIP SIZE)

TABLE 2

MAJOR U.S. PRIVATE SHIPBUILDING FACILITIES

NUMBER OF BUILDING WAYS BY LENGTH (MAXIMUM SHIP SIZE) \*

Length OA (In Feet):	475	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1300	1400	1600	
<u>EAST COAST</u>																			
Bath Iron Works	3	3	3	3	2														
Beth-Sparrows Point	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1				
Coastal Drydock	4	4	4	4	4	3	2	2	2	2	2	2							
General Dynamics, E. Boat **																			
General Dynamics, Quincy	5	5	5	5	5	5	5	5	1										
Newport News SB & ID	5	5	5	4	4	3	3	3	3	3	2	2	2	1	1	1	1	1	1
Norfolk SB & ID	1																		
Penn Ship (formerly Sun)	4	4	4	4	4	3	3	1	1	1	1								
TOTAL	(25)	(24)	(24)	(23)	(22)	(17)	(16)	(12)	(8)	(7)	(6)	(5)	(3)	(2)	(2)	(1)	(1)	(1)	(1)
<u>GULF COAST</u>																			
ADDSCO Industries	5	1	1																
Avondale Shipyards	5	5	5	5	5	5	5	5	5	5	5	3	3	3	3				
Beth-Beaumont	1	1	1	1	1	1	1												
Halter Marine-Chickasaw	1	1																	
Ingalls-E. & W. Banks	12	12	11	11	6	6	6	6											
Marathon LeBourneau	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
Tampa Shipyards	2	2	2	2	2	2													
Todd-Calveston	1																		
TOTAL	(28)	(23)	(21)	(20)	(15)	(13)	(13)	(12)	(6)	(6)	(6)	(4)	(4)	(3)	(3)				

\* Including Basins.

\*\* Engaged exclusively in U.S. Navy submarine construction.

TABLE 2

MAJOR U.S. PRIVATE SHIPBUILDING FACILITIES

Length OA (In Feet):	NUMBER OF BUILDING WAYS BY LENGTH (MAXIMUM SHIP SIZE) *																		
	475	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1300	1400	1600	
<u>WEST COAST</u>																			
Gardner, Inc.	1	1	1	1	1	1	1												
Lockheed Shipbuilding	3	3	3	3															
Marine Power & Equip.	2																		
National Steel & SB	4	4	4	4	3	3	3	3	3	1									
Portland Ship Repair	1																		
Tacoma Boat	1	1	1	1															
Todd-Los Angeles	5	4	4	4	3	1	1												
Todd-SF (formerly Betn)	1	1																	
Todd-Seattle	1	1	1																
Triple A-SF	3	3	3	3	3	2	2	2	2	2	1	1							
TOTAL	(22)	(18)	(17)	(16)	(10)	(7)	(7)	(5)	(5)	(3)	(1)	(1)							
<u>GREAT LAKES **</u>																			
Bay SB Corporation	2	2	2	2	2	1	1	1	1	1	1	1							
Fraser Shipyards	2	2	2	1	1	1	1												
Toledo Shipyard	2	1	1	1															
TOTAL	(6)	(5)	(5)	(4)	(3)	(2)	(2)	(1)	(1)	(1)	(1)	(1)	(1)						
GRAND TOTAL ALL	(81)	(70)	(67)	(63)	(50)	(39)	(38)	(30)	(20)	(17)	(14)	(11)	(8)	(5)	(5)	(1)	(1)	(1)	(1)

\* Including Basins.

\*\* Maximum size ship that can exit St. Lawrence Seaway Locks is 730' X 78'.

APPENDIX A

STANDARD FORM 17

FACILITIES AVAILABLE FOR THE CONSTRUCTION  
OR REPAIR OF SHIPS





SHIPS' BERTHS (PIERS, WHARVES, BULKHEADS, MOORING DOLPHINS (M.L.W.))												
NO.	TYPE	LENGTH (Actual and usable)	WATER DEPTH		HEIGHT OF DOCK	USE REPAIR AND/OR OUTFITTING	SERVICE AVAILABLE (Use abbreviations of services and units of measure notated under legend)	CRANES SERVING BERTHS, ETC.		LIFT CAPACITY (Standard tons)		
			Inboard	Outboard				No.	Type (Hook height above M.L.W.)			
DOCK NO.	MATERIAL CONSTD. OF—TYPE		MAXIMUM SHIP SIZE ACCOMMODATED LENGTH OA-BEAM		LENGTH			CLEAR WIDTH		DEPTH/DRAFT		LIFTING CAPACITY (Ton 2,240 lbs.)
	Floating—(FD); Graving—(GD); Marine Railway—(MR)		Overall	At coping (GD); on porticoes (FD)	At keel blocks; on cradle (MR)	At top; cradle (MR)	At keel blocks	Over all (GD)	Over floor	Over keel blocks		
		Act. .... Use. ....									Lift ..... Reach .....	
		Act. .... Use. ....									Lift ..... Reach .....	
		Act. .... Use. ....									Lift ..... Reach .....	
		Act. .... Use. ....									Lift ..... Reach .....	
		Act. .... Use. ....									Lift ..... Reach .....	
		Act. .... Use. ....									Lift ..... Reach .....	
		Act. .... Use. ....									Lift ..... Reach .....	
		Act. .... Use. ....									Lift ..... Reach .....	
		Act. .... Use. ....									Lift ..... Reach .....	
DRYDOCKS (mean HIGH water) (List building docks under building ways)												

LEGEND: (Abbreviations of Services)  
 Fresh water..... F.W.-G.P.M.-P.S.I.  
 Salt water..... S.W.-G.P.M.-P.S.I.  
 Steam..... S-P/HR-P.S.I.  
 Air..... A-C.F.M.-P.S.I.  
 Electric power..... E-V-AC-AMP  
 Electric power..... E-V-DC-AMP  
 Fire protection..... FR-G.P.M.-P.S.I.  
 Sanitary sewer..... SS-Yrs or No.  
 Sheet 2 of 6

PRINCIPAL SHOPS AND BUILDINGS					WEIGHT OF MATERIAL OR NUMBER AND SIZE OF UNITS PRODUCED PER 8 HOURS (See note)	ALL OTHER SHOPS (List names and dimensions, include mold loft, if any)
NAME OF SHOP OR BUILDING	DIMENSIONS OF SHOP OR BUILDING	MATERIALS PROCESSED (See note)	LARGEST EXIT			
			Width	Height		
Fabricating						
Plate			x x x x	x x x x		
Sheet metal						
Subassembly						
Carpenter			x x x x	x x x x	x x x x x x x	
Woodworking			x x x x	x x x x	x x x x x x x	
Boat assembly or molding						
Machine		x x x x x x	x x x x	x x x x	x x x x x x x	
Electrical		x x x x x x	x x x x	x x x x	x x x x x x x	
Electronic		x x x x x x	x x x x	x x x x	x x x x x x x	
Pipe						
Galvanizing						NOTE.—Indicate materials as steel, aluminum, reinforced plastic, wood, plywood, sheet metal, etc.
Foundry						
Rigger		x x x x x x	x x x x	x x x x		

SHOP OR YARD CRANES (5 tons or over)						STATIONARY, RAIL OR MOBILE				
BRIDGE TYPE			Type			Capacity at reach	Boom length	Height hinge	Area serviced	Hgt. of hook above base at out reach
Cap. (Std. tons)	Max. span	Height of hook	Area/shop serviced	Cap. (Std. tons)	Max. reach					

**MAJOR ITEMS OF MACHINE TOOLS AND EQUIPMENT** (List briefly such of the large items as will indicate the capacities of all important shops in maximum work piece size, e.g.: 30' plate bending rolls, 10' plate shears, 400 ton Hyd. press, 30' plate furnace, engine lathe 36" x 20' b.c., etc.)

**STORAGE SPACE (Sq. ft.) FOR COMPONENTS AND MATERIALS** (Less best storage) (List dimensions for each area, plus type material stored)

<b>RAW STEEL STORAGE (Sq. ft.)</b>		<b>WELDING AND ASSEMBLY (Sq. ft.)</b>	
<b>ACREAGE LEGALLY CONTROLLED</b>			
<b>IN USE</b>	<b>DEVELOPED (including in use)</b>	<b>TOTAL (including undeveloped)</b>	
<b>EXISTING LOCAL ORDINANCES LIMITING PRODUCTIVE USE</b>			
<b>LIMITATIONS IMPOSED BY PROPERTY ZONING CLASSIFICATION</b>			
<b>YARD LAYOUT—PLEASE FURNISH A PLOT PLAN OF YARD OR PLANT, IF AVAILABLE</b>			

PROJECTS UNDER CONSTRUCTION WHICH WILL ALTER NAVIGATIONAL RESTRICTIONS (Specify projects and state effect and estimated completions)

ON WATERFRONT  Yes  No

LOCATION OF PRODUCTION FACILITIES FOR PRODUCTS LISTED IN ITEM 11, OF STD. FORM 129

EMPLOYMENT	CURRENT	CURRENT NO. SHIFTS	MOBILIZATION—SHIFTS
Management, administration			
Professional, engineering			
Professional, technical (All others)			
Production, skilled			
Production, semiskilled			
Production, unskilled			
Nonproduction			
Total		X X X X X X	X X X X

NUMBER OF PRODUCTION PERSONNEL PRESENTLY ENGAGED IN SHIP AND/OR BOAT IN SHIP OR BOAT REPAIR CONSTRUCTION

APPROXIMATE TOTAL EMPLOYMENT OF ALL AFFILIATED CONCERNS ONLY LISTED IN ITEM 8, OF STD. FORM 129 (NOTE—An affiliate is a concern that directly, or indirectly through one or more intermediaries controls, or is controlled by, or is under common control with, the reporting firm. Common ownership of stock by individuals does not in itself, constitute affiliation.)

DISTANCE TO NEAREST RAILROAD CONNECTION

DISTANCE TO NEAREST AIRPORT—IDENTIFY

LARGEST CONVEYANCE AVAILABLE AND MAXIMUM DIMENSIONS OF LOAD, FOR OVERLAND TRANSPORTATION OF FINISHED PRODUCTS (Not to exceed limitations imposed by local ordinances)

NAVIGATIONAL RESTRICTIONS (INDICATE ALL AT M.L.W.)

MINIMUM CHANNEL TO TIDEWATER

MINIMUM HORIZONTAL AND VERTICAL BRIDGE CLEARANCES TO TIDEWATER (Identify structures)

LIMITING LOCK DIMENSIONS TO TIDEWATER (Identify locks)

DESCRIPTION OF TYPES OF WORK NORMALLY SUBCONTRACTED

**PRODUCTION EXPERIENCE** (List at least three of the largest and the most complex ships or boats constructed, indicating (1) date completed, (2) hull length, beam, and molded depth, (3) type propulsion unit (fully described), (4) horsepower, (5) electrical and/or electronic installation, (6) special piping features, (7) size and tensile strength of plates, if steel, or type hull material, if other than steel, (8) special annealing, heat treating, or stress relieving problems encountered, if steel, plus, (9) any other important problems resolved). (NOTE.—If no previous construction experience give detailed description of major conversion or industrial manufacturing work considered comparable to ship or boat construction.)



FLOATING DRYDOCK CHARACTERISTICS SUMMARY

FLOATING DRYDOCK	MAXIMUM LENGTH OF PONTOON	MAXIMUM DEPTH OVER BLOCKS	CLEAR WIDTH BETWEEN WINGWALLS	LIFT CAPACITY (TONS)	NORMAL KEEL BLOCK HEIGHT	A.C. AMPERAGE (60 HZ - 3 Ø) 480V 2400V MAX. ALT. HOTEL (Indus) 13.2KV TEST/CHECK	REMARKS (Indicate orientation of hauling blocks, if end selection can be lowered, and max. length of ship DD can accommodate).



MAJOR U.S. SHIPBUILDING & REPAIR FACILITIES

(VESSELS 400' IN LENGTH AND OVER)

CLASSIFICATION DEFINITIONS

- Shipbuilding: Facilities that are open, having at least one shipbuilding position, either an inclined way, a launching platform, or a building basin--provided that water depth in the channel to the facility itself is at least 12 feet--capable of accommodating a minimum ship size of 475' X 68'. With few exceptions, these shipbuilding facilities are also major repair facilities with drydocking capability.
- Repair (With Drydocking): Drydocking facilities for ships 400' in length and over, provided that water depth in the channel to the facility itself is at least 12 feet. These facilities may also be capable of constructing a vessel smaller than 475' X 68', and/or have drydocks for vessels smaller than 400' in length.
- Topside Repair: Facilities with sufficient berth/pier space for topside repair of ships 400' in length and over, provided that water depth in the channel to the facility itself is at least 12 feet. These facilities may also have drydocks for vessels smaller than 400' in length and/or be capable of constructing a vessel smaller than 475' X 68'.

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	<u>Maximum Ship Size</u> (LOA-Beam) SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	<u>Berths/Piers</u> <u>Usable Length</u> in feet  <u>Longest</u> <u>Total linear</u> feet	<u>Remarks</u>  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>EAST COAST</u> Shipbuilding Yards			
Bath Iron Works Bath, ME	650 X 88 SW (2) 700 X 130 SW 550 X 88 FD	<u>850</u> <u>2200</u>	1/ Construction, conversion and repairs - all types of vessels.  2/ 6,795
Bethlehem Steel Corp. Sparrows Point, MD	800 X 106 SW 800 X 95 SW 1200 X 192 GD	<u>1260</u> <u>3970</u>	1/ Construction and conversion - all types of vessels.  2/ 1,185
Coastal Drydock & Repair Corp. Brooklyn, NY	451 X 72 GD 755 X 102 GD 717 X 110 GD (2) 1082 X 141 GD	<u>1200</u> <u>7700</u>	1/ Ship repairs, overhaul and conversion.  2/ 825 Facilities are part of former Brooklyn Navy Yard and are leased from the City of New York.
General Dynamics Electric Boat Corp. Groton, CT	See 1/.	<u>750</u> <u>3506</u>	1/ Engaged exclusively in construction of submarines for the U.S. Navy.  2/ 24,400
General Dynamics Corp. Quincy SB Division Quincy, MA	(2) 860 X 123 GD 936 X 143 GD (2) 860 X 144 GD	<u>893</u> <u>4600</u>	1/ Construction, conversion and repairs - all types of vessels.  2/ 4,420

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	<u>Maximum Ship Size</u> (LOA—Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	<u>Berths/Piers</u> <u>Usable Length</u> in feet  <u>Longest</u> <u>Total linear</u> feet	<u>Remarks</u>  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>EAST COAST</u> Shipbuilding Yards			
Newport News Shipbuilding & Drydock Company Newport News, VA	649 X 93 SW 715 X 93 SW 960 X 124 GD * 1100 X 130 GD * 646 X 88 GD ** 858 X 102 GD ** 455 X 68 GD ** 521 X 68 GD ** 1600 X 246 GD *	<u>1370</u> <u>13420</u>	1/ Construction, conversion and repairs - all types of vessels.  2/ 30,000  * Used for construction. ** Used for repair and overhaul.
Norfolk Shipbuilding & Drydock Corporation Norfolk, VA	475 X 85 SW 670 X 90 FD 1000 X 155 FD 441 X 60 MR *	<u>1030</u> <u>12170</u>	1/ Ship construction, conversion and repairs - all types of vessels.  2/ 2,770  * Located at Brambleton plant.
Pennsylvania Shipbuilding Co. Chester, PA	(2) 825 X 136 SW 700 X 195 LL 1000 X 195 LL 1100 X 195 FD 400 X 80 FD	<u>1100</u> <u>3900</u>	1/ Ship construction, conversion and repair - all types of vessels.  2/ 1,190

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	Maximum Ship Size (LOA-Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	Berths/Piers Usable Length in feet  Longest Total linear feet	Remarks  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>EAST COAST</u>			
Repair Yards with Drydock Facilities			
Atlantic Drydock Corp. Fort George Island, FL	450 X 76 MR	<u>585</u> 1440	1/ Construction of small vessels. Repair and overhaul of small and medium size vessels.  2/ 320
Bath Iron Works Corp. Portland, ME	1000 X 136 FD	<u>1000</u> 1500	1/ Ship repairs and conversion.  2/ 525
Boston Shipyard Corp. East Boston, MA	533 X 85 FD 690 X 92 FD	<u>1020</u> <u>3111</u>	1/ Construction and repair of all types of marine vessels.  2/ 315
Boston Marine Industrial Park (E.D.I.C.) Boston, MA	1150 X 120 GD	<u>900</u> 2500	1/ Leases public drydock in former Boston Naval Annex to local ship repair companies.  2/ 20
Braswell Shipyards Charleston, SC	570 X 92 FD	<u>720</u> 1080	1/ Ship repairs and conversion.  2/ 320
Colonna's Shipyard, Inc. Norfolk, VA	(2) 400 X 65 MR	<u>900</u> 900	1/ General ship repairs.  2/ 280
Robert E. Derektor of Rhode Island, Inc. Middleton, RI	725 X 90 FD	<u>1500</u> 6500	1/ Construction of Coast Guard ships and vessel repairs.  2/ 925

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	<u>Maximum Ship Size</u> (LOA-Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	<u>Berths/Piers</u> <u>Usable Length</u> in feet  <u>Longest</u> <u>Total linear</u> feet	<u>Remarks</u>  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>EAST COAST</u>			
Repair Yards with Drydock Facilities			
Detyens Shipyard Mt. Pleasant, SC	500 X 85 FD	$\frac{510}{1022}$	1/ General ship repair and conversion.  2/ 350
General Ship Corp. East Boston, MA	690 X 105 GD *	$\frac{900}{2530}$	1/ Ship repairs and overhaul. Construction up to 225' in length.  2/ 350  * GD is long-term leased from Boston Marine Industrial Park in the former Boston Naval Annex.
Hoboken Shipyards, Inc. Bayonne, NJ	1082 X 138 GD *	$\frac{650}{2250}$	1/ Ship repairs, overhaul and conversion.  2/ 390  * Long-term leased from Army Corps of Engineers.
Jacksonville Shipyards Commercial Division Jacksonville, FL	660 X 90 FD 900 X 140 FD 745 X 127 FD	$\frac{800}{4187}$	1/ Ship repair and conversion.  2/ 1,390
Jacksonville Shipyards Bellinger Division Jacksonville, FL	400 X 53 FD 400 X 50 SW 475 X 70 SW	$\frac{600}{2297}$	1/ Construction and repair of small vessels.  2/ 160
Metro Machine Corp. Norfolk, VA	660 X 96 FD	$\frac{785}{2030}$	1/ Ship repairs and conversion.  2/ 515

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	<u>Maximum Ship Size</u> (LOA—Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	<u>Berths/Piers</u> <u>Usable Length</u> in feet  <u>Longest</u> <u>Total linear</u> feet	<u>Remarks</u>  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>EAST COAST</u> Repair Yards with Drydock Facilities			
North Florida Shipyards Jacksonville, FL	500 X 66 FD	<u>1600</u> <u>3390</u>	1/ Ship repairs and conversion.  2/ 590
Perth Amboy Drydock Co. Perth Amboy, NJ	400 X 68 FD 443 X 70 FD	<u>600</u> <u>600</u>	1/ General ship repair and conversion.  2/ 75
Rodermond Industries Brooklyn, NY	700 X 85 GD 775 X 106 FD 425 X 80 FD	<u>1200</u> <u>4600</u>	1/ General ship repairs.  2/ 150

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	<u>Maximum Ship Size</u> (LOA—Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	<u>Berths/Piers</u> <u>Usable Length</u> in feet  <u>Longest</u> <u>Total linear</u> feet	<u>Remarks</u>  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>EAST COAST</u>			
Topside Repair Yards			
Caddell Drydock & Repair Company Staten Island, NY		$\frac{666}{2802}$	1/ General ship repair.  2/ 190
Jonathan Corporation Norfolk, VA		$\frac{775}{1181}$	1/ Ship repair and overhaul.  2/ 750
Metal Trades, Inc. Hollywood, SC		$\frac{260 *}{500}$	1/ General ship repair.  2/ 230  * Can do topside repair to vessel 400' in length.
Moon Engineering Norfolk, VA		$\frac{550}{550}$	1/ General ship repair, primarily for Navy.  2/ 145
Moon Engineering Portsmouth, VA		$\frac{650}{650}$	1/ General ship repairs.  2/ Opened 10-85
Newport Offshore, Ltd. Newport, RI		$\frac{3000}{8300}$	1/ General ship repair.  2/ 240
Promet Marine Services Corp. E. Providence, RI		$\frac{750}{2250}$	1/ General ship repair.  2/ 25

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	<u>Maximum Ship Size</u> (LOA—Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	<u>Berths/Piers</u> <u>Usable Length</u> in feet  <u>Longest</u> <u>Total linear</u> feet	<u>Remarks</u>  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>EAST COAST</u> Topside Repair Yards			
Reynolds Shipyard Corp. Staten Island, NY		$\frac{440}{440}$	1/ General ship repairs.  2/ 35
Rodemond Industries Jersey City, NJ		$\frac{500}{1200}$	1/ General ship repairs.  2/ 10 *  * Labor force transferred from Rodemond, NY.
Tracor Marine, Inc. Port Everglades, FL		$\frac{780}{1305}$	1/ General ship repairs.  2/ 225



MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	<u>Maximum Ship Size</u> (LOA—Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	<u>Berths/Piers</u> <u>Usable Length</u> in feet  <u>Longest</u> <u>Total linear</u> feet	<u>Remarks</u>  <u>1/</u> Type of work usually engaged in  <u>2/</u> Employment - Mid-1985
<u>GULF COAST</u> Shipbuilding Yards			
ADDSCO Industries, Inc. Mobile, AL	(4) 523 X 90 SW 620 X 105 SW 625 X 83 FD 750 X 100 FD	<u>1132</u> <u>9370</u>	<u>1/</u> Ship construction, conversion and repairs. Also drill rig construction.  <u>2/</u> 650
Avondale Shipyards, Inc. New Orleans, LA	(2) 1020 X 175 LL * 1000 X 216 FD * 750 X 110 FD ** (3) 1200 X 126 LL ** 450 X 90 SW ***	<u>2300</u> <u>6100</u>	<u>1/</u> Modular ship construction, conversion, and repairs - all types of vessels.  <u>2/</u> 4,600  * Upper main yard. ** Lower main yard. *** Westwego Plant.
Bethlehem Steel Corp. Beaumont, TX	800 X 96 SW	<u>1000</u> <u>4000</u>	<u>1/</u> Construction of barges and drilling rigs. Also ship repair and conversion.  <u>2/</u> 900
Halter Marine, Inc. Chickasaw Division Chickasaw, AL	550 X 75 SW	<u>1000</u> <u>2100</u>	<u>1/</u> Construction of small and mid-size vessels mainly for offshore oil and gas industry; however, is capable of building deep draft vessels.  <u>2/</u> 45

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	<u>Maximum Ship Size</u> (LOA—Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	<u>Berths/Piers</u> Usable Length in feet  <u>Longest</u> Total linear feet	<u>Remarks</u>  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>GULF COAST</u> Shipbuilding Yards			
Litton/Ingalls Shipbuilding Division Pascagoula, MS	690 X 85 SW 550 X 80 SW (4) 650 X 90 SW 460 X 60 GD 850 X 173 FD * (5) 1000 X 225 LL * 1500 X 200 LL *	<u>2650</u> 9850	1/ Construction, conversion, and repairs - all types of vessels.  2/ 11,550  * West Bank can only launch ships up to 850' X 173'. Land Level Positions constrained by launching capability.
Marathon LeTourneau Co. Brownsville, TX	1100 X 150 SW	<u>600</u> 1100	1/ Construction of drillings rigs. Yard has capability of building large oceangoing ships.  2/ 425
Tampa Shipyards, Inc. Tampa, FL	546 X 72 GD* 896 X 146 GD* (2) 746 X 121 GD**	<u>840</u> 2240	1/ Ship construction, conversion and repairs.  2/ 1,760  * Used for ship repair. ** Used for ship construction.
Todd Shipyards Corp. Galveston, TX	475 X 85 SW 900 X 160 FD 600 X 118 FD	<u>1086</u> 6400	1/ Ship construction, repairs and conversion.  2/ 620

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	Maximum Ship Size (LOA-Beam) SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Berths/Piers Usable Length in feet  <u>Longest</u> Total linear feet	Remarks  <u>1/</u> Type of work usually engaged in  <u>2/</u> Employment - Mid-1985
<u>GULF COAST</u> Repair Yards with Drydock Facilities			
Bender Shipbuilding & Repair Co., Inc. Mobile, AL	660 X 89 FD 414 X 55 FD 414 X 45 FD	<u>617</u> 5000	<u>1/</u> Construction of vessels up to 300' in length. Also repairs and conversion.  <u>2/</u> 590
Bethlehem Steel Corp. Sabine Yard Port Arthur, TX	1100 X 118 FD	<u>900</u> 1900	<u>1/</u> Repair of offshore oil rigs but can repair oceangoing ships.  <u>2/</u> 60
Bludworth Bond Shipyard Houston, TX	435 X 80 FD	<u>530</u> 1500	<u>1/</u> General ship repairs.  <u>2/</u> 150
Gulf-Tampa Drydock Co. Tampa, FL	500 X 97 FD	<u>800</u> 1100	<u>1/</u> Ship repairs and overhaul.  <u>2/</u> 185
Todd Shipyards Corp. New Orleans, LA	643 X 82 FD 643 X 80 FD	<u>1725</u> 3756	<u>1/</u> Ship repairs and conversion.  <u>2/</u> 200

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	<u>Maximum Ship Size</u> (LOA—Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	<u>Berths/Piers</u> <u>Usable Length</u> in feet  <u>Longest</u> <u>Total linear</u> feet	<u>Remarks</u>  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>GULF COAST</u> Topside Repair Yards			
American Marine Corp. New Orleans, LA		$\frac{800}{800}$	1/ Construction of offshore oil vessels and barges.  2/ 250
Boland Marine Manufacturing New Orleans, LA		$\frac{3600}{4702}$	1/ General ship repairs.  2/ 150
Buck Kreihns Co. New Orleans, LA		$\frac{1100}{1100}$	1/ Ship repairs and conversion.  2/ 130
Coastal Iron Works Corpus Christie, TX		$\frac{290}{470}$ *	1/ General ship repair.  2/ 80  * Can do topside repair to vessels 400' in length.
Dixie Machine Welding New Orleans, LA		$\frac{1333}{1333}$	1/ General ship repairs.  2/ 125
Halter Marine, Inc. Equitable Division New Orleans, LA		$\frac{500}{1554}$	1/ Construction and repair of small vessels and barges.  2/ 106
Hendry Corp. Tampa, FL		$\frac{700}{700}$	1/ General ship repairs.  2/ 110

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	<u>Maximum Ship Size</u> (LOA—Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	<u>Berths/Piers</u> <u>Usable Length</u> in feet  <u>Longest</u> <u>Total linear</u> feet	<u>Remarks</u>  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>GULF COAST</u> Topside Repair Yards			
Houston Ship Repair, Inc. (ex. Marine Maintenance) Houston, TX		$\frac{750}{750}$	1/ General ship repair and conversion.  2/ 50
McDermott Shipyard Morgan City, LA		$\frac{600}{1190}$	1/ Construction and repair of tugs, supply boats, barges, and drill rigs.  2/ 370
Newark Shipbuilding Houston, TX		$\frac{500}{1600}$	1/ Small vessel construction and repairs.  2/ 240

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	<u>Maximum Ship Size</u> (LOA-Beam) SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	<u>Berths/Piers</u> <u>Usable Length</u> in feet  <u>Longest</u> <u>Total Linear</u> feet	<u>Remarks</u>  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>WEST COAST</u> Shipbuilding Yards			
Gunderson, Inc. Portland, OR	800 X 130 SW	$\frac{1100}{1100}$	1/ Construction of barges and vessels up to 800' in length.  2/ 25 *  * Due to lack of contracts.
Lockheed Shipbuilding Co. Seattle, WA	(2) 650 X 88 SW 690 X 90 SW 643 X 96 FD	$\frac{698}{6500}$	1/ Ship construction, conversion and repair - all types of vessels.  2/ 2,047
Marine Power & Equipment Yard No. 4 S. Seattle, WA	400 X 57 FD (2) 500 X 104 SW 400 X 100 SL	$\frac{620}{1,505}$	1/ Ship construction, repairs, and conversion.  2/ 125
National Steel & Shipbuilding Co. San Diego, CA	(2) 690 X 90 SW 900 X 106 SW 980 X 170 GD 750 X 130 FD	$\frac{1000}{6800}$	1/ Construction, conversion, and repairs - all types of vessels.  2/ 4,630  Graving dock and piers at U.S. Naval Station also leased, as required.
Portland Ship Repair Yard Portland, OR  Facilities also leased by: 1. Dillingham Ship Repair 2. Northwest Marine Iron 3. Lockport Marine Co.	475 X 100 SW 650 X 84 FD 550 X 88 FD 810 X 108 FD 1150 X 181 FD	$\frac{1000}{9900}$	1/ Ship construction, repair and conversion - all types of vessels.  2/ 2,000

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	<u>Maximum Ship Size</u> (LOA—Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	<u>Berths/Piers</u> Usable Length in feet  <u>Longest</u> Total linear feet	<u>Remarks</u>  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>WEST COAST</u> Shipbuilding Yards			
Tacoma Boatbuilding Tacoma, WA	(2) 425 X 45 SW (2) 430 X 50 SW 650 X 400 SW 540 X 75 FD 420 X 64 FD	<u>1100</u> <u>4200</u>	1/ Ship construction, repairs, and conversion - all types of vessels.  2/ 1,440
'Todd Pacific Shipyards Los Angeles, CA	(2) 725 X 87 SW 826 X 106 LL 545 X 120 LL 408 X 80 FD 711 X 86 FD 655 X 106 SL	<u>700</u> <u>6175</u>	1/ Modular ship construction, conversion, and repairs - all types of vessels.  2/ 2,700
Todd Pacific Shipyards Seattle, WA	600 X 96 SW * 420 X 62 FD 650 X 84 FD 943 X 133 FD	<u>1400</u> <u>6017</u>	1/ Ship construction, repairs, and conversion - all types of vessels.  2/ 975  * Max. ship size is 600' X 96' using two 450' X 50' SWs.
Todd Pacific Shipyards San Francisco, CA	550 X 96 SW 700 X 94 FD 950 X 144 FD	<u>813</u> <u>3200</u>	1/ Barge construction, ship repairs and conversion. Can Build C3 and C4 type vessels.  2/ 450
Triple A Shipyards Hunters Point San Francisco, CA	705 X 82 GD 986 X 108 GD 1088 X 138 GD (2) 416 X 56 GD 416 X 71 GD	<u>1390</u> <u>24000</u>	1/ Ship repairs, overhaul, and conversion.  2/ 480  All graving docks are part of inactive Hunters Point Naval Shipyard and are leased from the Navy.

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	Maximum Ship Size (LOA—Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	Berths/Piers Usable Length in feet  Longest Total linear feet	Remarks  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>WEST COAST</u>			
Repair Yards with Drydock Facilities			
Continental Maritime of San Francisco, Inc. San Francisco, CA	750 X 138 FD	$\frac{1100}{4100}$ *	1/ Ship repair and conversion. 2/ 250  * Pier space long-term leased from San Francisco Port Commission.
Marine Power & Equipment Yard No. 1 N. Seattle, WA	400 X 60 FD	$\frac{360}{510}$	1/ General ship repairs. 2/ 125
Pacific Drydock & Repair Co. Oakland, CA	400 X 52 FD	$\frac{600}{1155}$	1/ Ship and barge repairs. 2/ 100
Southwest Marine, Inc. San Diego, CA	655 X 104 FD	$\frac{700}{1722}$	1/ Ship repairs, overhaul, and conversion. 2/ 520  Graving dock at Naval Station can be leased as required.
Southwest Marine, Inc. Terminal Island San Pedro, CA	720 X 93 FD	$\frac{1500}{4175}$	1/ Ship repairs, overhaul, and conversion. 2/ 450
Southwest Marine of San Francisco San Francisco, CA	400 X 54 FD	$\frac{700}{1500}$	1/ Ship repairs and overhaul. 2/ 200



MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	Maximum Ship Size (LOA—Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	Berths/Piers Usable Length in feet  Longest Total linear feet	Remarks  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>WEST COAST</u> Repair Yards with Drydock Facilities			
Triple A South San Diego, CA	400 X 53 FD	*	1/ Ship repairs and overhaul.  2/ 260  * Graving dock and piers at Naval Station can be leased as required.
U.S. Naval Station San Diego, CA	687 X 85 GD	N.A. 13000	1/ Facilities leased to following ship repair companies as well as others previously noted: a/ Arowel Corporation b/ Continental Maritime of San Diego c/ RML, Inc.  2/ N/A

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	<u>Maximum Ship Size</u> (LOA—Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	<u>Berths/Piers</u> <u>Usable Length</u> in feet  <u>Longest</u> <u>Total linear</u> feet	<u>Remarks</u>  1/ Type of work usually engaged in  2/ Employment - Mid-1985
WEST COAST Topside Repair Yards			
Campbell Industries San Diego, CA		640 2280	1/ General ship repair and construction of vessels up to 300' in length.  2/ 200
Kaiser Steel Corp. Napa, CA		500 500	1/ Heavy steel fabrication and erection. Construction and repair of small ships and barges.  2/ 200
Lake Union Drydock Seattle, WA		1000 4235	1/ Ship repair and conversion.  2/ 195
Larson Boat Shop Terminal Island, CA		400 600	1/ Ship and boat repair.  2/ 125
Pacific Fishermen, Inc. Seattle, WA		500 1300	1/ Construction and repair of small vessels. Topside repair of large vessels.  2/ 40
Service Engineering Co. San Francisco, CA		906 1812	1/ General ship repair and conversion.  2/ 150

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	Maximum Ship Size (LOA—Beam)	Berths/Piers Usable Length in feet	Remarks
	SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	Longest Total linear feet	

GREAT LAKES

Maximum ship size that can exit the St. Lawrence Seaway locks is 730' X 78'.)

<u>Shipbuilding Yards</u>			
Bay Shipbuilding Corp. Sturgeon Bay, WI	730 X 105 SW 640 X 66 FD 1100 X 136 GD	$\frac{1000}{7090}$	<u>1/</u> Ship construction, repairs, and conversion.  <u>2/</u> 589
Fraser Shipyards Superior, WI	825 X 82 GD 620 X 61 GD	$\frac{900}{4450}$	<u>1/</u> Ship construction, repairs, and conversion.  <u>2/</u> 85
The Toledo Shipyard * Toledo, OH	540 X 68 GD 680 X 78 GD	$\frac{800}{1610}$	<u>1/</u> Ship construction, repair, and conversion.  <u>2/</u> (Opened 9-85)  * Leased by Merce Industries, Inc.
<u>Repair Yards with Drydock Facilities</u>			
NONE			
<u>Topside Repair Yards</u>			
Marinette Marine Corp. Marinette, WI		$\frac{2136}{2136}$	<u>1/</u> Ship construction, repair, and conversion.  <u>2/</u> 730
Peterson Builders Sturgeon Bay, WI		$\frac{900}{2515}$	<u>1/</u> Ship construction, repair, and conversion.  <u>2/</u> 950

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES  
(Vessels 400' in Length and Over)

Name and Location	Maximum Ship Size (LOA—Beam) SW—Shipway GD—Graving Drydock FD—Floating Drydock MR—Marine Railway LL—Land Level Position SL—Syncrolift	Berths/Piers Usable Length in feet  Longest Total linear feet	Remarks  1/ Type of work usually engaged in  2/ Employment - Mid-1985
<u>NON-CONUS</u> <u>Shipbuilding Yards</u>  NONE			
<u>Repair Yards with Drydock Facilities</u>  Honolulu Shipyard, Inc. Honolulu, HI	400 X 54 FD	$\frac{600}{600}$	1/ General ship repair and overhaul.  2/ 120
Puerto Rico Drydock & Marine Terminals San Juan, PR	632 X 80 GD	$\frac{1000}{3300}$	1/ General ship repairs.  2/ 80
<u>Topside Repair Yards</u>  NONE			



