



Great Lakes Dredge & Dock Company

Great Lakes
Dredge & Dock
Company

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The dredge Chicago, the largest bucket dredge in the Great Lakes fleet, reflects the company's commitment to design and construction of the finest dredging equipment. She is the most efficient clamshell (grab)dipper dredge in the world.

Great Lakes Dredge & Dock Company is the Western Hemisphere's leading dredging and marine construction company. Great Lakes' fleet of hydraulic cutterhead, clamshell, dipper, trailing suction hopper dredges, drillboats and attendant plant is valued in excess of US\$700 million, and is the largest in the U.S.

The company has eight division offices and maintains five marine yard facilities.

Great Lakes has a number of subsidiaries, including:

- **North American Trailing Company (NATCO)** is the nation's largest trailing suction hopper dredging organization, with a fleet of five dredges.
- **Gates Construction Corp.**, a leading marine construction firm based in the New York City area with operations throughout the Eastern Seaboard of the United States. Gates has been involved in virtually every major pipeline crossing in the Northeast since 1960.
- **Grant Dredging Co.**, a dredging subsidiary with operations addressing the maintenance of navigation in U.S. inland waterways.
- **Amboy Aggregates Co.**, a supplier of aggregate materials in the Northeastern U.S. market. McCormack mines sand offshore with the trailing suction hopper dredge Sandy Hook, and processes the sand in its South Amboy, New Jersey, plant. It is one of the largest aggregate suppliers in the U.S.
- **Great Lakes Transport & Towing** moves vessels and materials through Northeastern and Great Lakes ports, with special emphasis on the transport of aggregates. GLT&T's operation is headquartered in West Nyack, N.Y.
- **Lydon Dredging & Construction Co., Ltd.**, a Canadian dredging subsidiary, has been involved in numerous projects in Canadian waters.

Great Lakes Dredge & Dock Company



Areas of Activity

Dredging is a specialized field that can involve the removal of a full range of natural underwater materials—silts, clays, sands and rock formations. Great Lakes applies its dredging expertise to:

- Deepen and maintain waterways, shipping channels and ports.
- Create and renourish beaches.
- Excavate harbors and build docks, terminals and piers.
- Reclaim land.
- Restore aquatic and wetland habitats.
- Excavate pipeline, cable and tunnel trenches.
- Build jetties, levees and revetments.

In recent years, Great Lakes has performed approximately 60 percent of all new work projects annually contracted by the U.S. Army Corps of Engineers, the agency responsible for navigable waterways in the United States.

In its hundred years of business, the company has never failed to complete a contracted project. Additionally, Great Lakes' financial position enables the company to obtain all necessary bonding and sureties.

Rock Dredging: In this area of special capability, Great Lakes leads the industry, and has been involved in virtually all major submarine rock excavation projects undertaken in the United States.

Beach Nourishment: Great Lakes has restored more eroded recreational and commercial waterfronts than any other U.S. company, making it the leader in this important field.

Marine Construction: Great Lakes and Gates Construction build docks, piers, trestles, bridges, and breakwaters, and lay underwater pipelines.

International Operations: The company has undertaken dredging and construction contracts in Saudi Arabia, Oman, Iran, the United Arab Emirates, Kenya, the Netherlands Antilles, Trinidad, Argentina, Colombia, Venezuela, Panama, El Salvador, St. Lucia, and Canada.

Photos: 1) Hydraulic cutterhead dredge California 2) Clamshell (grab) Dredge No. 53 3) Trailing suction hopper dredges Dodge Island, Sugar Island, and Manhattan Island 4) Entrance channel at Jebel Ali, U.A.E. 5) Drillboat No. 8 6) Restored beach at Ocean City, Maryland 7) Construction of Pier J at Long Beach Harbor 8) Trailing suction hopper dredge Long Island

History

Founded in 1890 as the partnership of William A. Lydon & Fred C. Drews, Great Lakes Dredge & Dock Co. was incorporated under its present name in 1905.

In our earliest years, we excavated intakes and outfalls for Chicago's water distribution system. We were prime contractor for the building of the Michigan Avenue Bridge, and most of the principal landmarks on the Chicago shoreline are on land or foundations put in place by Great Lakes. In one of the earliest and largest landfills in U.S. history, we expanded the Chicago shoreline along a 13-mile front.

The company's stock was publicly traded on the Midwest Stock Exchange starting in 1920.

During World War II, the firm constructed the MacArthur Lock at Sault Ste. Marie, and dredged for graving docks on the East Coast for the construction of the U.S. Navy's *Missouri* class of battleships.

Great Lakes did much of the stateside dredging at the time of the opening of the St. Lawrence Seaway, increasing the capability of ports on the Great Lakes to accommodate large cargo vessels.

During the 1970s, we were instrumental in the privatization of the trailing suction hopper dredging industry in America, starting with the construction of the *Manhattan Island* class of self-propelled trailing suction hopper dredges. All told, Great Lakes invested over \$100 million in trailing suction hopper dredge development and construction in the 1970s and 80s.

International expansion also came during this era, as the company took on many assignments abroad.

In 1971, the company's stock was listed on the New York Stock Exchange. In 1985, Great Lakes' stock was bought by Chicago-based Irel Corporation, and in 1991 was purchased by the Blackstone Investment Group, of New York. The company operates as an autonomous Blackstone subsidiary.

The company has been responsible for much of the work in fulfillment of the provisions of the Water Resources Development Act of 1986, with expansion and deepening projects undertaken at ports on all American coasts. This work includes the Kill Van Kull Project in New York Harbor, the largest dredging contract ever let by the U.S. Army Corps of Engineers.



Fleet

All of the company's major equipment has ABS loadline and U.S. Coast Guard certification for ocean work. The fleet is comprised of 30 dredges: the hydraulic cutterhead dredges *Alaska, California, Carolina, Florida, Georgia, Illinois, Louisiana, America, Columbus* and *Rhode Island*, the trailing suction hopper dredges *Dodge Island, Long Island, Manhattan Island, Northerly Island, Padre Island, Sugar Island*, and *Sandy Hook*, the dipper dredge *Mogul*, the convertible clamshell (grab)/dipper dredges *Chicago* and *Boston*, and clamshell *Dredges No. 50, 51, 52, 53, 54, 55, 56, Cranes No. 1 and 2*, and *Conical*. Additionally, we operate three drillboats, 60 tugs and launches, 48 dump and hopper scows, and numerous other pieces of specialized plant.



Great Lakes Dredge & Dock Company

DIVISIONS

Administrative Division

2122 York Road
Oak Brook, Illinois 60521
Telephone 708/574-3000
Fax 708/574-2909

International Division

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Fax 708/574-2909

North Atlantic Division

2747 Richmond Terrace
Staten Island, New York 10303
Telephone 718/981-2700
Fax 718/727-5174

South Atlantic Division

225 International Circle
Hunt Valley, Maryland 21030
Telephone 410/771-0680
Fax 410/771-0686

Southern Division

9218 Cypress Green Dr.
Jacksonville, Florida 32256
Telephone 904/737-2739
Fax 904/737-1815

Gulf Coast Division

3850 North Causeway Blvd.
Suite 1830
Metairie, Louisiana 70002
Telephone 504/832-4290
Fax 504/832-4277

Great Lakes Division

1250 Old River Rd.
Cleveland, Ohio 44113
Telephone 216/241-0870
Fax 216/651-3517

Pacific Division

2100 Embarcadero, Suite 205
Oakland, California 94606
Telephone 510/436-0663
Fax 510/436-7852

Marine Construction Group

2122 York Road
Oak Brook, Illinois 60521
Telephone 708/574-3000
Fax 708/574-2909

SUBSIDIARIES

North American Trailing Co.

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Telephone 708/574-3000
Fax 708/574-3472

Amboy Aggregates

415 Main St.
South Amboy, New Jersey 08879
Telephone 201/525-0620
Fax 201/727-0304

Gates Construction Corp.

208 Gates Rd.
Little Ferry New Jersey 07643
Telephone 201/342-4660
Fax 201/440-5065

Great Lakes Transport & Towing

162 Old Mill Road
West Nyack, New York 10994
Telephone 914/353-4490
Fax 914/353-0012

Grant Dredging Co.

P.O. Box 136
Flinthill, Missouri 63346
Telephone 314/639-1880
Fax 314/639-1879

Registered in Hong Kong, Singapore, Australia, Argentina, Saudi Arabia and Canada

Marine yard facilities are maintained in Baltimore, Maryland; Morgan City, Louisiana.; Staten Island, New York; and Green Cove Springs, Florida



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North American Trailing Company



A Trio: The Manhattan Island, Sugar Island, and Dodge Island at work together at the entrance to Kings Bay, Georgia.

North American Trailing Company, a Great Lakes subsidiary, was established when the U.S. Government opened the trailing suction hopper dredging market to private operators. All of the five dredges of the NATCO fleet were built over a seven-year period, and incorporate the split-hull design, an innovation that had earlier proved successful in Great Lakes' material barge fleet. The *Dodge Island*, *Sugar Island* and *Northerly Island* feature integral pump-out systems.

This versatile fleet has proved useful in the following applications:

- New harbor development and improvement
- Maintenance of channels and harbors
- Beach nourishment
- Land reclamation
- Aggregates mining
- Shallow dredging
- Capping of contaminated disposal sites
- Construction of offshore and nearshore berms

The NATCO Fleet

IMPERIAL

| Dredge | Hopper Capacity (yd ³) | Discharge Diameter (in) | Nominal Digging Depth (ft) | Total Installed Power (hp) |
|-------------------------|------------------------------------|-------------------------|----------------------------|----------------------------|
| <i>Dodge Island</i> | 3,600 | 24 | 70+ | 9,395 |
| <i>Sugar Island</i> | 3,600 | 24 | 70+ | 9,395 |
| <i>Padre Island</i> | 3,600 | 24 | 70+ | 7,530 |
| <i>Manhattan Island</i> | 3,600 | 24 | 70+ | 7,085 |
| <i>Northerly Island</i> | 2,160 | 18 | 50+ | 4,915 |

METRIC

| Dredge | Hopper Capacity (m ³) | Discharge Diameter (mm) | Nominal Digging Depth (m) | Total Installed Power (kW) |
|-------------------------|-----------------------------------|-------------------------|---------------------------|----------------------------|
| <i>Dodge Island</i> | 2,750 | 610 | 21.3+ | 7,010 |
| <i>Sugar Island</i> | 2,750 | 610 | 21.3+ | 7,010 |
| <i>Padre Island</i> | 2,750 | 610 | 21.3+ | 5,620 |
| <i>Manhattan Island</i> | 2,750 | 610 | 21.3+ | 5,290 |
| <i>Northerly Island</i> | 1,650 | 460 | 15.2+ | 3,670 |

North American Trailing Company



*A Split-Hull Fleet: 1) Dodge Island 2) Sugar Island
3) Padre Island 4) Manhattan Island 5) Northerly Island*



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Gates Construction Corp.



Ringer and derricks position caps atop pilings for the ammunition pier and trestle erected for the U.S. Navy at Colts Neck, New Jersey.

Since its establishment in 1950, Gates Construction Corp. has become a major marine contractor on the East Coast.

Acquired in 1991, Gates' construction skills augment Great Lakes' dredging capabilities to enable pursuit of a wider variety of projects as a single dredging/construction contractor. When Great Lakes functions as a subcontractor, this enhanced capacity allows the company to cover all types of marine construction projects as an economic and convenient alternative to the use of two separate business units.

Areas of Construction Activity

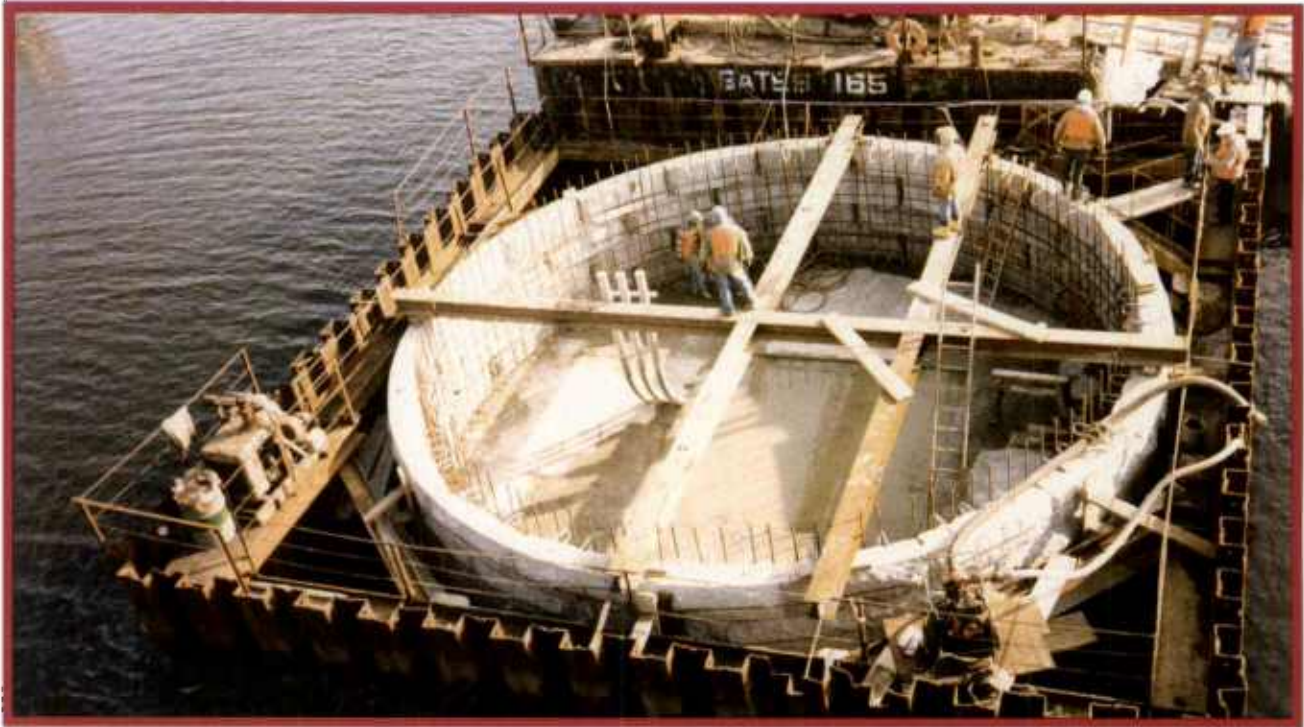
- Bridges
- Cofferdams, pilings, foundations
- Piers and bulkheads
- Jetties
- Pipeline and cable crossings
- Ocean outfalls
- Pipe and cable repairs

The company's equipment inventory includes nine tugs, a dredge, a jack-up barge, 22 barges, and 40 pieces of land equipment, including cranes, dozers, pile-driving equipment and front-end loaders. The company maintains yards in Little Ferry, New Jersey, and Staten Island, New York.



Gates' jack-up barge provides a stable platform for heavy lift and other work.

Gates Construction Corp.



A cofferdam was required for the work to replace a swing railway bridge over the Mystic River in Connecticut.

Selected Completed Construction Projects

| Customer | Description | Location | Value (US\$) |
|-----------------------------------|---|--------------------------------|--------------|
| Consolidated Edison, New York | 13-mile oil static pipeline | Long Island Sound | 16,000,000 |
| Sussex County, Delaware | 30-inch-diameter ocean outfall | Georgetown, Delaware | 7,880,000 |
| Suffolk County, New York | 72-inch-diameter ocean outfall | Suffolk County, New York | 28,780,000 |
| U.S. Navy Submarine Command | Submarine berthing pier | Groton, Connecticut | 5,634,000 |
| City of New York | Marine transfer station | Brooklyn, New York | 25,000,000 |
| Public Service Electricity & Gas | Cooling tower pile foundations | Delaware Bay, New Jersey | 7,648,000 |
| National Railroad Passenger Corp. | Bridge replacement | Mystic, Connecticut | 14,977,000 |
| New York City Public Development | South Street Seaport | New York, New York | 5,260,000 |
| Orange & Rockland Utilities | Sheeting, piling and masonry | Hanover, New Jersey | 8,165,000 |
| U.S. Navy | Ammunition pier and causeway trestle | Coltsneck, New Jersey | 43,836,500 |
| U.S. Army Corps of Engineers | Jetty repair | Moriches, New York | 8,317,500 |
| U.S. Army Corps of Engineers | Pedestrian walkway bridge | Liberty State Park, New Jersey | 12,710,000 |
| City of New York | 24-inch-diameter water main crossing | Bowery Bay, New York | 7,053,000 |
| City of New York | Rehabilitation of bulkhead wall | Brooklyn, New York | 5,011,000 |
| State of New Jersey | Interstate highway bridge | Bordentown, New Jersey | 11,373,000 |
| New York City | Fishing pier improvements | Brooklyn, New York | 5,195,000 |
| New York City | 30-inch, 3,200 ft horizontal water main | New York, New York | 12,000,000 |
| South Carolina Ports Authority | Expansion of container terminal | Charleston, South Carolina | 26,000,000 |
| Port Authority of New Orleans | Construction of wharf & transit shed | New Orleans, Louisiana | 22,500,000 |



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River & Inland Waterways



Numerous Jobsites: Great Lakes has done maintenance work on the U.S. river system, ranging as far north as Minnesota, as far south as the delta region at the mouth of the Mississippi. Below, the America.

The river and inland waterway market, a growing area of involvement for Great Lakes, is concerned primarily with the maintenance of navigation on the Mississippi, Ohio and Missouri Rivers, and includes work at the mouth of the Mississippi, the Delta region of Louisiana, as well as lock and dam excavation projects and highway fill work throughout the system. The company has also engaged in the construction of terminals and flood control levees.

Great Lakes has a number of pieces of equipment well suited for this work, including:

- The *Louisiana*, a self-propelled 25-inch (635-mm) discharge hydraulic cutterhead dredge
- The *America*, a 24-in (610-mm) discharge cutterhead dredge
- The *Columbus*, an 18-in (457-mm) discharge cutterhead dredge
- The *Conical*, a side-casting clamshell dredge featuring a 240-ft (71-m) boom
- Clamshell (grab) Dredges No. 55 and 56, having buckets ranging in size from 5 to 12 yd³ (4 to 9 m³)



River & Inland Waterways



The Louisiana performs maintenance work on the Kanawha River in connection with annual Ohio River maintenance work.



The Conical at work on the storm protection system on the Bayou Lafourche in Louisiana.



Dredge No. 55 performs riverfront maintenance dredging.



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Pier J: Port of Long Beach, California



Pier J in Progress: The dredge Florida (visible at top center) pumps sand into the main fill. Below, after completion of the project, the 120-acre (50-hectare) plot undergoes development. At bottom, the Florida at work early in the project.

Project
Pier J Expansion

Customer
Port of Long Beach

Location
Long Beach, California

Contract Value
US\$80,000,000

Contract
Construct a 120-acre (50-hectare) landfill as part of the Port of Long Beach/Port of Los Angeles 2020 Expansion Program

Description

- Construction of 12,000 feet (3,650 m) of perimeter rock dikes for reclamation area
- Dredging and placement of 13,750,000 yd³ (10,500,000 m³) of material in containment area
- Controlled placement was closely coordinated with dike construction to create a solid foundation
- Dredged depths in excess of 90 ft (27.4 m)
- Project finished three months ahead of schedule

Quantities

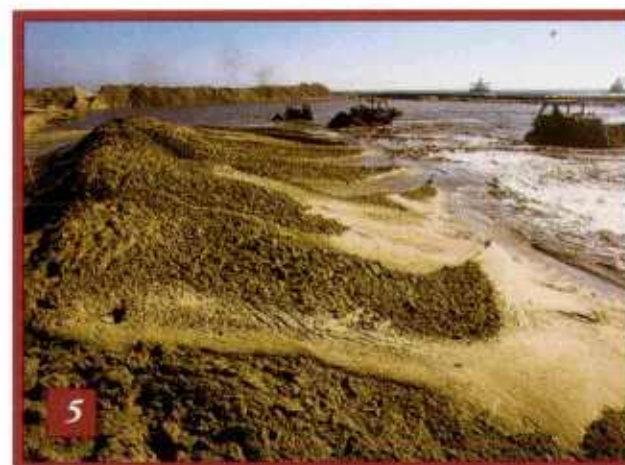
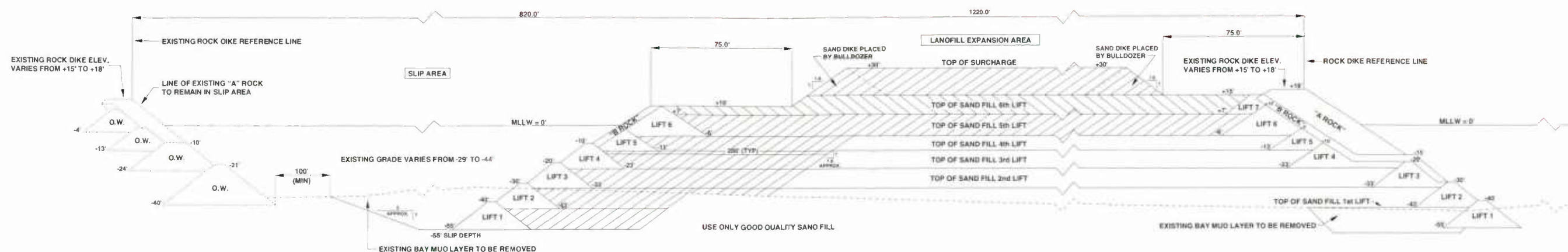
| | Imperial | Metric |
|--------------------|----------------------------|---------------------------|
| ■ Armor rock | 600,000 tons | 545,450 m tons |
| ■ Dike rock | 1,700,000 tons | 1,545,450 m tons |
| ■ Reclamation fill | 13,750,000 yd ³ | 10,500,000 m ³ |

Equipment Used

- Hydraulic cutterhead dredge Florida
- Clamshell Dredge No. 53
- Split-hull hopper barges
- Spill barge GL 151



Pier J: Port of Long Beach, California



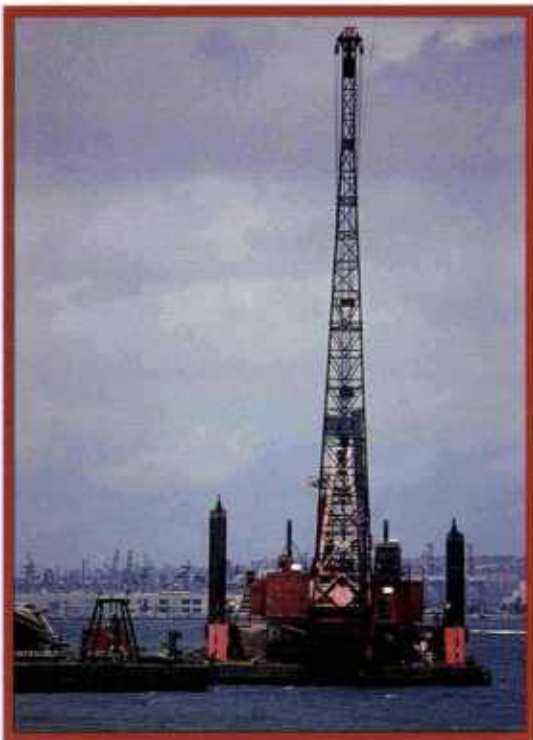
Pier J Takes Shape: This sequence shows the development of Pier J over a 9-month period. (1) The rock perimeter wall begins to emerge. (2) The future outline of the facility becomes visible. (3) Fill along the outer edges of the southern portion breaks the surface. (4) The project nears completion. A container facility is to be built on the site, which is part of the port's long-term 2020 Expansion Program.

Fill Management: 5) Bulldozers working the fill at the discharge of Florida's pipeline. 6) Reclamation area as Lift 6 emerges from the water. 7) Water level "A" rock is in place, with surcharge under construction. 8) Project nearing completion.

Pier J: Port of Long Beach



Dredging & Filling: Portions of the fill were along narrow sections of the lining of the facility. Below, left, Dredge No. 53 removed unsuitable material from under the rock perimeter wall. At right, a clay material cutterhead of the dredge Florida.



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International Mobilization



The dredge Boston, Drillboat Algonquin and attendant plant prepare for tow to the Middle East. Below, dredges Boston, Crest and Georgia, with attendant plant, return to the United States upon completion of the Jebel Ali project in the United Arab Emirates.

Great Lakes has been a frequent user of semi-submersible barges to mobilize its dredging equipment to such diverse locations as Argentina, Colombia, Kenya, Panama, Saudi Arabia, and the United Arab Emirates.

Through the use of this method to transport heavy dredging equipment for international projects, the customer realizes savings through:

- Reduced transit time from port of origin to the project site
- Reduced marine insurance premiums
- Reduced on-site equipment preparation time
- Arrival of dredges and attendant plant at project site together, rather than as a number of separate mobilizations



International Mobilization



Positioning equipment for loading onto semi-submersible vessel.



Secured semi-submersible is refloated.



Under Way: The dredge Georgia, spider barge and attendant plant depart the United States en route to Saudi Arabia.



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Ft. McHenry Tunnel, Baltimore, Maryland



Tunnel Trenching: The dredge Illinois (above) excavates a deep trench into the river bank to provide for the flotation and installation of the steel tunnel tube sections.

Project

Ft. McHenry Tunnel for Interstate Highway 95

Location

Patapsco River, Baltimore, Maryland

Customer

City of Baltimore Department of Public Works
Maryland State Highway Administration

Contract Value

US\$36,000,000

Contract

- Tunnel trench dredging along compound curve
- Underwater backfill over tunnel tube sections
- Watermain realignment
- Operation and maintenance of Canton-Seagirt Dredge Disposal Site Effluent Treatment Facility

Quantities

- 5,400-ft (1,650-m) trench length
- 105-ft (32-m) maximum trench depth
- 3,700,000 yd³ (2,800,000 m³) dredging
- 1,000,000 yd³ (765,000 m³) backfill

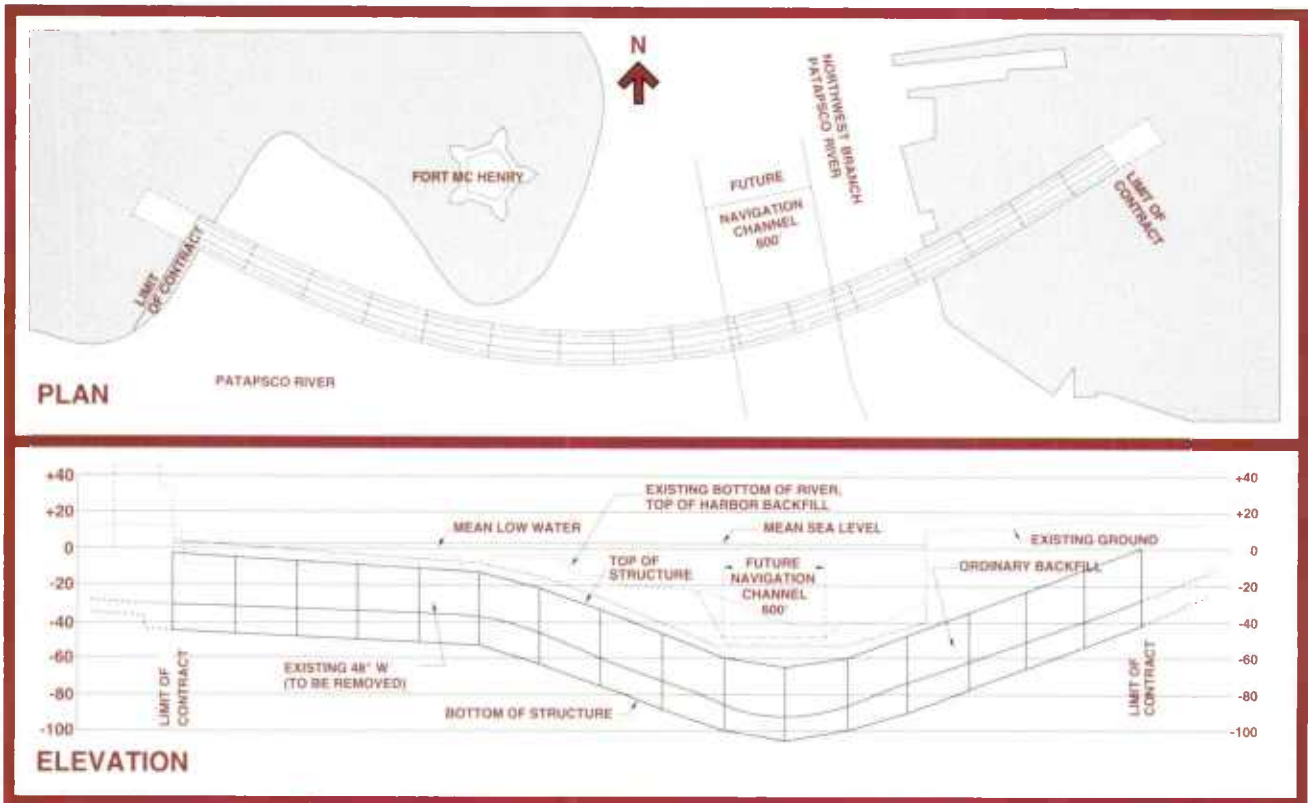
Equipment Used

- Hydraulic cutterhead dredge *Illinois*
- Trailing suction hopper dredge *Long Island*
- Clamshell (grab) *Dredge No. 54*
- Jack-up hydraulic booster station

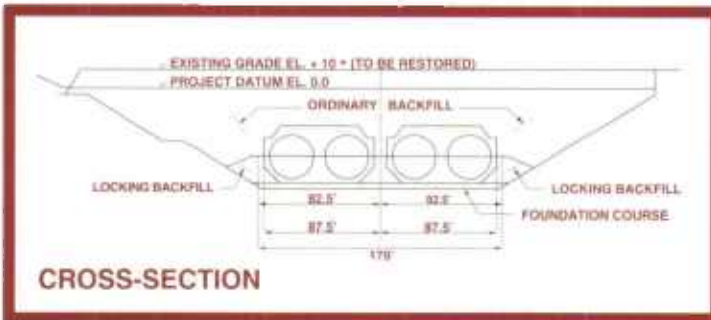


Strict turbidity standards required the construction of several treatment ponds and a special settling basin, where flocculants were employed to assure cleansing of the effluent before its return to the river.

Ft. McHenry Tunnel, Baltimore, Maryland



Electronic positioning and monitoring equipment were used to control dredging and backfilling. Below left, a typical cross-section of the project. Below right, clamshell (grab) Dredge No. 54 performed trimming of backfill and shallow excavation dredging. The trailing suction hopper dredge Long Island (bottom) mined sand from the Baltimore entrance channel which was used as backfill over tunnel tube sections.



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Ocean City, Maryland



Before & After: The restored beach and dune system at Ocean City. Inset: A typical section of beach before restoration.

Project

Ocean City Beach Replenishment & Hurricane Protection Project

Customer

U.S. Army Corps of Engineers, the State of Maryland, Worcester County and the Town of Ocean City

Location

Ocean City, Maryland

Contract

- Phase I: Restore beach to a nominal 200-ft (61-m) width along an 88,000-ft (27,000-m) shoreline
- Phase II: Construct a dune system 35,400 ft (10,800 m) long, with pedestrian crossings and dune grass plantings

Description

Phase I

- Place 2.4 million yd³ (1.8 million m³) of beach fill to the required shore slope template from borrow areas up to 3 miles (4.8 km) offshore
- Pumping distance up to 43,000 ft (13,100 m)
- Phase completed on schedule in four months

Phase II

- Place 3.6 million yd³ (2.8 million m³) of material to required dune template
- Pumping distance up to 35,000 ft (10,700 m)
- Construct 208 pedestrian crossover paths
- Project completed on schedule

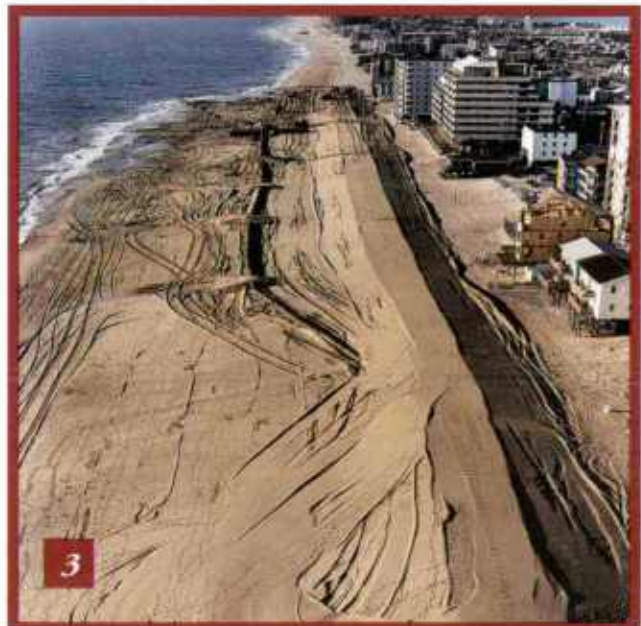
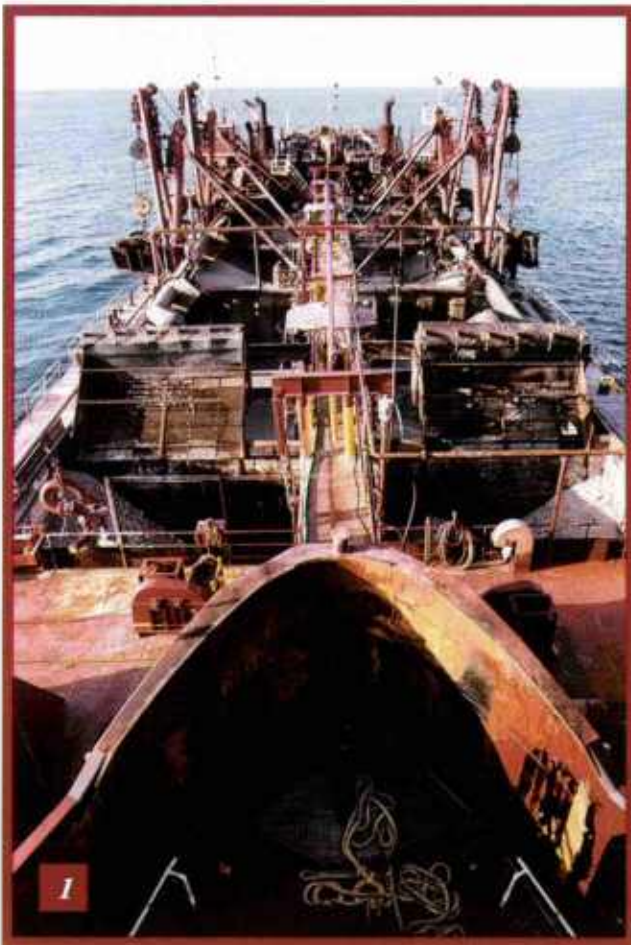
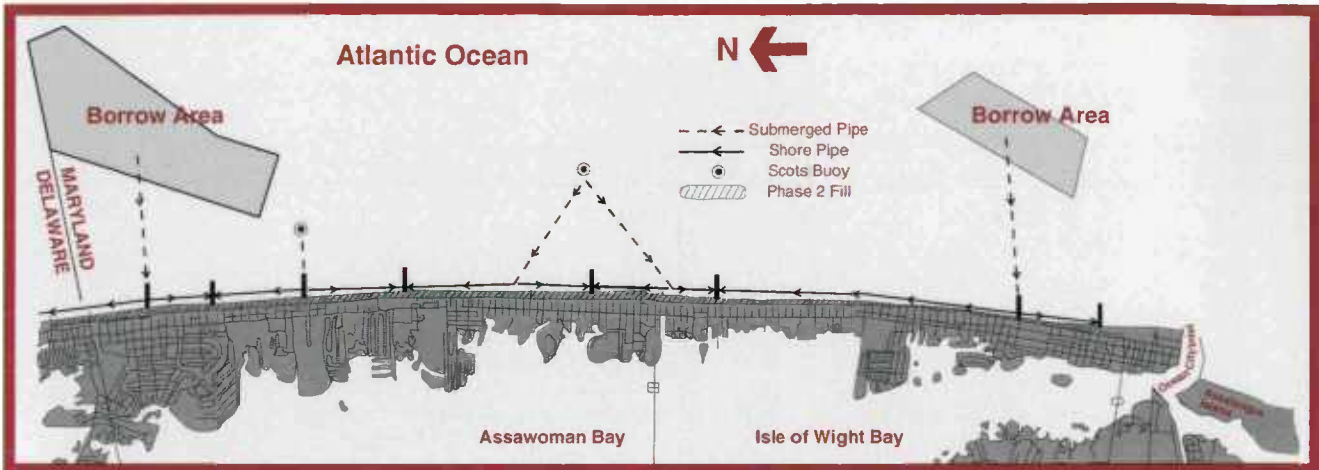
Equipment Used

- Hydraulic cutterhead dredges *Carolina* and *Illinois*
- Trailing suction hopper dredge *Long Island*
- Jack-up booster
- Self-contained offshore transport system (SCOTS) Buoy

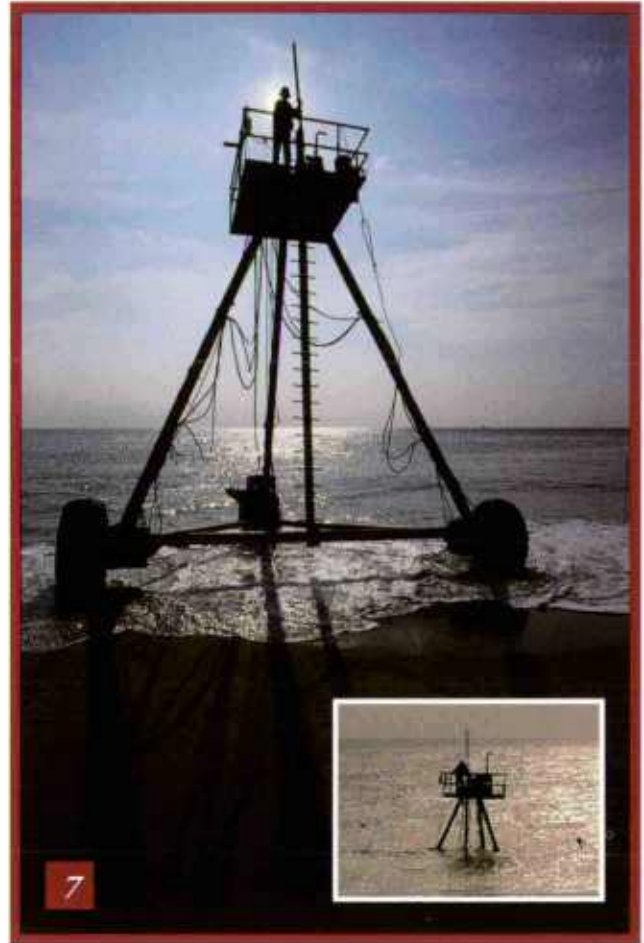
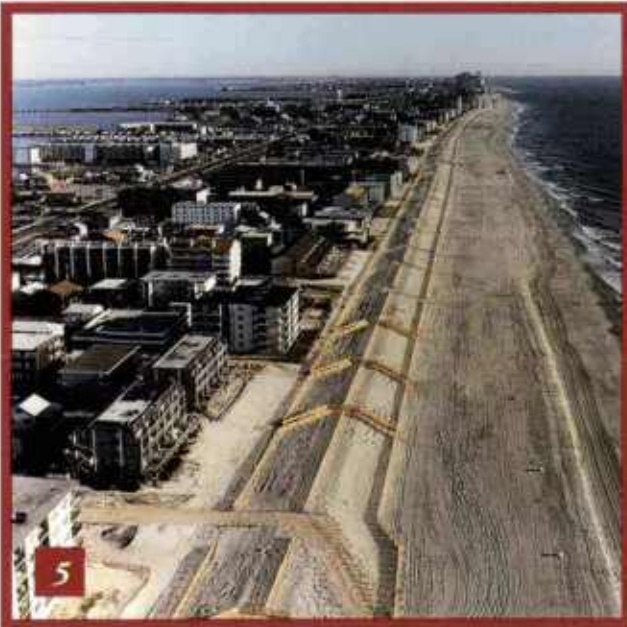


Offshore dredging for Phase I was performed by the hydraulic cutterhead dredge Carolina (above) and the trailing suction hopper dredge Long Island, shown pumping material ashore via the SCOTS Buoy.

Ocean City, Maryland



Building the Beach at Ocean City: (1) Looking forward across the mid-section of the Long Island from the bridge of her tug. (2 & 3) The southern end of the dune system as it took shape. (4) A pipeline discharge site. (5) The finished dune structure, with pedestrian crossovers and protective fencing. (6) Protective dune grass began to show as the summer tourist season progressed. (7) The Coastal Research Amphibious Buggy (CRAB) was used to measure the beachfill template in the surf zone.



Ocean City, Maryland



The trailing suction hopper dredge Long Island, a tug-integrated dredge, worked on both phases of the project.



Phase II Equipment included the hydraulic cutterhead dredge Illinois and the jack-up booster.

Other Beach Restoration Projects

| Beach Location | Volume | | Beach Location | Volume | |
|---------------------------|-------------|--------------|--------------------------|-------------|--------------|
| | Cubic Yards | Cubic Meters | | Cubic Yards | Cubic Meters |
| ■ Asharoken Beach, N.Y. | 62,000 | 47,000 | ■ Hunting Island, S.C. | 1,003,000 | 767,000 |
| ■ Bal Harbor, Fla. | 1,200,000 | 917,500 | ■ Jupiter Island, Fla. | 470,000 | 359,000 |
| ■ Boca Raton, Fla. | 1,100,000 | 841,000 | ■ Lloyd State Park, Fla. | 675,000 | 616,000 |
| ■ Cape May Inlet, N.J. | 840,000 | 642,000 | ■ Miami Beach, Fla. | 2,200,000 | 1,682,000 |
| ■ Carolina Beach, S.C. | 696,000 | 532,000 | ■ Palm Beach, Fla. | 1,900,000 | 1,452,700 |
| ■ Dade County, Fla. | 2,200,000 | 1,682,000 | ■ Pea Island, N.C. | 200,000 | 153,000 |
| ■ Delray Beach, Fla. | 900,000 | 688,000 | ■ Pensacola, Fla. | 4,960,000 | 3,792,000 |
| ■ DuVal City, Fla. | 965,000 | 738,000 | ■ Pompano Beach, Fla. | 1,800,000 | 1,376,300 |
| ■ Fire Island Inlet, N.Y. | 700,000 | 535,000 | ■ Rockaway Beach, N.Y. | 1,100,000 | 841,000 |
| ■ Ft. Lauderdale, Fla. | 500,000 | 382,000 | ■ Sandy Hook, N.J. | 3,123,000 | 2,388,000 |
| ■ Ft. Pierce, Fla. | 426,000 | 325,700 | ■ Seabrook Island, S.C. | 662,000 | 506,000 |
| ■ Hereford Inlet, N.J. | 200,000 | 153,000 | ■ Shinnecock Inlet, N.Y. | 456,000 | 349,000 |
| ■ Hilton Head, S.C. | 2,000,000 | 1,529,000 | ■ Virginia Beach, Va. | 1,100,000 | 841,000 |
| ■ Hollywood, Fla. | 1,157,000 | 885,000 | ■ Wilmington, N.C. | 300,000 | 229,000 |



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Nashville Ave. Terminal, New Orleans



A total of 4,640 tubular steel and steel-reinforced concrete piles were required for Nashville Ave. Wharf.

Project

Nashville Avenue Terminal Complex

Customer

Port of New Orleans, Louisiana

Contract

Construct a 1,750-ft- (522-m-) long pile-supported concrete wharf

Description

- Excavate 85,000 yd³ (65,000 m³) material
- Place 70,000 yd³ (53,500m³) of stone fill
- Place 55,000 tons (60,500 m tons) rip-rap
- Drive 3,400 concrete piles, 1,240 steel piles, from 90 to 150 ft (27 to 46 m) in length
- Form, pour and place 441,000 ft² (40,970 m²) of precast deck slabs
- Cast in place 44,000 ft² (4,088 m²) pile caps
- Cast in place 441,000-ft² (40,970-m²) concrete deck
- Erect 150,000-ft² (13,935-m²) shed
- Install 2,200 ft (670 m) rail for railroad
- Install 2,200 ft (670 m) rail for container crane

Equipment Used

- Three 230-ton cranes
- Three spud barges, two deck barges
- One dragline on spud barge
- One hydro-crane on shore
- One crane on shore



Crane removes a tubular steel pile from barge for placement.

Nashville Ave. Terminal, New Orleans



Pile driver nears completion of a section of steel pilings. Below left, final adjustments of the template are made. Below right, steel pilings have been cut off at deck level. The tight construction schedule called for commencement of driving operations 45 days after contract award.



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Kill Van Kull, New York Harbor



In New York Harbor: The Chicago waits to exchange a filled barge for an empty one (above). Below, the dipper dredge Mogul and clamshell Dredge No. 54 at work with drillboats. At bottom, Drillboat No. 8 and the Algonquin.

Project

Kill Van Kull Channel Deepening Project

Customer

U.S. Army Corps of Engineers
Port Authority of New York and New Jersey

Location

New York Harbor

Value of Contracts

US\$152,000,000

Contract

Deepening of the Kill Van Kull Channel from New York Harbor to lower Newark Bay, creating 40-ft (12.2-m) deep access to Port Elizabeth and Port Newark

Description

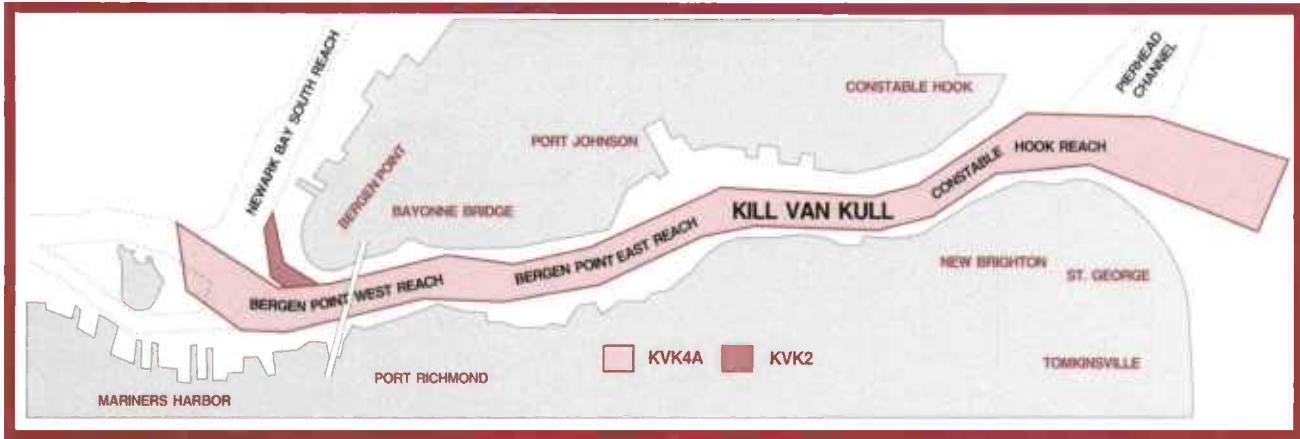
- Drilling and blasting of granite, diabase, serpentine and glacial till along 5.5 miles (9 km) of channel 800 ft (245 m) wide
- Dredged material used to construct a special fish reef located 27 miles (43.5 km) from project site

Great Lakes Equipment Used

- Dipper dredges *Chicago* and *Mogul*
- *Drillboats No. 8* and *Algonquin*
- Clamshell (grab) *Dredges No. 52 & 54*, and *Boston*



Kill Van Kull, New York Harbor



Kill Van Kull Scope: The project reaches through 5.5 miles (9 km) of the New York Harbor channel giving access to Ports Newark and Elizabeth; the KVK4A dredging contract is the largest ever let by the U.S. Army Corps of Engineers, the organization responsible for development and maintenance of all Federal Waterways in the United States.



Drilling, Blasting & Digging: Drillboat No. 8 (above left) drilling on the Kill Van Kull. At right, workers load drilled holes with explosive gel, detonating lines having been placed. The Chicago (bottom) loads the fragmented rock into a barge for transport to the offshore disposal area.

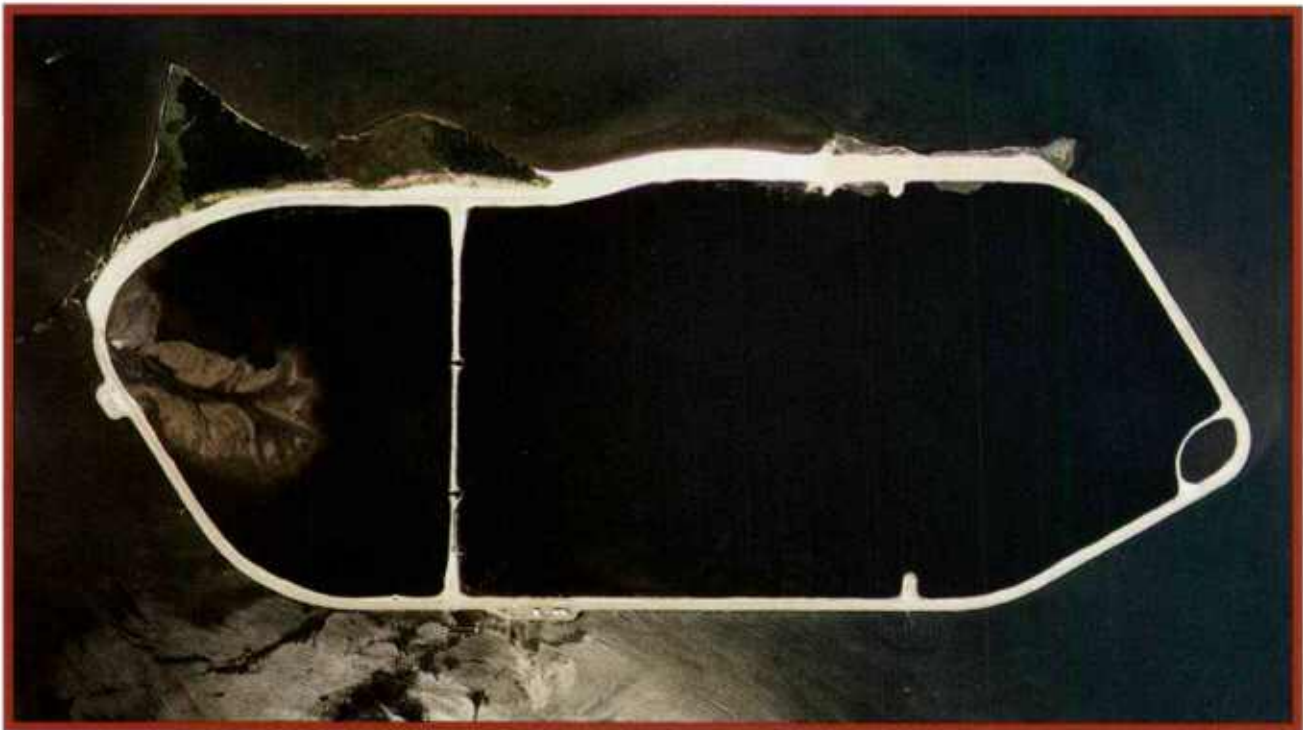


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Hart-Miller Island, Maryland



The completed containment area at Hart-Miller Island. Below, a crane prepares to offload roadbed material. At bottom, a Gradall begins dressing foundation stone laid on top of filter cloth.

Project

Diked Containment Area Construction

Customer

Maryland Port Administration

Location

Chesapeake Bay at Baltimore, Maryland

Contract

Construct a 1,140-acre (460-hectare) containment area within an armored 29,000-ft (8,840-m) sand dike to accept more than 50 million yd³ (38 million m³) of dredged material from Baltimore's port deepening and maintenance projects

Description

- Construct a dike that rises to 18 ft (5.5 m) above mean low water, and is 20 ft (6.1 m) wide at its top, 164 ft (50 m) at mean low water
- Construct weir structures and perimeter road
- Construct a mechanical unloading facility and two hydraulic pumpout berthing areas

Quantities

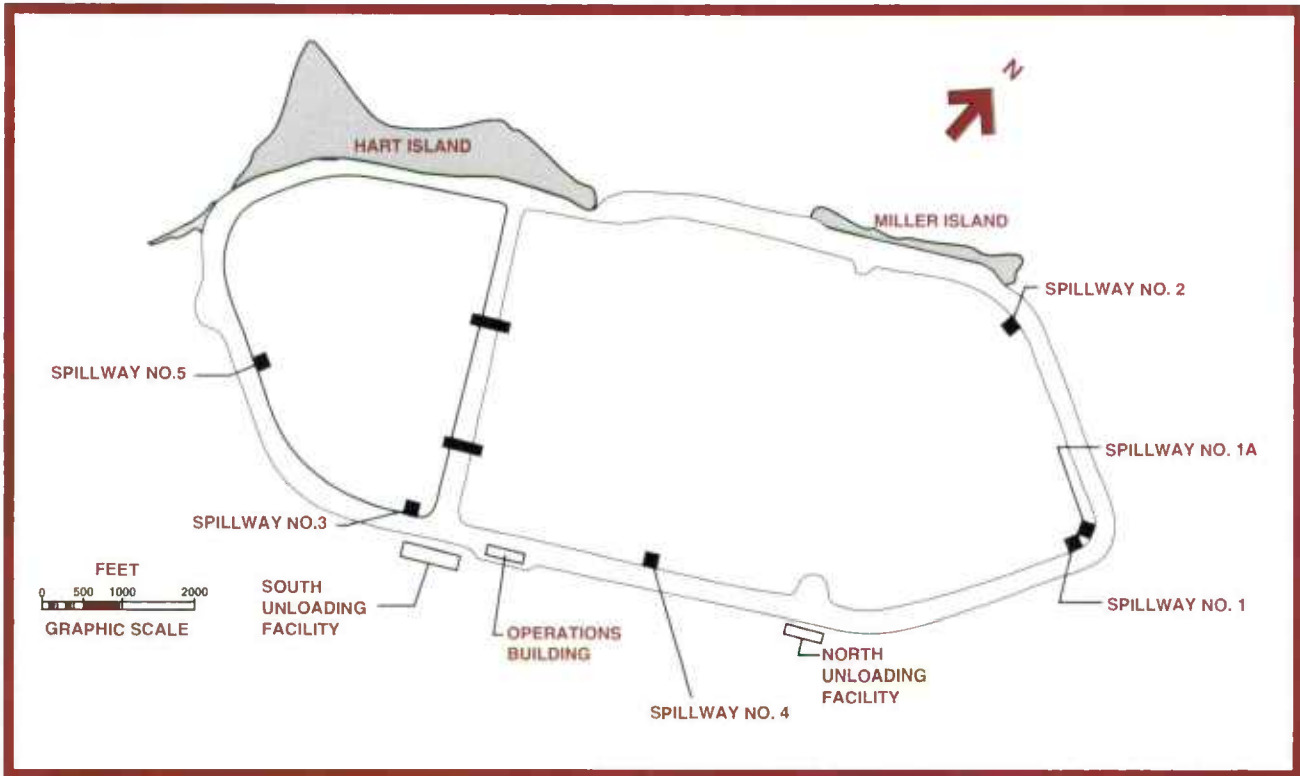
- Disposal of unsuitable foundation: 2.5 million yd³ (1.9 million m³)
- Hydraulic fill: 7.5 million yd³ (5.7 million m³)
- Stone slope protection: 460,000 tons (418,000 metric tons)
- Filter cloth: 2.25 million ft² (208,000 m²)
- Roadway construction: 600,000 ft² (55,800 m²)

Equipment Used

- Hydraulic cutterhead dredges *Illinois* and *Georgia*
- Cranes No. 2 & 3 (Manitowoc 4500s)



Hart-Miller Island, Maryland



Facility Layout: Since its construction, Great Lakes has placed more than 44,000,000 yd³ (33,640,000 m³) in the containment facility. Below, hydraulic Unloader No. 2 pumps material from a barge at the south unloading facility.



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Naval Pier & Trestle, Colts Neck, New Jersey



***Ammunition Pier:** Finished and in operation. Below, pile-driving proceeds from the deck of a jack-up barge. At bottom, precast, prestressed concrete caps are positioned atop the pilings.*

Project

Ammunition Pier and Trestle

Customer

U.S. Navy

Location

Colts Neck, N.J.

Contract

Construction of
Pier and Trestle

Contract Value

US\$46,000,000

Description

- Construction of pier 945 ft (288 m) long and 150 ft (46 m) wide
- Construction of approach trestle 1,500 ft (457 m) long and 46 ft (14 m) wide; total = 235,000 ft² (22,000 m²)
- Project completed on schedule and under budget

Quantities

- 432 steel pipe pilings, ranging in length from 126 to 143 ft (38 to 43 m)
- 178 cast-in-place caps
- 1,420 box beams and planks
- 15,800 yd³ (12,100 m³) concrete
- 9,600 ft (2,900 m) of rail
- 56 sets of large craft fenders

Equipment Used

- Jack-up barge with Manitowoc 4000 crane
- Manitowoc 4100 ringer crane on barge
- Two Manitowoc 4000 cranes on barges



Naval Pier & Trestle, Colts Neck, New Jersey



Deck Work Under Way: The trestle and pier measure 2,445 feet (745 m) in extent. (1) (Below) The crane on the jack-up barge raises a pile for driving. (2) Positioning a pile cap. (3) Barge-mounted 4100 Ringer Crane lifts caps into position; boom length is 230 ft.

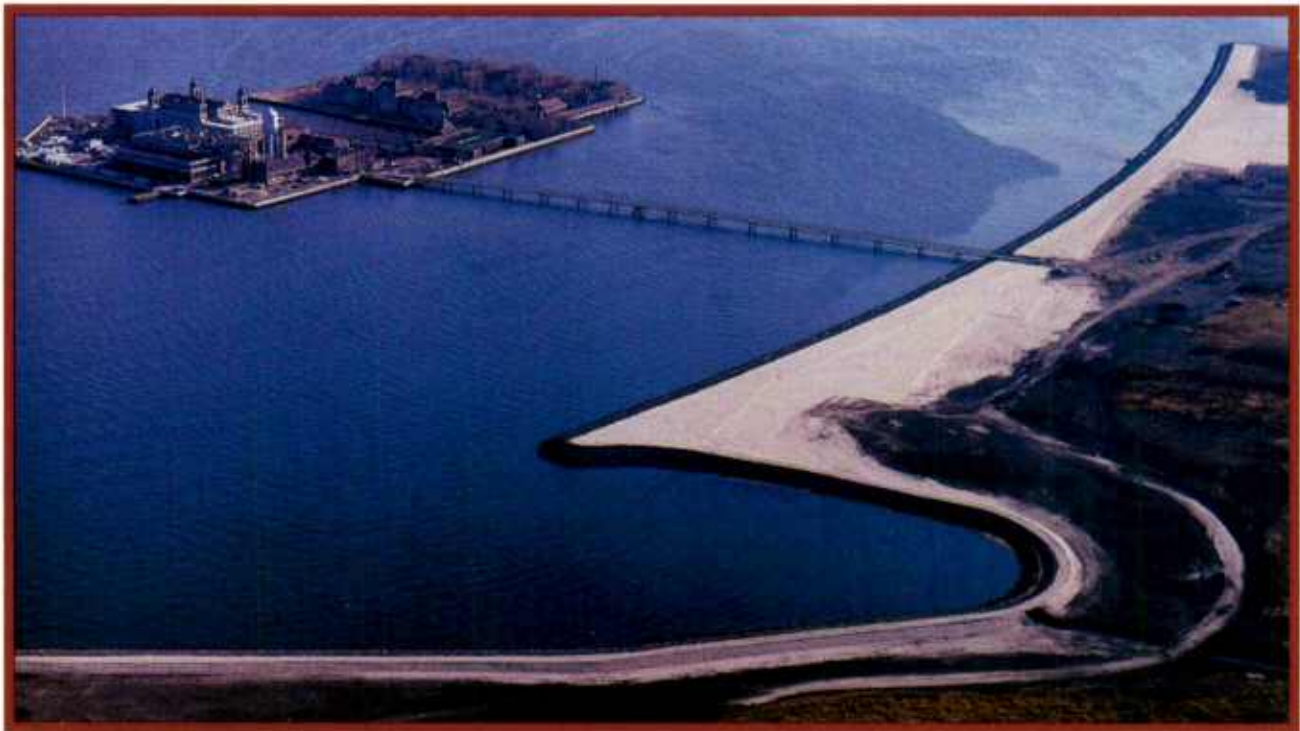


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Liberty State Park, New Jersey



Stone-Lined Seawall: The finished project, adjacent to Ellis Island and the Statue of Liberty. Below, the Northerly Island, using a turbidity curtain, discharges fill into the site.

Project

Seawall and landfill for Liberty State Park

Customer

U.S. Army Corps of Engineers

Location

Liberty State Park, Jersey City, New Jersey

Contract Value

US\$17,000,000

Contract

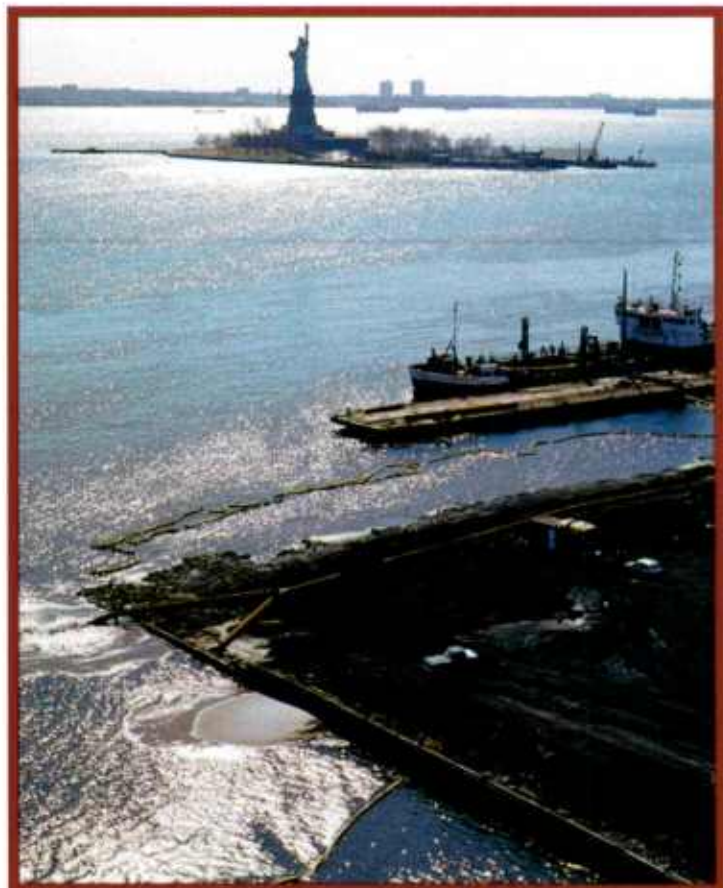
Construct a 6,200-ft (1,900-m) protective seawall and place landfill

Description

- Excavation of 263,000 yd³ (201,000 m³) of silts and sand
- Removal of waterfront debris
- Placement of 825,000 yd³ (631,000 m³) fill
- Placement of 65,000 yd³ (50,000 m³) of underlayer stone and protective armor rip-rap

Equipment Used

- Hydraulic cutterhead dredge *Georgia*
- Trailing suction hopper dredge *Northerly Island*
- Clamshell *Dredge No. 50*



Liberty State Park, New Jersey



Landfill and Seawall are connected to Ellis Island, at right, via a pedestrian bridge.



The trailing suction hopper dredge Northerly Island (above) transports material for placement. At right above, the hydraulic cutterhead dredge Georgia excavated silts and sand on the project. Below right, clamshell Dredge No. 50 removes material preparatory to placement of fill and armor stone.



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Portsmouth Harbor, New Hampshire



Drilling & Blasting: The convertible clamshell/dipper dredge Boston, in clamshell mode, dug material blasted by Drillboat No. 8, below.

Project

Harbor Improvement

Customer

U.S. Army Corps of Engineers
New England Division

Location

Portsmouth Harbor and Piscataqua River
Maine and New Hampshire

Contract Value

US\$13,500,000

Contract

- Widen channel, removing rock and unclassified materials
- Construct a turning basin adjacent to existing navigation channel, dredging to -37 ft (11 m)
- Project finished ahead of schedule

Quantities

- Glacial till overburden dredged: 430,000 yd³ (329,000m³)
- Rock drilled, blasted and dredged: 67,000 yd³ (51,000m³)
- Drilled 2,623 holes
- 259,000 pounds (117,450 kg) of gel explosives

Equipment Used

- Clamshell (grab) dredge Boston
- Drillboat No. 8
- Tug Melvin E. Lemmerhirt
- Split-hull dump barges





Sandy Hook, New Jersey



Jobsite: A total of 3.3 million yd³ (2.5 million m³) of material was removed from the Sandy Hook Channel for the U.S. Navy and placed on the beach for the U.S. Park Service. Below, the restored beach.

Project

Sandy Hook Entrance Channel Dredging and Beach Restoration Project

Customers

U.S. Navy Northern Division
U.S. National Park Service

Location

Gateway National Recreational Area, New Jersey

Contract

- Dredge Entrance Channel to maintain access to U.S. Naval Station Earle
- Place dredged material on shore recreational area

Description

- Hopper dredging used to excavate seven-mile entrance channel to width of 800 ft (243 m)
- Use dump/rehandle method with hydraulic cutterhead dredge to place material on beachfill site
- Create 85-acre (34-hectare) beach area

Quantities

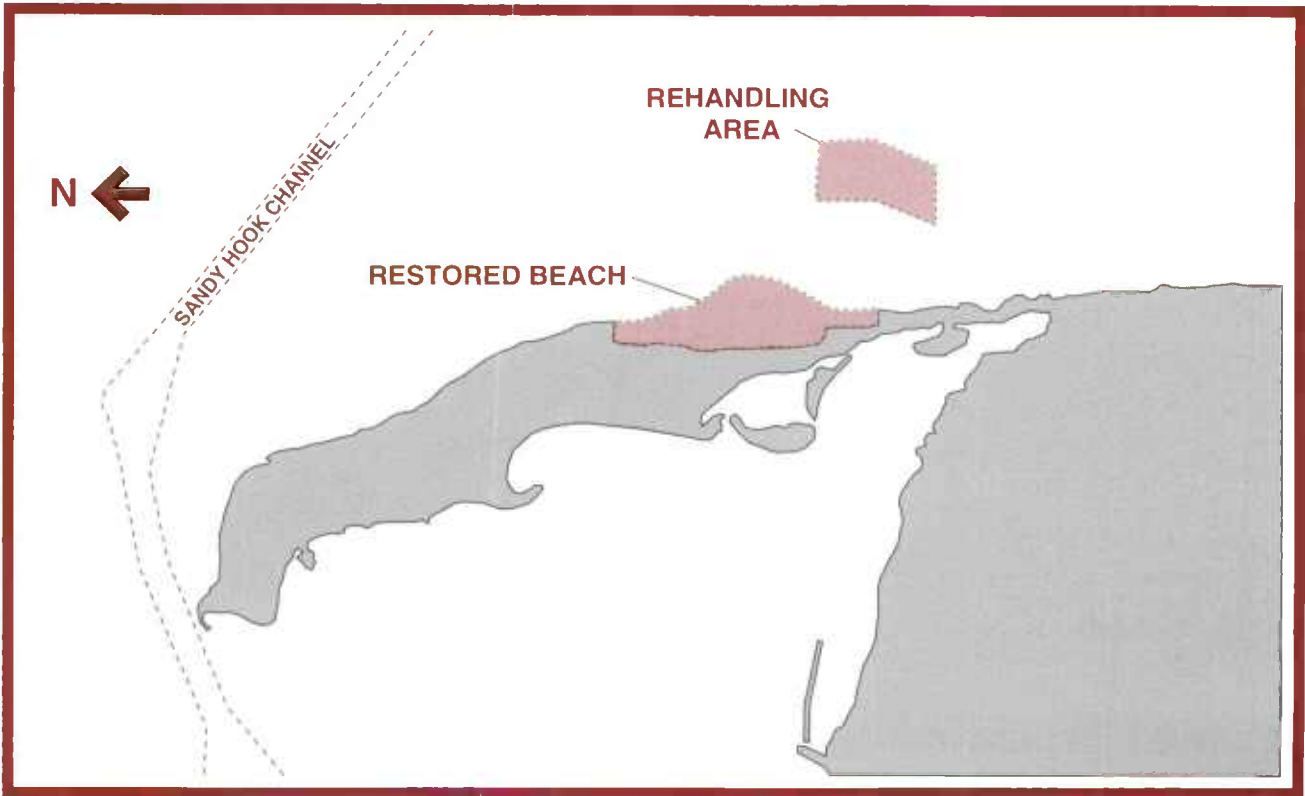
- 3.3 million yd³ (2.5 million m³) dredged

Equipment Used

- Hydraulic cutterhead dredge *Illinois*
- Trailing suction hopper dredges *Sugar Island* and *Dodge Island*



Sandy Hook, New Jersey



Maintaining and Restoring Material removed from the Sandy Hook Channel by the dredge Sugar Island (below left) was transported to a rehandling area, where it was picked up and pumped to the beach by the Illinois (below right).

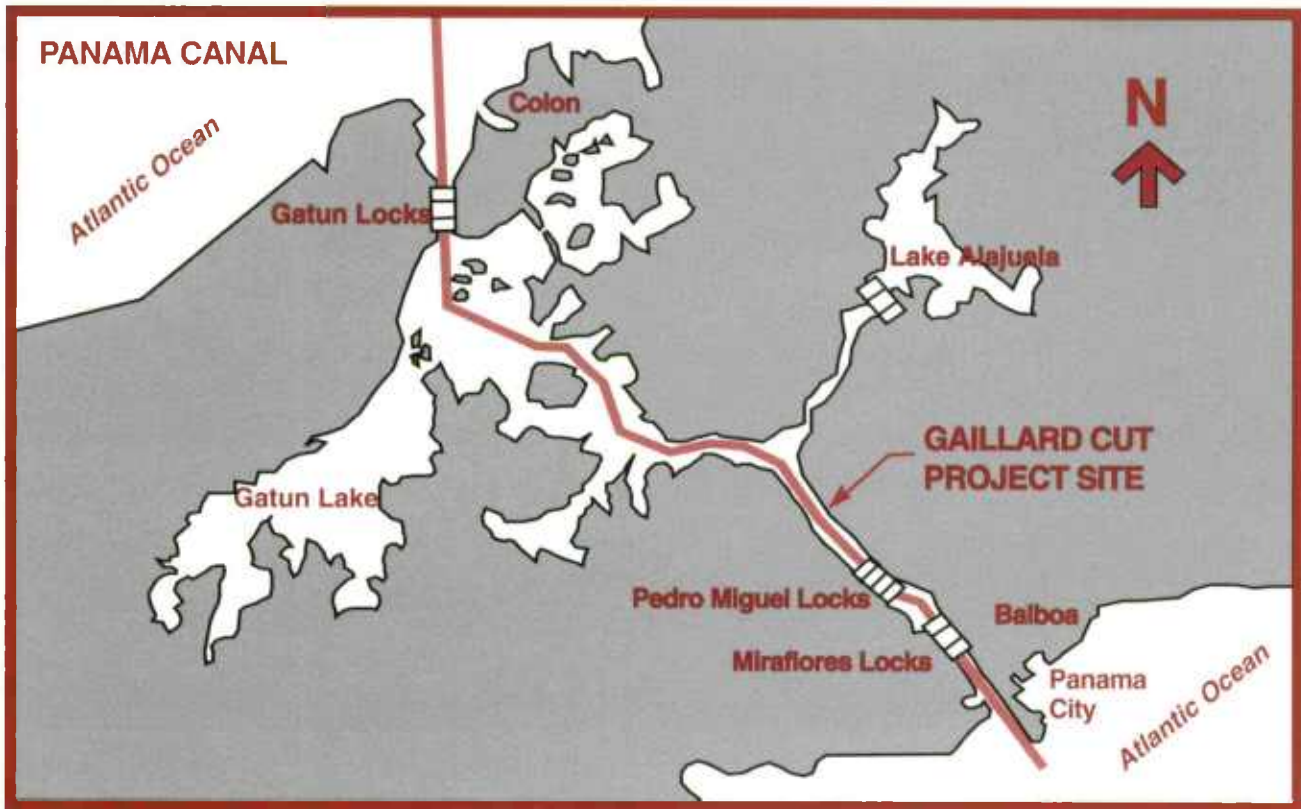


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Panama Canal Restoration



Landslide damage had occurred in the historic Gaillard Cut, necessitating removal of debris by dipper dredge. Landslide activity continued during dredging operations, was finally stabilized.

Project

Removal of Landslide Debris

Customer

Panama Canal Commission
 Republic of Panama

Location

Gaillard Cut in the Panama Canal, Panama

Contract Value

US\$5,530,000

Description

- Remove 183,000 yd³ (140,000 m³) of rock, boulders, clay, sand, logs and roots from landslide area in the Gaillard Cut
- Transport material 26 nautical miles (41 km) to disposal area at Gatun Lake
- Mobilization of equipment to project site was accomplished in 19 days

Equipment Used

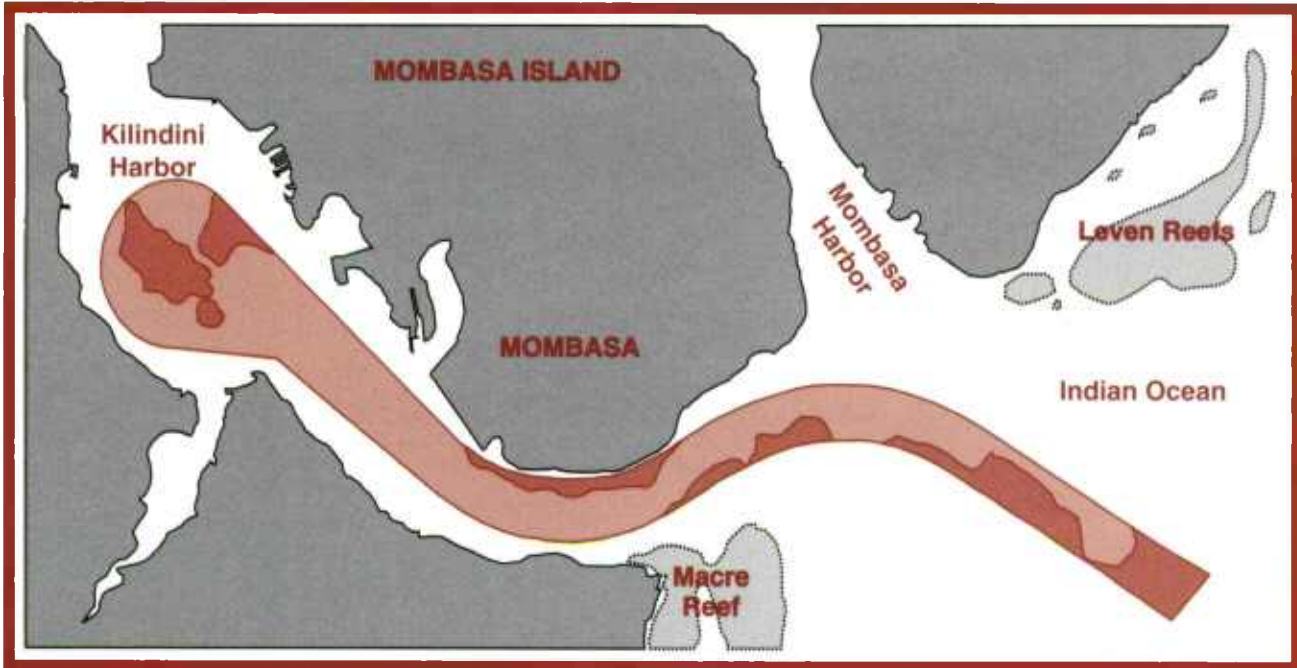
- Dipper dredges *Crest* and *Mogul*
- Tug *Melvin E. Lemmerhirt*
- Four 3,000-yd³ (2,290-m³) dump barges



*A landslide in the Gaillard Cut threatened to block navigation through the vital canal. The Panama Canal Commission contacted Great Lakes as the only company that could quickly mobilize the necessary dipper dredge fleet to solve the problem. Great Lakes loaded the dipper dredges *Crest* and *Mogul* and attendant plant (shown at work in the cut, above) onto a submersible tow, and within 19 days was on site removing the material. At no time was the canal forced to close.*



Kilindini Harbor, Mombasa, Kenya



Channel and Turning Basin: More than 3.1 million yd³ (2.4 million m³) were removed from Kilindini Harbor at Mombasa, Kenya, in enlarging the entrance channel and excavating a turning basin for the U.S. Navy.

Project

Entrance Channel & Turning Basin,
Kilindini Harbor

Location

Mombasa, Kenya

Customer

U.S. Navy

Description

- Widen entrance channel to 1,000 ft (305 m) and deepen channel to 46 ft (14 m) by removing rock, sand and clay over 3.3 miles (5.3 km) of channel's 4.8-mile (7.7-km) length
- Drill and blast for the removal of rock in waters under 6.5 to 10-foot (2 to 3-m) groundswell conditions
- Dramatic changes in the face and character of the material across the width of the channel made the project operationally difficult
- Material was dredged from bottom by hydraulic cutterhead dredge and loaded into material barge via a spider unloader, then transported 5 km to a disposal site

Quantities

- 3,100,000 yd³ (2,360,000 m³) dredged
- 1,000,000 yd³ (800,000 m³) drilled and blasted

Equipment Used

- Hydraulic cutterhead dredge *Alaska*
- Drillboat *Algonquin*
- Spiderbarge No. 150
- Derrick 160
- Three 2,000-yd³ (1,500-m³) material barges



The Alaska feeds material to barges by means on a spider barge.



Jebel Ali, Dubai, United Arab Emirates



Entrance Channel in Rock: The channel extended some 18 km into the Arabian Gulf. Below, semi-submersible tow carrying dredges and attendant plant return to the United States after completion of work.

Project

Entrance Channel Excavation

Customer Government of Dubai
Project Value US\$128,000,000

Location

The Port of Jebel Ali, Dubai, United Arab Emirates

Contract

Drill, blast and excavate an entrance channel varying in bottom width from 770 to 985 ft (235 to 300 m), to a depth of 52.5 ft (16 m), extending from the shoreline seaward approximately 11 miles (18 km)

Description

- Predominant material dredged was medium to hard rock; very hard rock occurred in some areas to a depth of 10 to 16 ft (3 to 5 m)
- Work was performed for the most part in unprotected waters (breakwaters were built to protect only the innermost 1.5 miles (2.4 km))
- Program was completed ahead of schedule

Quantities

- Total material dredged: 14,860,000 yd³ (11,361,000 m³)
- Total rock dredged: 12,633,000 yd³ (9,658,000 m³)

Equipment Used

- Dipper dredges *Crest* and *Boston*
- Hydraulic cutterhead dredge *Georgia*
- Drillboats *No. 7* and *Algonquin*
- Spider barge



Jebel Ali, Dubai, United Arab Emirates



In dipper mode, the dredge Boston digs in the entrance channel to Jebel Ali (above). Below left, the hydraulic cutterhead dredge Georgia; at right, workers on the drillboat Algonquin rig holes drilled in the rock for blasting.

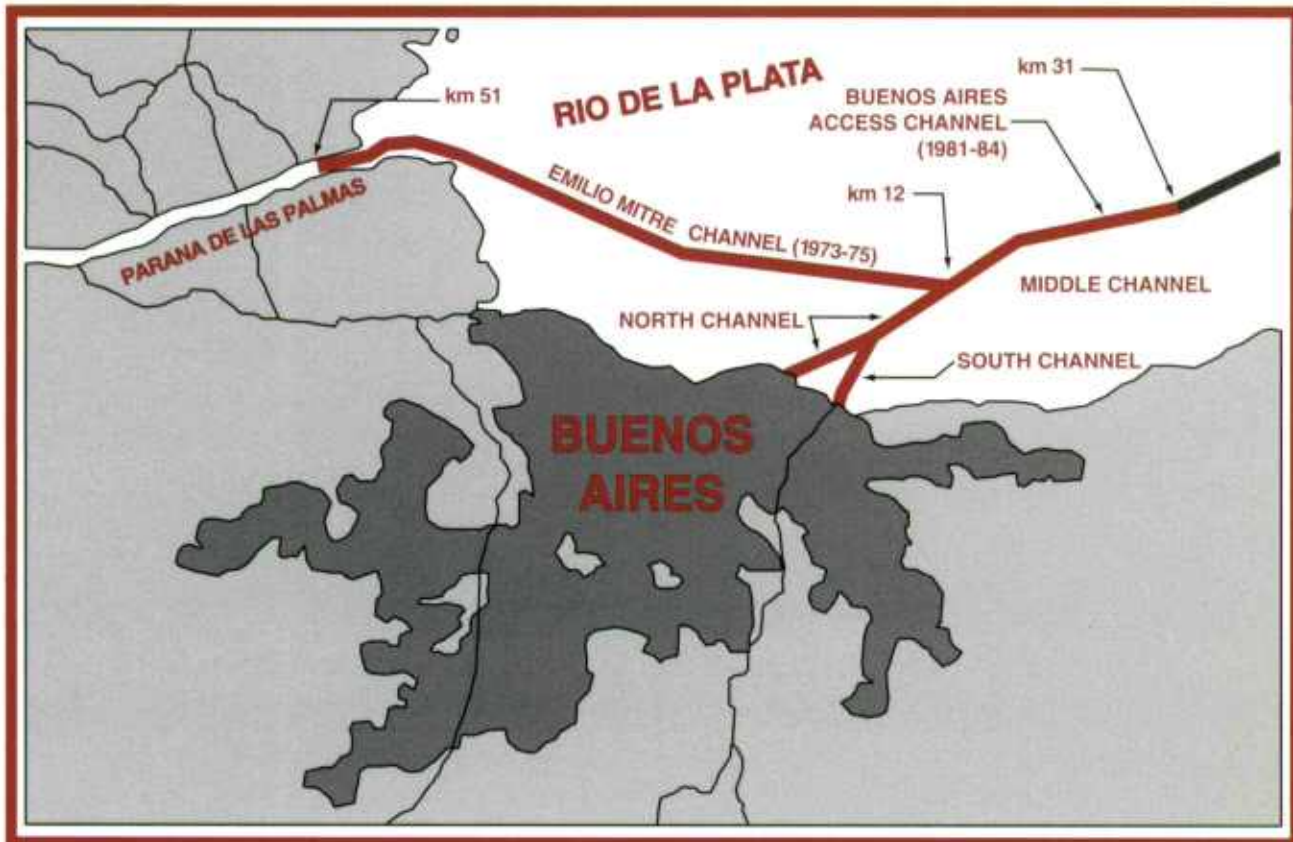


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Buenos Aires, Argentina



Shipping Access: This large project (a total of 119,000,000 yd³ [91,000,000 m³] was excavated) proceeded in two segments six years apart.

Project

Dredging access channels to Buenos Aires, Argentina

Customer

Government of Argentina, Department of Port Construction and Navigable Waterways

Project Value

Contract I: US\$56,257,000

Contract II: US\$60,000,000

Description

- Contract I: Excavation of the Emilio Mitre Channel, connecting the Parana de Las Palmas River at km 51 with the Buenos Aires access channel at km 12 in the Rio de la Plate
- Contract II: Excavation of extensions of the access channel: from km 31 to km 12 on the Mitre Channel, from km 12 to km 0.9 on the North Channel, and the excavation of a new Southern Channel

Quantities Excavated

- Contract I: 79,788,000 yd³ (61,000,000 m³)
- Contract II: 39,240,000 yd³ (30,000,000 m³)

Equipment Used

- Hydraulic cutterhead dredge *New York*
- Two 60-ton derricks



Hydraulic cutterhead dredge New York removing nearshore material at Buenos Aires.

The Great Lakes Dredging Fleet



Bucket Dredges

Chicago (Clamshell)



Bucket Capacity *30 to 50 yd³ (23 to 38 m³)*
Total Installed Power *9,430 hp (7,040 kW)*

Chicago (Dipper)



Bucket Capacity *18 to 30 yd³ (14 to 23 m³)*
Total Installed Power *9,430 hp (7,040 kW)*

Dredge No. 54



Bucket Capacity *Up to 26 yd³ (20 m³)*
Total Installed Power *2,340 hp (1,750 kW)*

Dredge No. 53



Bucket Capacity *Up to 26 yd³ (20 m³)*
Total Installed Power *2,550 hp (1,900 kW)*

Dodge Island



Hopper Capacity 3,600 yd³ (2,750 m³)
Total Installed Power 9,395 hp (7,010 kW)
Disposal Method Split-Hull Dump/Pump-Out

Sugar Island



Hopper Capacity 3,600 yd³ (2,750 m³)
Total Installed Power 9,395 hp (7,010 kW)
Discharge Method Split Hull Dump/Pump-Out

Manhattan Island



Hopper Capacity 3,600 yd³ (2,750 m³)
Total Installed Power 7,085 hp (5,290 kW)
Discharge Method Split-Hull Dump

Padre Island



Hopper Capacity 3,600 yd³ (2,750 m³)
Total Installed Power 7,530 hp (5,620 kW)
Discharge Method Split-Hull Dump

Northerly Island



Hopper Capacity 2,160 yd³ (1,650 m³)
Total Installed Power 4,915 hp (3,670 kW)
Discharge Method Split-Hull Dump/Pump-Out

Long Island



Hopper Capacity 16,000 yd³ (12,200 m³)
Total Installed Power 15,050 hp (11,225 kW)
Discharge Method Bottom Dump/Pump-Out

Jack-Up Barge



Hull Size 55 x 113 ft (17 x 34 m)
Spud Length 110 ft (33 m)

Work Boat Fleet



30 Launches, from 100 to 1,060 hp (75 to 795 kW)

Survey Fleet



13 Survey Boats, from 180 to 650 hp (135 to 487 kW)

Material Barge Fleet



Total of 43 material transport barges
Size Range: 1,540 to 6,330 yd³ (1,180 to 4,840 m³)
Hopper, split hull and bottom door configurations

Ringer



Manitowoc 4100 Crane with Ringer

Mogul



Bucket Capacity 9 to 12 yd³ (7 to 9 m³)
Total Installed Power 1,300 hp (992 kW)

Louisiana



Discharge Diameter 25 in (635 mm)
Total Installed Power 4,100 hp (3,064 kW)

Dredges No. 55 & 56



Bucket Capacity 5 to 12 yd³ (4 to 9 m³)
Total Installed Power 450 hp (340 kW)

America/Columbus



Discharge Diameter 18 to 24 in (457 to 610 mm)
Total Installed Power 3,325 to 5,180 hp (2,500 to 3,885 kW)

Cranes No. 1 & 2



Bucket Capacity 7 to 12 yd³ (5 to 9 m³)
Total Installed Power 885 to 1,025 hp (660 to 770 kW)

Cranes & Derricks



Total of 47 cranes and 8 derricks
Lift range: 68,000 to 600,000 pounds
(37 to 330 m tons)

Alaska



Discharge Diameter 30 in (760 mm)
Total Installed Power 11,200 hp (8,300 kW)

California



Discharge Diameter 30 in (760 mm)
Total Component Power Installed 14,652 hp (10,930 kW)

Carolina



Discharge Diameter 30 in (760 mm)
Total Installed Power 15,325 hp (11,432 kW)

Florida



Discharge Diameter 36 in (910 mm)
Total Component Power Installed 16,115 hp (12,022 kW)

Georgia



Discharge Diameter 26 in (660 mm)
Total Installed Power 6,800 hp (5,060 kW)

Illinois



Discharge Diameter 30 in (760 mm)
Total Installed Power 11,300 hp (8,400 kW)

Dredge No. 52



Bucket Capacity Up to 26 yd³ (20 m³)
Total Installed Power 1,745 hp (1,300 kW)

Dredge No. 51



Bucket Capacity 7 to 18 yd³ (5 to 14 m³)
Total Installed Power 1,890 hp (1,410 kW)

Dredge No. 50



Bucket Capacity 7 to 18 yd³ (5 to 14 m³)
Total Installed Power 1,260 hp (940 kW)

Conical



Bucket Capacity 6 to 12 yd³ (4.5 to 9 m³)
Total Installed Power 1,015 hp (757 kW)

Boston (Clamshell)



Bucket Capacity 10 to 22 yd³ (8 to 17 m³)
Total Installed Power 2,050 hp (1,530 kW)

Boston (Dipper)



Bucket Capacity 10 to 13 yd³ (8 to 10 m³)
Total Installed Power 2,050 hp (1,530 kW)

Sandy Hook



Hopper Capacity 5,100 yd³ (3,900 m³)
Total Installed Power 3,200 hp (2,390 kW)
Discharge Method Self-Unloading Conveyor

Tug Fleet



14 Tugboats, from 480 to 5,750 hp (358 to 4,290 kW)

Drillboat No. 8



Three 90-ft (27-m) Towers
Hydraulic Percussion Drills
Gel or Solid Explosives

Drillboat Algonquin



Three 90-ft (27-m) Towers
Hydraulic Percussion Drills
Gel or Solid Explosives

Hydraulic Unloaders



Three Units. Discharge Diameter: 14 to 26 in (360 to 610 mm)
Total Installed Power: 1,800 to 6,800 hp (1,350 to 5,100 kW)

Booster Stations



Three Units. Discharge Diameter: 19.5 to 30 in (500 to 760 mm)
Total Installed Power: 1,500 to 7,800 hp (1,120 to 5,850 kW)

Great Lakes Dredge & Dock Company

DIVISIONS

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415 Main St.
South Amboy, New Jersey 08879
Telephone 201/525-0620
Fax 201/727-0304

Gates Construction Corp.

208 Gates Rd.
Little Ferry New Jersey 07643
Telephone 201/342-4660
Fax 201/440-5065

Great Lakes Transport & Towing

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Telephone 914/353-4490
Fax 914/353-0012

Grant Dredging Co.

P.O. Box 136
Flinthill, Missouri 63346
Telephone 314/639-1880
Fax 314/639-1879

Registered in Hong Kong, Singapore, Australia, Argentina, Saudi Arabia and Canada

Marine yard facilities are maintained in Baltimore, Maryland; Morgan City, Louisiana.; Staten Island, New York; and Green Cove Springs, Florida



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Carolina

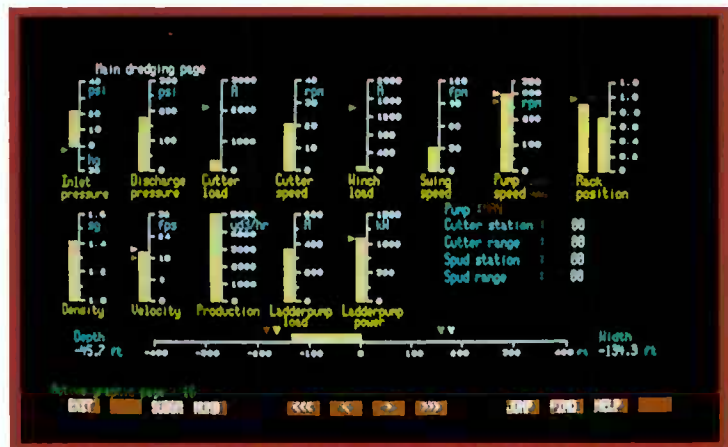


The Carolina prepares to pump sand for a beach renourishment project at Gilgo Beach, Long Island, New York.

The dredge Carolina's heavy-duty construction and high freeboard make her ideal for working offshore in rough conditions.

Applications

- Used offshore to mine material for land reclamation and beach nourishment, the Carolina has pumped mud and light materials up to 30,000 ft (9,100 m), sand to 25,000 ft (7,600 m). Greater distances can be achieved through the use of booster pumps.
- Nominal digging depth is 100 ft (30 m).
- Heavy ladder construction, underwater pump, ample cutter power and large inventory of special-purpose cutters enable the digging of blasted and unblasted rock.
- The dredge is equipped for overboard loading of scows for long-haul, bottom-dump disposal.



The Carolina performs overboard loading into bottom-dump barges for offshore disposal (above). Computerized display gives operator real-time dredge performance parameters.

Carolina



Rock Cutter: *The Carolina routinely excavates unblasted rock.*

Certification

ABS Class A-1 Ocean Loadline
U.S. Coast Guard Certificate of Inspection

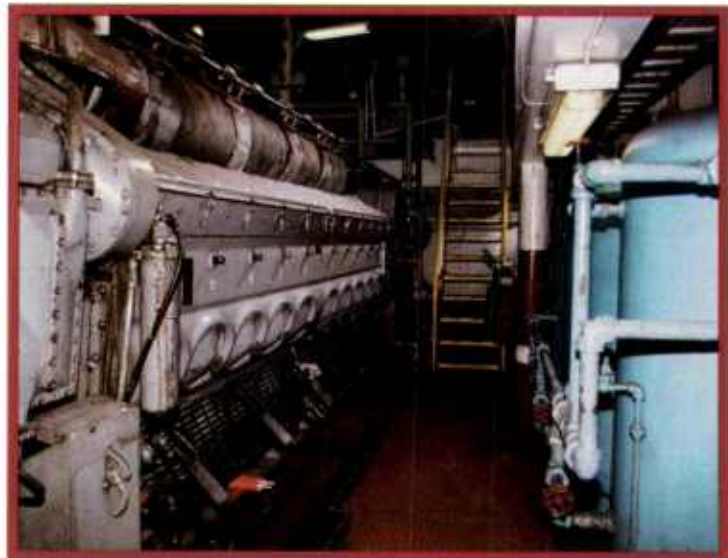
| | Imperial | Metric |
|--------------------|------------------|-----------------|
| Dimensions | | |
| Hull | 263 x 65 x 15 ft | 80 x 20 x 4.6 m |
| Draft | 9.5 ft | 2.9 m |
| Overall Length | 345 ft | 105 m |
| Suction Diameter | 32 in | 810 mm |
| Discharge Diameter | 30 in | 760 mm |
| Ladder Weight | 800,000 lb | 360,000 kg |

Performance

| | | |
|-----------------|---------------|--------------|
| Nominal Digging | | |
| Depth Range | 12 to 100+ ft | 3.7 to 30+ m |

Power Data

| | | |
|-----------------|-------------|-------------|
| Installed Power | 15,325 hp | 11,432 kW |
| Cutter Power | 2,000 hp | 1,500 kW |
| Fuel Capacity | 350,000 gal | 1,300,000 l |



The Engine Room on the Carolina. *Two 20-cylinder engines provide power to the dredge's main pump.*

The Carolina has quarters for 32 workers.



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Illinois



At Ocean City: The Illinois pumped sand to restore the beach and help build the dune system.

The *Illinois*' heavy-duty construction and high freeboard make her ideal for working offshore in rough conditions.

Applications

- Mining material offshore for land reclamation and beach nourishment, the *Illinois* has pumped mud and light materials up to 30,000 ft (9,150 m), and sand to 25,000 ft (7,625 m). Greater distances can be achieved through the use of booster pumps.
- Digs to a nominal depth of 104 ft (32 m).
- Heavy ladder construction, underwater pump, ample cutter power and large inventory of special purpose cutters enable the digging of blasted and unblasted rock.

The Illinois performing channel maintenance in Norfolk Harbor (Virginia). The clamshell (grab) Dredge No. 54 can be seen in the background loading a 4,000-yd³ (3,050-m³) barge.



Illinois



The dredge Illinois is equipped with an extension barge which lengthens the dredge and increases its swing width. The barge also houses towers and piping to enable overboard loading of material barges.

Certification

ABS Class A-1 Ocean Loadline
U.S. Coast Guard Certificate of Inspection

Imperial Metric

Dimensions

| | | |
|--------------------|------------------|---------------|
| Hull | 220 x 56 x 13 ft | 67 x 17 x 4 m |
| Draft | 8.5 ft | 2.6 m |
| Overall Length* | 320 ft | 98 m |
| Suction Diameter | 34 in | 860 mm |
| Discharge Diameter | 30 in | 760 mm |
| Ladder Weight | 843,000 lb | 382,400 kg |

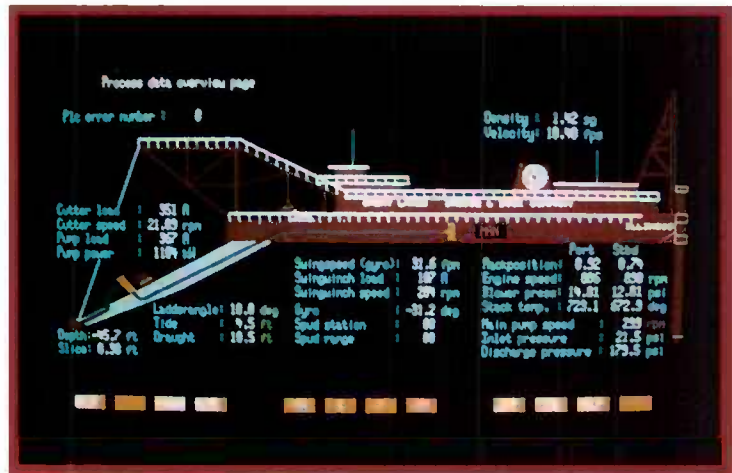
Performance

| | | |
|-----------------|---------------|--------------|
| Nominal Digging | | |
| Depth Range | 15 to 104+ ft | 4.6 to 32+ m |

Power Data

| | | |
|-----------------|-------------|-----------|
| Installed Power | 11,300 hp | 8,400 kW |
| Cutter Power | 1,900 hp | 1,400 kW |
| Fuel Capacity | 175,000 gal | 662,000 l |

*With her 160 x 52 x 9-ft (49 x 16 x 2.7-m) extension barge, the overall length of the Illinois is 480 ft (147 m).



Computerized display gives operator real-time dredge performance parameters.



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Alaska

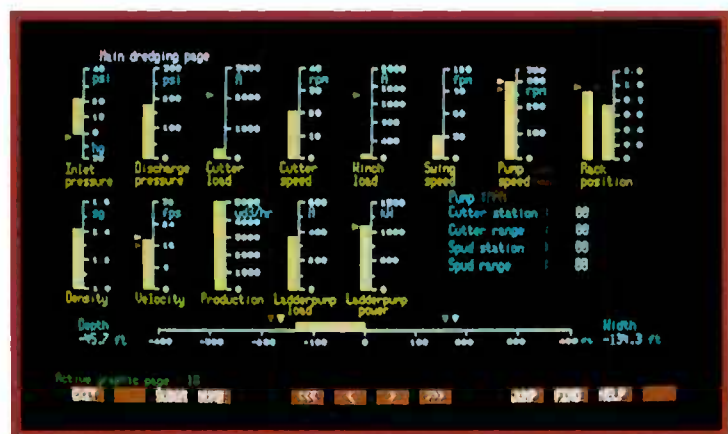


The *Dredge Alaska* is particularly well suited for offshore work in rough conditions, and can pump material up to 30,000 ft (9,100 m).

The *Alaska's* heavy-duty construction and high freeboard make her ideal for working offshore in rough conditions.

Applications

- Mining material offshore for land reclamation and beach nourishment, the *Alaska* has pumped mud and light materials distances up to 30,000 ft (9,100 m), and sand to 25,000 ft (7,600 m). Greater distances can be achieved through the use of Booster pumps.
- Digs to a nominal depth of 95 ft (29 m).
- Heavy ladder construction, underwater pump, ample cutter power and large inventory of special purpose cutters enable the digging of blasted and unblasted rock.



Pumping Power: The 7,200-hp (5,400-kW) main pump of the dredge *Alaska* (above). Maximum impeller size is 106 in (2.7 m) in diameter. Computerized display gives operator real-time dredge performance parameters.

Alaska



Land Reclamation: The Alaska at work in Kings Bay, Georgia. Using a spider barge (below), the dredge Alaska uses split-hull dump barges for offshore disposal at a project in Colombia. At bottom, a rock cutterhead for 30-inch (760-mm) dredges.

Certification

ABS Class A-1 Ocean Loadline
U.S. Coast Guard Certificate of Inspection

Imperial Metric

Dimensions

| | | |
|--------------------|------------------|---------------|
| Hull | 220 x 56 x 13 ft | 67 x 17 x 4 m |
| Draft | 8.70 ft | 2.7 m |
| Overall Length* | 310 ft | 95 m |
| Suction Diameter | 34 in | 860 mm |
| Discharge Diameter | 30 in | 760 mm |
| Ladder Weight | 670,000 lb | 300,000 kg |

Performance

| | | |
|-----------------|--------------|--------------|
| Nominal Digging | | |
| Depth Range | 15 to 95+ ft | 4.6 to 29+ m |

Power Data

| | | |
|-----------------|-------------|-----------|
| Installed Power | 11,200 hp | 8,300 kW |
| Cutter Power | 1,500 hp | 1,100 kW |
| Fuel Capacity | 125,000 gal | 475,000 l |

*With her 160 x 52 x 9-ft (49 x 16 x 2.7-m) extension barge, the overall length of the Alaska is 470 ft (143 m)



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California

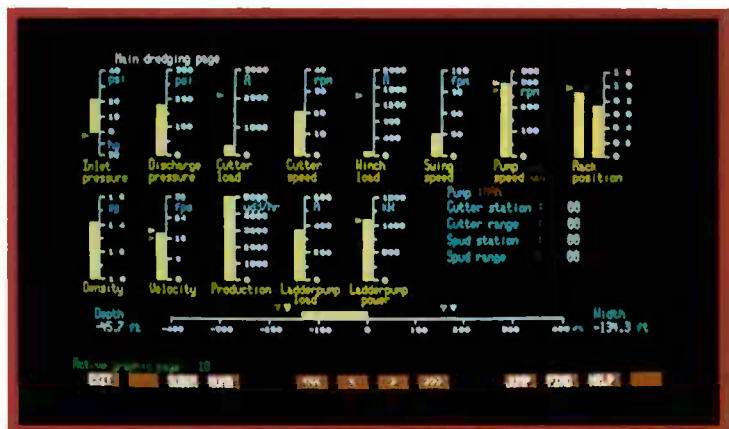


The California at work in the navigation channel at Ingleside, Texas.

The dredge *California* is one of the most powerful hydraulic dredges in operation in the U.S. An electric dredge, she is designed for work where power is available or air pollution controls are strict. Her heavy-duty construction and high freeboard make her ideal for working offshore in rough conditions.

Applications

- High cutter horsepower for digging of hard materials.
- Mining material offshore for land reclamation and beach nourishment, the *California* has pumped mud and light materials distances up to 35,000 ft (10,700 m), and sand to 25,000 ft (7,600 m). Greater distances can be achieved through the use of booster pumps.
- Digs to a nominal depth of 85 ft (26 m).
- Heavy ladder construction, underwater pump, ample cutter power and large inventory of special purpose cutters enable the digging of blasted and unblasted rock.



A rock cutter of the dredge California (above). Computerized display gives operator real-time dredge performance parameters.

California



Shallow Digging: The California works in the ship channel at Corpus Christi, Texas.

Certification

ABS Class A-1 Ocean Loadline
U.S. Coast Guard Certificate of Inspection

| | | |
|--|-----------------|---------------|
| | Imperial | Metric |
|--|-----------------|---------------|

Dimensions

| | | |
|--------------------|-------------------------|----------------------|
| Hull | 208 x 50 x 15 <i>ft</i> | 73 x 15 x 5 <i>m</i> |
| Draft | 8.8 <i>ft</i> | 2.7 <i>m</i> |
| Overall Length* | 291 <i>ft</i> | 89 <i>m</i> |
| Suction Diameter | 34 <i>in</i> | 860 <i>mm</i> |
| Discharge Diameter | 30 <i>in</i> | 760 <i>mm</i> |

Performance

| | | |
|------------------------|---------------------|-------------------|
| Nominal Digging | | |
| Depth Range | 15 to 85+ <i>ft</i> | 5 to 26+ <i>m</i> |
| Ladder Weight | 630,000 <i>lb</i> | 286,000 <i>kg</i> |

Power Data

| | | |
|------------------------|-------------------|------------------|
| Total Installed | | |
| Component Power | 14,652 <i>hp</i> | 10,930 <i>kW</i> |
| Main Pump Power† | 8,000 <i>hp</i> | 5,970 <i>kW</i> |
| Cutter Power | 1,950 <i>hp</i> | 1,460 <i>kW</i> |
| Fuel Capacity | 15,000 <i>gal</i> | 57,000 <i>l</i> |



Managing the pontoon line for the California at Corpus Christi.

*With 160 x 52 x 9-ft (49 x 16 x 2.7-m) extension barge, overall length is 451 ft (138 m).

†Shore-based electrical power.



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Florida



The Florida at work on the Pier J Expansion project in the Port of Long Beach, California.

The dredge *Florida* is an electric dredge designed for work where power is available or air pollution controls are strict. An idler (extension) barge can be attached to lengthen the dredge and increase its swing width. This barge also houses six generators that can produce a total of 18,000-hp (13,500 kW) for work where shore power is not available.

The *Florida's* heavy-duty construction and high freeboard make her ideal for working offshore in rough conditions.

Applications

- Mining material offshore for land reclamation and beach nourishment, the *Florida* has pumped mud and light materials up to 30,000 ft (9,100 m), and sand to 25,000 ft (7,625 m). Greater distances can be achieved through the use of booster pumps.
- Digs to a nominal depth of 101 ft (31 m).
- Heavy ladder construction, underwater pump, ample cutter power and large inventory of special purpose cutters enable the digging of blasted and unblasted rock.



Mud Cutter: Special-purpose cutters are available for a wide range of applications.

Florida



Pier Expansion: The Florida is visible on the far side of the emerging land mass of Pier J in Long Beach, California. The electric-powered Florida pumped the fill for this 120-acre (48-hectare) expansion program.

Certification

ABS Class A-1 River Service

Imperial Metric

Dimensions

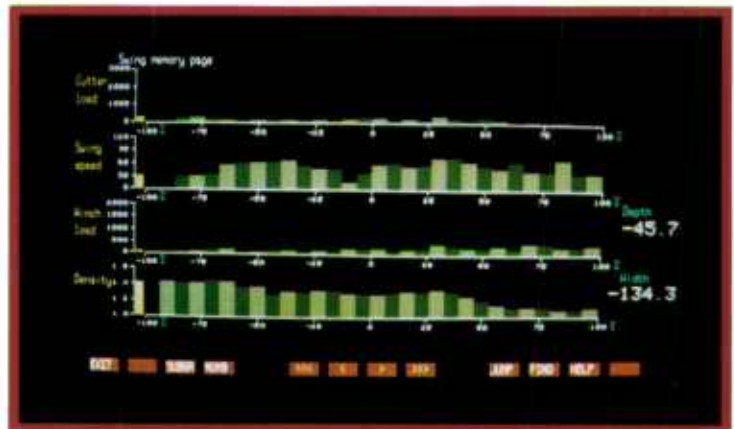
| | | |
|--------------------|------------------|-----------------|
| Hull | 190 x 50 x 14 ft | 58 x 15 x 4.3 m |
| Draft | 9.5 ft | 2.9 m |
| Overall Length* | 252 ft | 77 m |
| Suction Diameter | 42 in | 1,070 mm |
| Discharge Diameter | 36 in | 910 mm |

Performance

| | | |
|-----------------|---------------|------------|
| Nominal Digging | | |
| Depth Range | 20 to 101+ ft | 6 to 31+ m |
| Ladder Weight | 1,000,000 lb | 453,600 kg |

Power Data

| | | |
|------------------|-------------|-------------|
| Installed Power† | | |
| Main Pump | 10,000 hp | 7,460 kW |
| Cutter | 3,000 hp | 2,240 kW |
| Total Installed | | |
| Component Power | 16,115 hp | 12,022 kW |
| Fuel Capacity | 480,000 gal | 1,816,800 l |



Computerized display gives operator real-time dredge performance parameters.

*With her 217 x 50 x 12-ft (66 x 15 x 3.7-m) power barge, the overall length of the Florida is 469 ft (143 m)

†The Florida runs on external electrical power; her extension barge can generate 18,000 hp (13,500 kW)



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Georgia

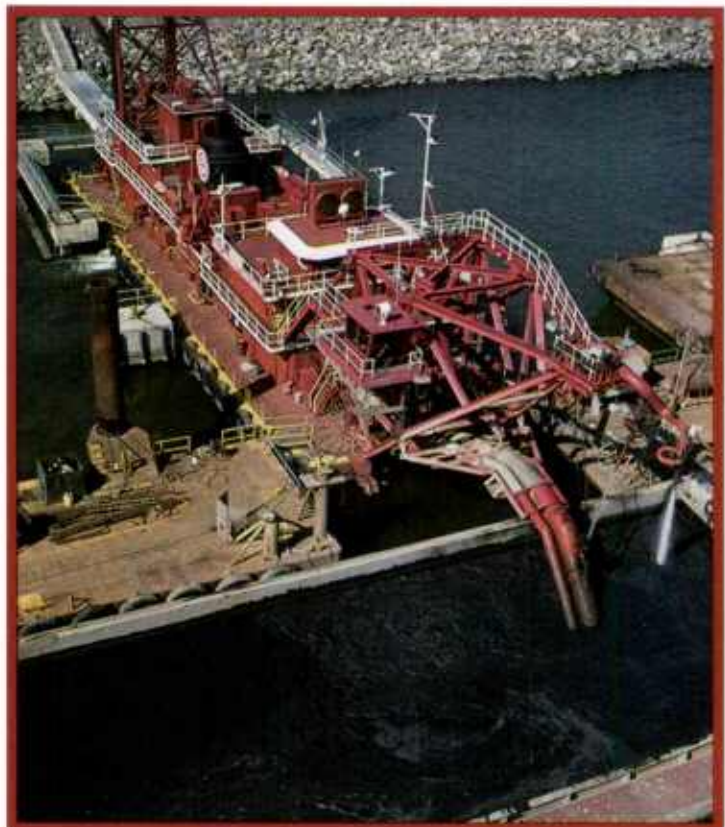


The Georgia being towed into position for a job on the eastern coast of the U.S.

The dredge *Georgia's* heavy-duty overall construction and high freeboard make her ideal for working offshore in rough conditions.

Applications

- Particularly useful where her small size enables her to dig in confined areas and shallow waters.
- Used offshore to mine material for land reclamation and beach nourishment, the *Georgia* has pumped mud and light materials up to 15,000 ft (4,600 m), sand to 10,000 ft (3,000 m). Greater distances can be achieved through the use of booster pumps.
- Digs to a nominal depth of 60 ft (18 m).
- Heavy ladder construction, ample cutter power and large inventory of special-purpose cutters enable the digging of blasted rock.
- With her snorkel attachment, the *Georgia* can be used as a barge unloader.



The versatile Georgia converts to a hydraulic unloader when required.

Georgia



The Georgia at work in the Rudee Inlet in Virginia.

Certification

ABS Class A-1 Ocean Loadline
U.S. Coast Guard Certificate of Inspection

Dimensional Data

| | Imperial | Metric |
|--------------------|------------------|-----------------|
| Hull Dimensions | 160 x 48 x 12 ft | 49 x 15 x 3.7 m |
| Draft | 8.7 ft | 2.7 m |
| Overall Length | 260 ft | 79 m |
| Suction Diameter | 31 in | 790 mm |
| Discharge Diameter | 26 in | 660 mm |
| Ladder Weight | 380,000 lb | 170,000 kg |

Performance Data

| | | |
|--------------------------------|--------------|------------|
| Nominal Digging Depth Range | 12 to 60+ ft | 4 to 18+ m |
|--------------------------------|--------------|------------|

Power Data

| | | |
|-----------------|------------|-----------|
| Installed Power | 6,800 hp | 5,060 kW |
| Cutter | 900 hp | 670 kW |
| Fuel Capacity | 92,000 gal | 349,000 l |



Long-haul disposal via barges can be accomplished through the use of a spider barge loading system, shown here at work with the Georgia in Dubai, U.A.E.. Below, the Georgia in tight quarters.



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Louisiana



The Louisiana removes material from the Barataria Waterway between Lafitte and Grand Isle in Louisiana. Below, she is at work in the Southwest Pass in the Mississippi River Delta.

The *Louisiana's* shallow draft and self-propulsion suit the dredge for river and inland waterway work.

Specifications

| | Imperial | Metric |
|--------------------|-------------------|-----------------|
| Dimensions | | |
| Hull | 150 x 51 x 7.6 ft | 46 x 16 x 2.4 m |
| Draft | 6.5 ft | 2.0 m |
| Overall Length | 230 ft | 70 m |
| Suction Diameter | 28.5 in | 724 mm |
| Discharge Diameter | 25 in | 635 mm |
| Performance | | |
| Nominal Digging | | |
| Depth Range | 10 to 75+ ft | 3 to 23+ m |
| Power Data | | |
| Main Pump Power | 3,000 hp | 2,237 kW |
| Cutter Power | 425 hp | 317 kW |
| Fuel Capacity | 28,000 gal | 105,980 l |





Chicago as a Dipper Dredge



The Chicago in dipper mode: Great Lakes' leadership in the dipper dredging market is a result of the company's commitment to build the finest, most efficient dredging equipment.

The dredge *Chicago* can operate both as a dipper dredge and as a clamshell (grab) dredge.

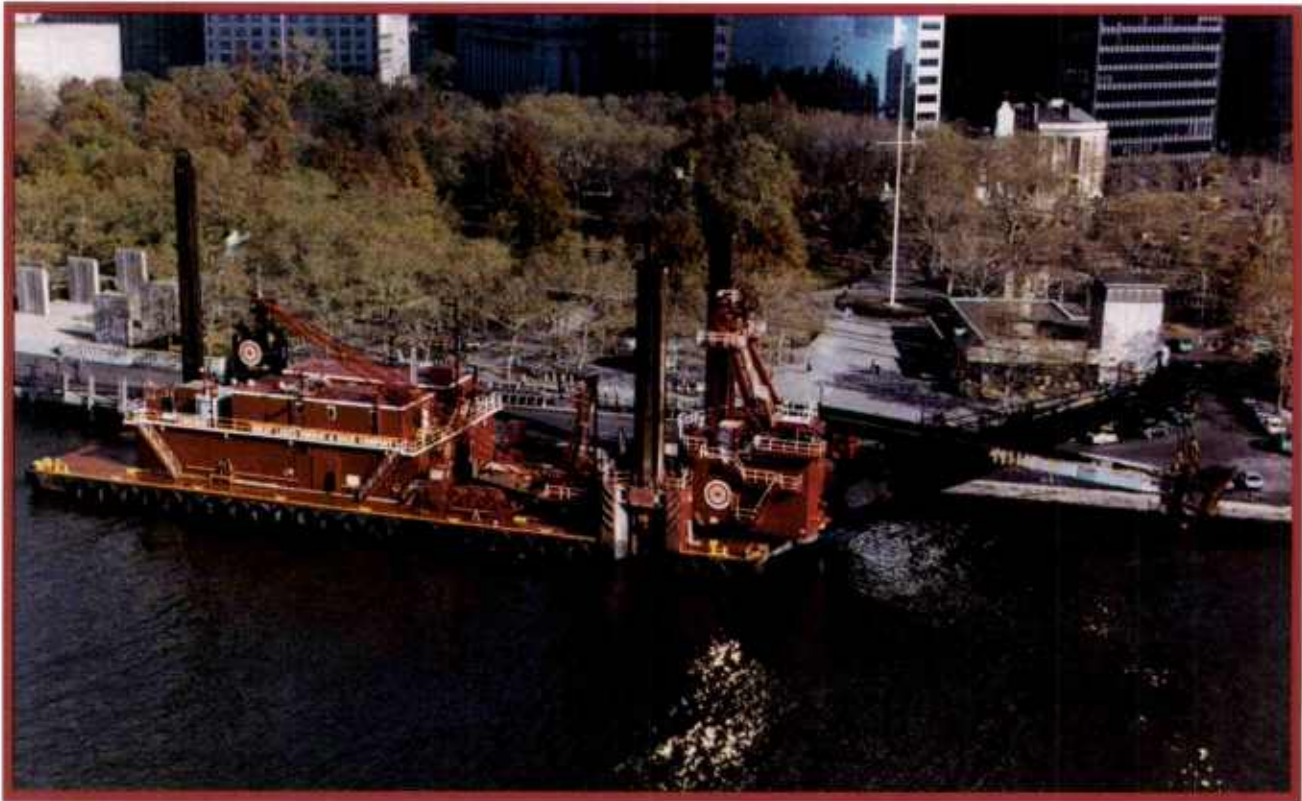
The *Chicago* is the world's largest and most efficient dipper dredge. She usually digs in conjunction with the Great Lakes fleet of drillboats to remove drilled and blasted rock, but can also dig in unblasted rock.

- Operates with:
 - 28-yd³ (23-m³) bucket for removal of blasted rock and glacial till
 - 18-yd³ (14-m³) bucket for unblasted rock-digging and removal of glacial till and boulders
- Operates with as many as four 6,000-yd³ (4,600-m³) barges
- Is ideally suited for high-production work with long-distance disposal
- Incorporates state-of-the-art positioning system and production monitoring instrumentation



The Chicago can, when necessary, dig directly in unblasted rock with her 18-yd³ (14-m³) bucket.

Chicago as a Dipper Dredge



The scale of the Chicago is demonstrated here by the vehicles parked behind her on the Manhattan shore.

Certification

ABS International Loadline

| | Imperial | Metric |
|--------------------|--------------------------|-------------------------|
| Dimensions | | |
| Hull | 223 x 75 x 15 ft | 68 x 23 x 4.5 m |
| Draft | 10.5 ft | 3.2 m |
| Bucket Size | 18 to 30 yd ³ | 14 to 23 m ³ |
| Performance | | |
| Digging Depth | 70 ft | 24 m |
| Linepull | 425,000 lbs @ 325 fpm | 1,890 kN @ 99 mpm |
| Stallpull | 650,000 lbs | 2,890 kN |
| Power Data | | |
| Installed Power | 9,430 hp | 7,040 kW |
| Fuel Capacity | 162,000 gal | 613,170 l |



In New York/New Jersey Harbor: The Chicago was the primary dredging tool used in the deepening of New York New Jersey Harbor, the largest dredging contract in the history of the U.S. Army Corps of Engineers.



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Chicago as a Clamshell (Grab) Dredge



The Chicago offshore at Mobile, Alabama, on her first major project. Great Lakes' leadership in the clamshell (grab) dredging market is a result of the company's commitment to build and maintain the finest, most efficient equipment.

The dredge *Chicago* can operate both as a clamshell (grab) and as a dipper dredge.

The *Chicago* is the world's largest and most productive clamshell dredge.

- Operates with:
 - 50-yd³ (38-m³) bucket for mud excavation
 - 40-yd³ (31-m³) bucket for firmer material
 - 30-yd³ (23-m³) heavy-duty bucket for hard digging
- Operates with as many as four 6,000-yd³ (4,600-m³) bottom-dump barges.
- Is ideally suited for high-production work with long-distance disposal
- Incorporates state-of-the-art positioning system and production-monitoring instrumentation



The Chicago's 6,000-yd³ (4,600-m³) bottom-dump barges are suited for long-haul, high-volume projects. Shown above is a barge fully loaded, en route to a disposal area.

Chicago as a Clamshell Dredge



The Chicago in operation as a clamshell.

Certification

ABS International Loadline

| | Imperial | Metric |
|-----------------------|--------------------------|-------------------------|
| Dimensions | | |
| Hull | 223 x 75 x 15 ft | 68 x 23 x 4.5 m |
| Draft | 10.5 ft | 3.2 m |
| Bucket Size | 30 to 50 yd ³ | 23 to 38 m ³ |
| Performance | | |
| Maximum Digging Depth | | |
| On Spuds | 80 ft | 24 m |
| On Anchors | 160 ft | 49 m |
| Linepull | 220,000 lbs @ 375 fpm | 980 kN @ 114 mpm |
| Stallpull | 295,000 lbs | 1,290 kN |
| Power Data | | |
| Installed Power | 9,430 hp | 7,040 kW |
| Fuel Capacity | 162,000 gal | 613,170 l |



As a dipper dredge, the Chicago can dig in unblasted rock, though she more frequently works in conjunction with Great Lakes' fleet of drill boats, removing rock that has been broken by drilling and blasting.



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Dredges No. 52 & 54



Dredges No. 52 and 54 at work in the Tolchester Channel entrance to Baltimore Harbor.

The built-in dredging capabilities and power of these dredges make them some of the largest, most efficient equipment of their kind in the world.

Applications

- Open channel excavation
- Pier and dock excavation
- Pipeline crossings and tunnel excavations
- New harbor work
- Maintenance dredging

Operation

- These dredges operate with:
 - 26-yd³ (20-m³) bucket for mud excavation
 - 21-yd³ (16-m³) bucket for firmer material
 - 12-yd³ (9-m³) bucket for sand and hard materials
- Dredges No. 52 and 54 work in conjunction with Great Lakes' fleet of six 3,000- and six 4,000-yd³ (2,300- and 3,060-m³) dump barges on projects involving off-shore bottom-dump disposal
- The control systems of these dredges feature computerized positioning and production monitoring.



A 200-foot boom suits Dredge No. 54 for long side-casting jobs.

Dredges No. 52 & 54



Pipeline crossing: Dredge No. 54 excavates material from the bottom of Long Island Sound for a gas pipeline. The material was sidecast, later to be rehandled in covering the pipeline. Electronic positioning and production monitoring equipment aid in this precise work.

Dredge No. 52

Certification

ABS International Loadline
U.S. Coast Guard Certificate of Inspection

| | Imperial | Metric |
|--------------------|--------------------------|------------------------|
| Dimensions | | |
| Hull | 165 x 50 x 10.5 ft | 50 x 15 x 3.2 m |
| Draft | 6.8 ft | 2.1 m |
| Bucket Size | 12 to 26 yd ³ | 9 to 20 m ³ |
| Performance | | |
| Digging Depth | | |
| On Spuds | 65 ft | 20 m |
| On Anchors | 150 ft | 46 m |
| Linepull | 96,000 lbs | 427 kN |
| | @ 290 fpm | @ 88 mpm |
| Stallpull | 150,000 lbs | 670 kN |
| Power Data | | |
| Installed Power | 1,745 hp | 1,300 kW |
| Fuel Capacity | 25,400 gal | 96,140 l |

Dredge No. 54

Certification

ABS International Loadline
U.S. Coast Guard Certificate of Inspection

| | Imperial | Metric |
|--------------------|--------------------------|------------------------|
| Dimensions | | |
| Hull | 185 x 60 x 11 ft | 56 x 18 x 3.4 m |
| Draft | 6.1 ft | 1.9 m |
| Bucket Size | 12 to 26 yd ³ | 9 to 20 m ³ |
| Performance | | |
| Digging Depth | | |
| On Spuds | 74 ft | 23 m |
| On Anchors | 150 ft | 46 m |
| Linepull | 107,000 lbs | 476 kN |
| | @ 360 fpm | @ 110 mpm |
| Stallpull | 175,000 lbs | 780 kN |
| Power Data | | |
| Installed Power | 2,340 hp | 1,750 kW |
| Fuel Capacity | 39,400 gal | 149,130 l |

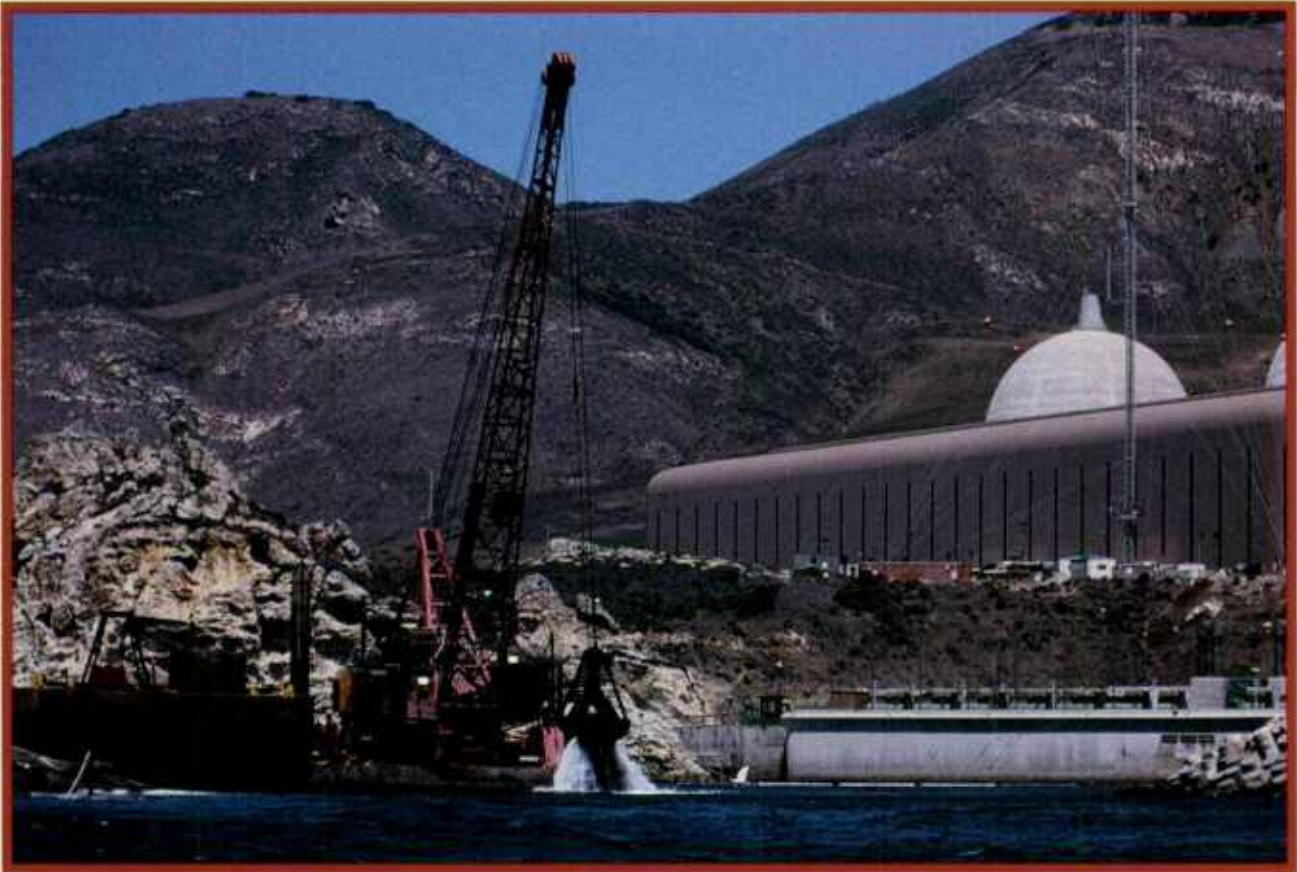


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Dredge No. 53



Clamshell Dredge No. 53 is shown above working on storm damage repairs at a power plant. Submarine structures dictated extreme caution. Below, she sidecasts material while excavating an entrance channel at California's Vandenberg Air Force Base, also a sensitive environment. Great Lakes' pool of highly trained operating personnel routinely performs such careful work.

This clamshell (grab) dredge was designed by Great Lakes and built for use with our fleet of six 3,000- and six 4,000-yd³ (2,300- and 3,060-m³) barges for off-shore bottom dump disposal.

Applications

- Open channel excavation
- Pier and dock excavation
- Pipeline crossings and tunnel excavations
- New work in harbors and routine maintenance dredging
- Nearshore ocean work

Operation

This dredge operates with:

- 21- and 26-yd³ (16- and 20-m³) buckets for mud excavation
- 18-yd³ (14-m³) bucket for firmer material
- 10- and 15-yd³ (7.6- and 11.5-m³) buckets for sand and hard materials
- Electronic positioning and control systems



Dredge No. 53



Port Maintenance: Dredge No. 53 at work maintaining the Port of Anchorage, Alaska.

Certification

ABS International Loadline

| | Imperial | Metric |
|--------------------|--|----------------------------------|
| Dimensions | | |
| Hull | 165 x 60 x 10.3 <i>ft</i> | 50 x 18 x 3.1 <i>m</i> |
| Draft | 6.0 <i>ft</i> | 1.8 <i>m</i> |
| Bucket Size | 10 to 26 <i>yd</i> ³ | 7.6 to 20 <i>m</i> ³ |
| Performance | | |
| Digging Depth | | |
| Spuds | 60 <i>ft</i> | 18 <i>m</i> |
| Anchors | 150 <i>ft</i> | 46 <i>m</i> |
| Linepull | 100,000 <i>lbs</i> @ 318 <i>fpm</i> | 450 <i>kN</i> @ 97 <i>mpm</i> |
| Stallpull | 166,000 <i>lbs</i> | 737 <i>kN</i> |
| Power Data | | |
| Installed Power | 2,550 <i>hp</i> | 1,900 <i>kW</i> |
| Fuel Capacity | 100,500 <i>gal</i> | 380,390 <i>l</i> |



Joint work: Dredge No. 53 is shown in San Francisco Harbor performing maintenance work. The company's trailing suction hopper dredge Padre Island is dredging material on the dock's outer side.



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Dredges No. 50 & 51



Dredge No. 51 prepares for a maintenance dredging project on the Schuylkill River near Philadelphia.

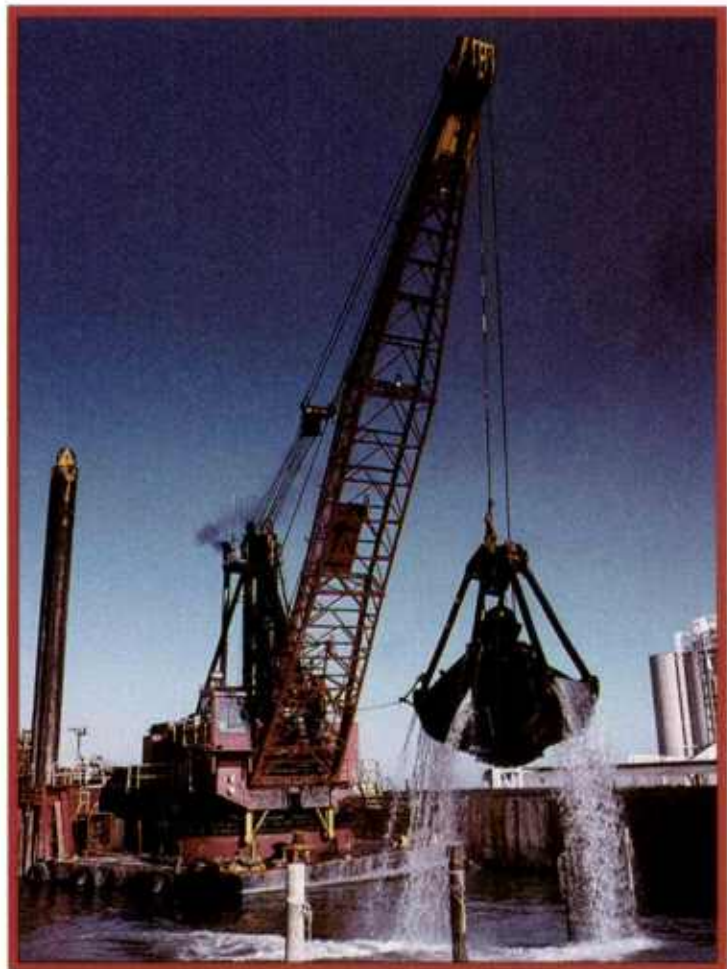
These clamshell (grab) dredges of the Great Lakes fleet are suitable for smaller maintenance and capital projects, such as pier dredging and pipeline crossings.

Applications

- Open channel excavation
- Pier and dock excavation
- Pipeline crossings and tunnel excavations
- New work in harbors and routine maintenance dredging

Operation

- These dredges operate with:
 - 15- and 18-yd³ (12- and 14-m³) bucket for mud excavation
 - 14-yd³ (11-m³) bucket for firmer material
 - 7- and 9-yd³ (5- and 7-m³) bucket for sand and hard materials
- They work in conjunction with Great Lakes' fleet of 2,000- and 3,000-yd³ (1,530- and 2,300-m³) bottom-dump barges on projects involving off-shore disposal
- Both dredges operate with electronic positioning equipment



Careful Maintenance: Dredge No. 50 works inside a Canaveral, Florida, marina.

Dredges No. 50 & 51



Great Lakes Clamshell Dredges No. 50, 51 and 52 at work deepening the approach channels to Baltimore Harbor.

Dredge No. 50

Certification

ABS Ocean Loadline

| | Imperial | Metric |
|-----------------------|---------------------------------------|----------------------------------|
| Dimensions | | |
| Hull | 130 x 50 x 10 <i>ft</i> | 40 x 15 x 3 <i>m</i> |
| Draft | 6.5 <i>ft</i> | 2.0 <i>m</i> |
| Bucket Size | 7 to 18 <i>yd</i> ³ | 5 to 14 <i>m</i> ³ |
| Performance | | |
| Maximum Digging Depth | | |
| On Spuds | 57 <i>ft</i> | 17 <i>m</i> |
| On Anchors | 150 <i>ft</i> | 46 <i>m</i> |
| Linepull | 60,000 <i>lbs</i> @ 210 <i>fpm</i> | 267 <i>kN</i> @ 64 <i>mpm</i> |
| Stallpull | 125,000 <i>lbs</i> | 556 <i>kN</i> |
| Power Data | | |
| Installed Power | 1,260 <i>hp</i> | 940 <i>kW</i> |
| Fuel Capacity | 30,000 <i>gal</i> | 113,550 <i>l</i> |

Dredge No. 51

Certification

ABS Ocean Loadline

| | Imperial | Metric |
|-----------------------|---------------------------------------|-----------------------------------|
| Dimensions | | |
| Hull | 155 x 44 x 9 <i>ft</i> | 47 x 13 x 3 <i>m</i> |
| Draft | 6.3 <i>ft</i> | 1.9 <i>m</i> |
| Bucket Size | 7 to 18 <i>yd</i> ³ | 5 to 14 <i>m</i> ³ |
| Performance | | |
| Maximum Digging Depth | | |
| On Spuds | 58 <i>ft</i> | 18 <i>m</i> |
| On Anchors | 120 <i>ft</i> | 37 <i>m</i> |
| Linepull | 80,000 <i>lbs</i> @ 360 <i>fpm</i> | 356 <i>kN</i> @ 110 <i>mpm</i> |
| Stallpull | 140,000 <i>lbs</i> | 623 <i>kN</i> |
| Power Data | | |
| Installed Power | 1,890 <i>hp</i> | 1,410 <i>kW</i> |
| Fuel Capacity | 13,500 <i>gal</i> | 51,100 <i>l</i> |



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Boston



The convertible Boston as a clamshell dredge in New York Harbor.

The dredge *Boston* operates both as a clamshell (grab) and as a dipper dredge. This convertibility makes her ideal for use in remote locations where both hard and soft materials will be encountered and where the expense of mobilizing two pieces of equipment would be prohibitive.

The *Boston* works in combination with 2,000-yd³ (1,530-m³) rock barges, or 3,000- and 4,000-yd³ (2,300- and 3,060-m³) barges for long-haul bottom-dump disposal.

Operation

- Operates in conjunction with the Great Lakes fleet of drillboats to remove drilled and blasted rock
- In the dipper mode, the dredge uses a:
 - 14-yd³ (11-m³) bucket for hard material
 - 9-yd³ (7-m³) bucket for digging blasted rock
- In the clamshell (grab) mode, the dredge uses:
 - 21-yd³ (16-m³) bucket for mud excavation
 - 18-yd³ (14-m³) bucket firmer material
 - 14-yd³ (11-m³) bucket for sand and hard materials
- The control systems of this dredge include an electronic positioning system



In dipper mode, the Boston works in Dubai on the Jebel Ali project.

Boston



Loading rock in the United Arab Emirates. Below, the Boston places material in a 3,000-yd³ (2,300 m³) material barge.

Certification

ABS International Loadline

| | Imperial | Metric |
|-------------------|--------------------------|------------------------|
| Dimensions | | |
| Hull | 140 x 50 x 12.5 ft | 43 x 15 x 4 m |
| Draft | 9.8 ft | 3.0 m |
| Bucket Size | 10 to 22 yd ³ | 8 to 17 m ³ |

Performance

| | | |
|-------------------------------|-------------------------|--------------------|
| Digging Depth, Clamshell Mode | | |
| On Spuds | 60 ft | 18 m |
| On Anchors | 100 ft | 31 m |
| Digging Depth, Dipper Mode | | |
| | 47 ft | 14 m |
| Linepull | 85,000 lbs @ 275 fpm | 380 kN @ 84 mpm |
| Stallpull | 180,000 lbs | 800 kN |

Power Data

| | | |
|-----------------|------------|-----------|
| Installed Power | 2,050 hp | 1,530 kW |
| Fuel Capacity | 51,000 gal | 193,035 l |

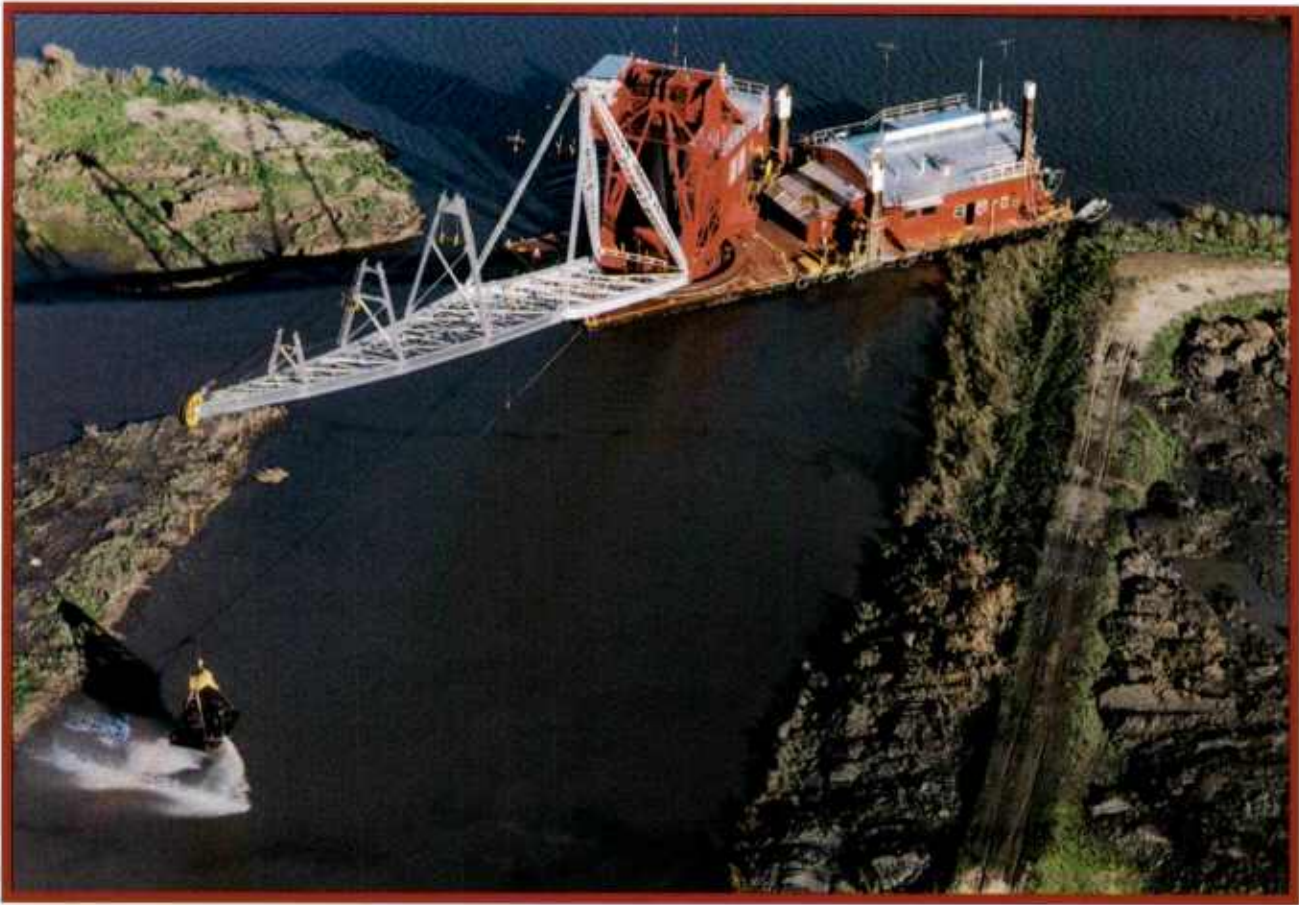


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Conical



The Conical at work on the storm protection system on the Bayou Lafourche in Louisiana.

The 240-ft (71-m) boom of the *Conical* was specifically designed for sidecasting of material within a working radius of 235 feet.

Specifications

| | Imperial | Metric |
|-----------------------|-------------------------|-------------------------|
| Dimensions | | |
| Hull* | 150 x 51 x 9 ft | 46 x 16 x 2.7 m |
| Draft | 6.1 ft | 1.9 m |
| Boom Length | 240 ft | 71 m |
| Bucket Size | 6 to 12 yd ³ | 4.5 to 9 m ³ |
| Performance | | |
| Digging Depth (Spuds) | 35 ft | 11 m |
| Working Radius | 235 ft | 72 m |
| Linepull | 58,000 lbs @ 125 fpm | 256 kN @ 38 mpm |
| Stallpull | 120,000 lbs | 534 kN |
| Power Data | | |
| Installed Power | 1,015 hp | 757 kW |
| Fuel Capacity | 37,000 gal | 140,000 l |

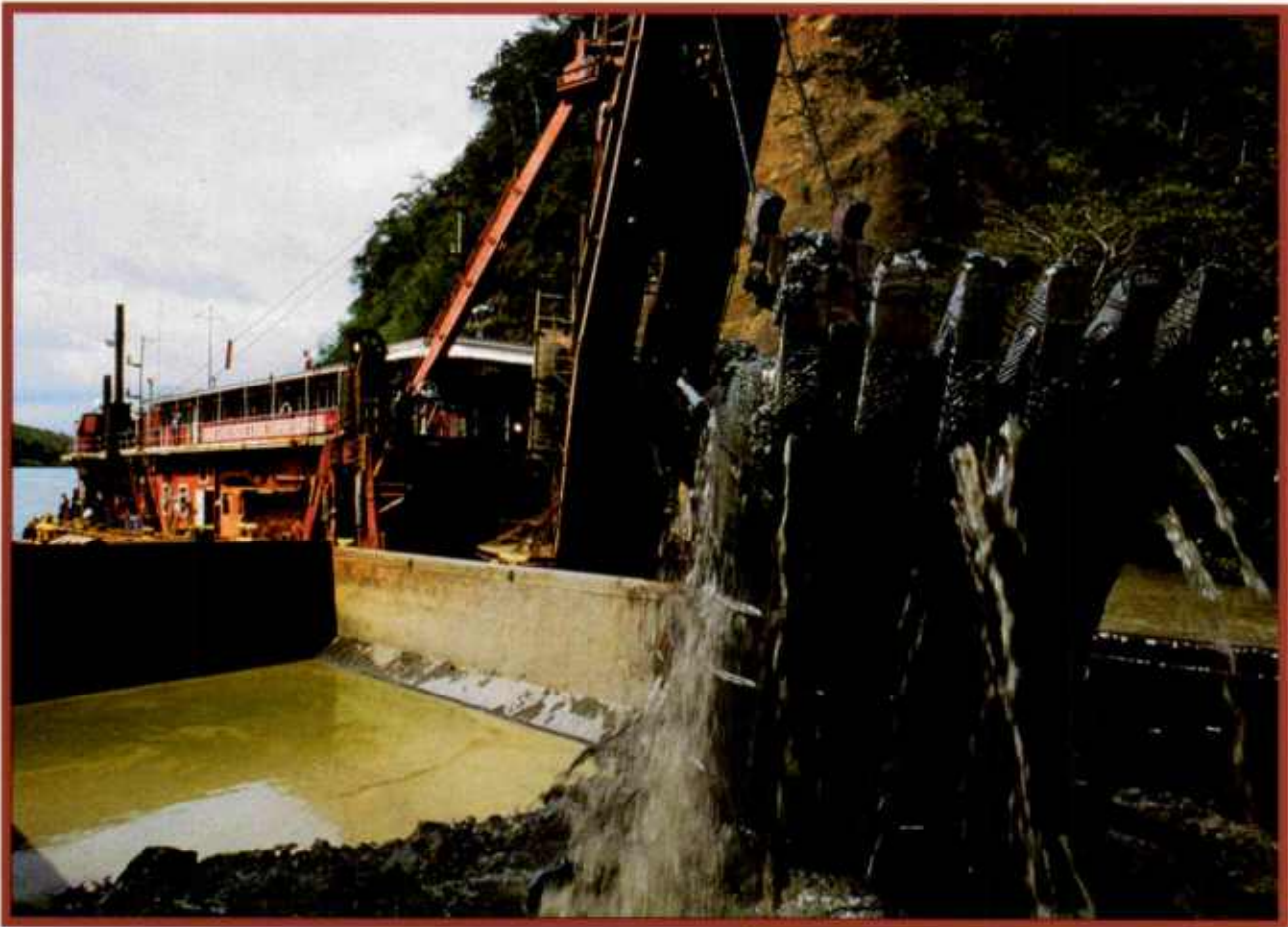


The Conical has built much of the levee system that surrounds New Orleans, Louisiana. The city lies as low as 17 feet below mean low water, and is under constant threat from floods on the Mississippi River and the storm waters of the Gulf of Mexico.

*With her stabilizing outrigger barges, the *Conical* measures 150 x 75 x 9 ft.



Mogul



The Mogul was among the equipment dispatched to the Panama Canal to remove material from the Gaillard Cut. Below, she is at work in the Kill Van Kull in New York Harbor.

Specifications

| | Imperial | Metric |
|--------------------|-------------------------|-----------------------|
| Dimensions | | |
| Hull | 156 x 42.5 x 13 ft | 48 x 13 x 4 m |
| Draft | 10 ft | 3.0 m |
| Bucket Size | 9 to 12 yd ³ | 7 to 9 m ³ |
| Performance | | |
| Digging Depth | 59 ft | 18 m |
| Hoist Pull | 83,300 lb @ 198 fpm | 371 kW @ 60 mpm |
| Dig Pull | 180,000 lb @ 117 fpm | 800 kN @ 36 mpm |
| Stall Pull | 244,000 lb | 1,085 kN |
| Power Data | | |
| Installed Power | 1,300 hp | 992 kW |
| Cutter Power | 425 hp | 317 kW |
| Fuel Capacity | 91,000 gal | 344,450 l |





Long Island



The Long Island mining material at Ocean City. Below, the dredge at work in the New York City area.

The trailing suction hopper dredge *Long Island* is the largest such dredge operating in U.S. waters. Her 16,000-yd³ (12,200-m³) capacity makes her an economic tool for land reclamation and beach nourishment projects.

She is propelled by the 5,450-hp (4,064-kW) tug *Colnon*, which fits into a notch at the stern of the dredge. Stern and bow thrusters aid in maneuvering the barge.

The *Long Island* can be equipped with bottom doors for bottom dumping. Alternatively, the dredge can pump out material, using two 6,000-hp (4,480-kW) inboard pumps. For offshore applications, the dredge pumps out through the use of a SCOTS buoy (shown overleaf). The dredge has four hoppers, each with two monitor jets to aid in unloading.

The *Long Island* has been used to economically pump sand as far as 17,500 ft (5,300 m) without the aid of booster pumps.



Long Island



Pump-Out: The Long Island discharges sand for the beach at Ocean City through a Self-Contained Offshore Transport System (SCOTS) Buoy (below), which is connected to a submerged pipeline running to the beach. At bottom, a discharge site at Ocean City.

Certification

ABS A1 Dredging Service, Coastwise

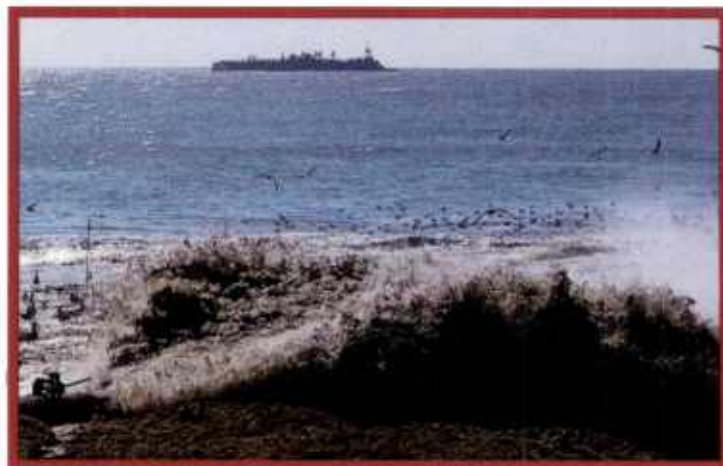
| | Imperial | Metric |
|--------------------|------------------|-----------------|
| Dimensions | | |
| Hull | 510 x 75 x 34 ft | 155 x 23 x 10 m |
| Draft | | |
| Light | 7.0 ft | 2.1 m |
| Loaded | 29 ft | 8.8 m |
| Suction Diameter | 33 in | 840 mm |
| Discharge Diameter | 30 in | 760 mm |

Performance

| | | |
|-------------------------------|------------------------|-----------------------|
| Hopper Capacity | 16,000 yd ³ | 12,200 m ³ |
| Nominal Maximum Digging Depth | | |
| | 80+ ft | 24.4+ m |

Power Data

| | | |
|-----------------------|------------|-----------|
| Installed Power | 14,700 hp | 10,960 kW |
| Fuel Capacity | 84,000 gal | 317,940 l |
| Tug Propulsion | 5,450 hp | 4,064 kW |
| Bow & Stern Thrusters | | |
| | 1,000 hp | 745 kW |



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Dodge Island



The Dodge Island under way with a full load of material.

The split-hull trailing suction hopper dredge *Dodge Island* can dispose of dredged material by bottom-dumping, but can also discharge material through its on-board pump system.

The dredge is well suited to work in harbors and inland waterways as well as in unprotected waters. A bow thruster augments her twin-screw propulsion system. Her shallow draft and high maneuverability allow operation in relatively tight quarters.

The *Dodge Island* is equipped with state-of-the-art dredging production and operations monitoring instrumentation and an electronic positioning system.

Applications

- New harbor development and improvement
- Maintenance of channels and harbors
- Beach nourishment
- Land reclamation
- Aggregates mining

Norfolk, Virginia: The Dodge Island splits her hull to bottom-dump material.



Dodge Island



The Dodge Island performs maintenance dredging in the Great Lakes Port of Rochester, N.Y. Her lever room, below, features state-of-the-art electronic control systems. At bottom, one of the dredge's 2,150-hp (1,610-kW) main propulsion engines.

Certification

U.S. Coast Guard Unlimited Oceans
ABS International Loadline

| | Imperial | Metric |
|--------------------|------------------|-----------------|
| Dimensions | | |
| Hull | 281 x 53 x 22 ft | 86 x 16 x 6.6 m |
| Draft | | |
| Light | 9.5 ft | 2.9 m |
| Loaded | 19.5 ft | 5.9 m |
| Suction Diameter | 27 in | 690 mm |
| Discharge Diameter | 24 in | 610 mm |

Performance

| | | |
|-------------------------------|-----------------------|----------------------|
| Hopper Capacity | 3,600 yd ³ | 2,750 m ³ |
| Nominal Maximum Digging Depth | 70+ ft | 21.3+ m |

Power Data

| | | |
|-----------------|-------------|-----------|
| Installed Power | 9,395 hp | 7,010 kW |
| Fuel Capacity | 107,800 gal | 408,000 l |



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Sugar Island



The Sugar Island at work. Below, she demonstrates how close to docks she and her sister dredges can work. At bottom, the Sugar Island is shown with the Manhattan Island and the Dodge Island.

The split-hull trailing suction hopper dredge *Sugar Island* can dispose of dredged material by bottom-dumping, but can also discharge material through its on-board pump system.

The dredge is well suited to work in harbors and inland waterways as well as in unprotected waters. A bow thruster augments her twin-screw propulsion system. Her shallow draft and high maneuverability allow operation in relatively tight quarters.

The *Sugar Island* is equipped with state-of-the-art dredging production and operations monitoring instrumentation and an electronic positioning system.

Applications

- New harbor development and improvement
- Maintenance of channels and harbors
- Beach nourishment
- Land reclamation
- Aggregates mining



Sugar Island



The Sugar Island en route to a disposal site. Below, at Pt. Mouillée State Park, Michigan, she pumps material to an upland disposal area.

Certification

U.S. Coast Guard Unlimited Oceans
ABS International Loadline

Imperial Metric

Dimensions

| | | |
|--------------------|--------------------|-----------------|
| Hull | 281 x 53 x 21.5 ft | 86 x 16 x 6.6 m |
| Draft | | |
| Light | 9.5 ft | 2.9 m |
| Loaded | 19.5 ft | 5.9 m |
| Suction Diameter | 27 in | 690 mm |
| Discharge Diameter | 24 in | 610 mm |

Performance Data

| | | |
|-------------------------------|-----------------------|----------------------|
| Hopper Capacity | 3,600 yd ³ | 2,750 m ³ |
| Nominal Maximum Digging Depth | 70+ ft | 21.3+ m |

Power Data

| | | |
|-----------------|------------|-----------|
| Installed Power | 9,395 hp | 7,010 kW |
| Fuel Capacity | 84,000 gal | 317,940 l |



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Padre Island



The Padre Island en route to a disposal area. Below, some sister vessels, the Manhattan Island, the Sugar Island, and the Dodge Island.

The split-hull trailing suction hopper dredge *Padre Island* disposes of dredged material by bottom-dumping. The dredge is well suited to work in harbors and inland waterways as well as in unprotected waters. A bow thruster augments her twin-screw propulsion system. Her shallow draft and high maneuverability allow operation in relatively tight quarters.

The *Padre Island* is equipped with state-of-the-art dredging production and operations monitoring instrumentation and an electronic positioning system.

Applications

- New harbor development and improvement
- Maintenance of channels and harbors



Padre Island



The Padre Island at work. Below, the dredge removes material near the shore at Portete Bay, Colombia.

Certification

U.S. Coast Guard Unlimited Oceans
 ABS International Loadline

Imperial Metric

Dimensions

| | | |
|--------------------|--------------------|-----------------|
| Hull | 281 x 53 x 21.5 ft | 86 x 16 x 6.6 m |
| Draft | | |
| Light | 9.5 ft | 2.9 m |
| Loaded | 19.5 ft | 5.9 m |
| Suction Diameter | 27 in | 690 mm |
| Discharge Diameter | 24 in | 610 mm |

Performance

| | | |
|-------------------------------|-----------------------|----------------------|
| Hopper Capacity | 3,600 yd ³ | 2,750 m ³ |
| Nominal Maximum Digging Depth | 70+ ft | 21.3+ m |

Power Data

| | | |
|-----------------|-------------|-----------|
| Installed Power | 7,530 hp | 5,620 kW |
| Fuel Capacity | 128,200 gal | 485,200 l |



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Manhattan Island



The Manhattan Island en route to a dredging site (above). Below, she disposes of material via direct bottom dumping.

The split-hull trailing suction hopper dredge *Manhattan Island* disposes of dredged material by direct bottom-dumping. The dredge is well suited to work in harbors and inland waterways as well as in unprotected waters. A bow thruster augments her twin-screw propulsion system. Her shallow draft and high maneuverability allow operation in relatively tight quarters.

The *Manhattan Island* is equipped with state-of-the-art dredging production and operations monitoring instrumentation and an electronic positioning system.

Applications

- New Harbor development and improvement
- Maintenance of channels and harbors



Manhattan Island



The Manhattan Island in San Francisco Bay (above), and with her sister vessels, the Sugar Island and Dodge Island (below).

Certification

U.S. Coast Guard Unlimited Oceans
ABS International Loadline

| | |
|-----------------|---------------|
| Imperial | Metric |
|-----------------|---------------|

Dimensions

| | | |
|--------------------|--------------------|-----------------|
| Hull | 281 x 53 x 21.5 ft | 86 x 16 x 6.6 m |
| Draft | | |
| Light | 9.5 ft | 2.9 m |
| Loaded | 19.5 ft | 5.9 m |
| Suction Diameter | 27 in | 690 mm |
| Discharge Diameter | 24 in | 610 mm |

Performance

| | | |
|-------------------------------|-----------------------|----------------------|
| Hopper Capacity | 3,600 yd ³ | 2,750 m ³ |
| Nominal Maximum Digging Depth | 70+ ft | 21.3+ m |

Power Data

| | | |
|-----------------|-------------|-----------|
| Installed Power | 7,085 hp | 5,290 kW |
| Fuel Capacity | 127,175 gal | 481,360 l |



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Northerly Island



The Northerly Island features integral pump-out as well as split-hull bottom-dump material disposal.

The split-hull trailing suction hopper dredge *Northerly Island* can dispose of dredged material by bottom-dumping, but can also pump out material through its on-board pump system.

The dredge is well suited to work in harbors and inland waterways as well as in unprotected waters. She operates with a twin-screw propulsion system. Her shallow draft and high maneuverability allow operation in relatively tight quarters.

The *Northerly Island* is equipped with state-of-the-art dredging production and operations monitoring instrumentation and an electronic positioning system.

Applications

- New Harbor development and improvement
- Maintenance of channels and harbors
- Beach nourishment
- Land reclamation
- Aggregates mining
- Shallow dredging



Northerly Island



The Northerly Island. Below, she removes material from a channel beside Ellis Island in New York Harbor.

Certification

U.S. Coast Guard Unlimited Oceans
 ABS A1 Dredging Service

| | Imperial | Metric |
|-------------------------------|------------------------------|-----------------------------|
| Dimensions | | |
| Hull | 205 x 48 x 17 <i>ft</i> | 63 x 15 x 5.2 <i>m</i> |
| Draft | | |
| Light | 5.1 <i>ft</i> | 1.6 <i>m</i> |
| Loaded | 15.3 <i>ft</i> | 4.7 <i>m</i> |
| Suction Diameter | 18 <i>in</i> | 460 <i>mm</i> |
| Discharge Diameter | 18 <i>in</i> | 460 <i>mm</i> |
| Performance | | |
| Hopper Capacity | 2,160 <i>yd</i> ³ | 1,650 <i>m</i> ³ |
| Nominal Maximum Digging Depth | 50+ <i>ft</i> | 15.2+ <i>m</i> |
| Power Data | | |
| Installed Power | 4,915 <i>hp</i> | 3,670 <i>kW</i> |
| Fuel Capacity | 130,000 <i>gal</i> | 491,900 <i>l</i> |



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Amboy Aggregates' *Sandy Hook*



The Sandy Hook returns to South Amboy loaded with material dredged from the Federal Channel.

The *Sandy Hook* was especially constructed for the purpose of mining sand and gravel for the aggregate construction market. She is a tug-integrated trailing suction hopper dredge, and is equipped with a 1,500-hp (1,120-kW) underwater pump mounted on her drag arm.

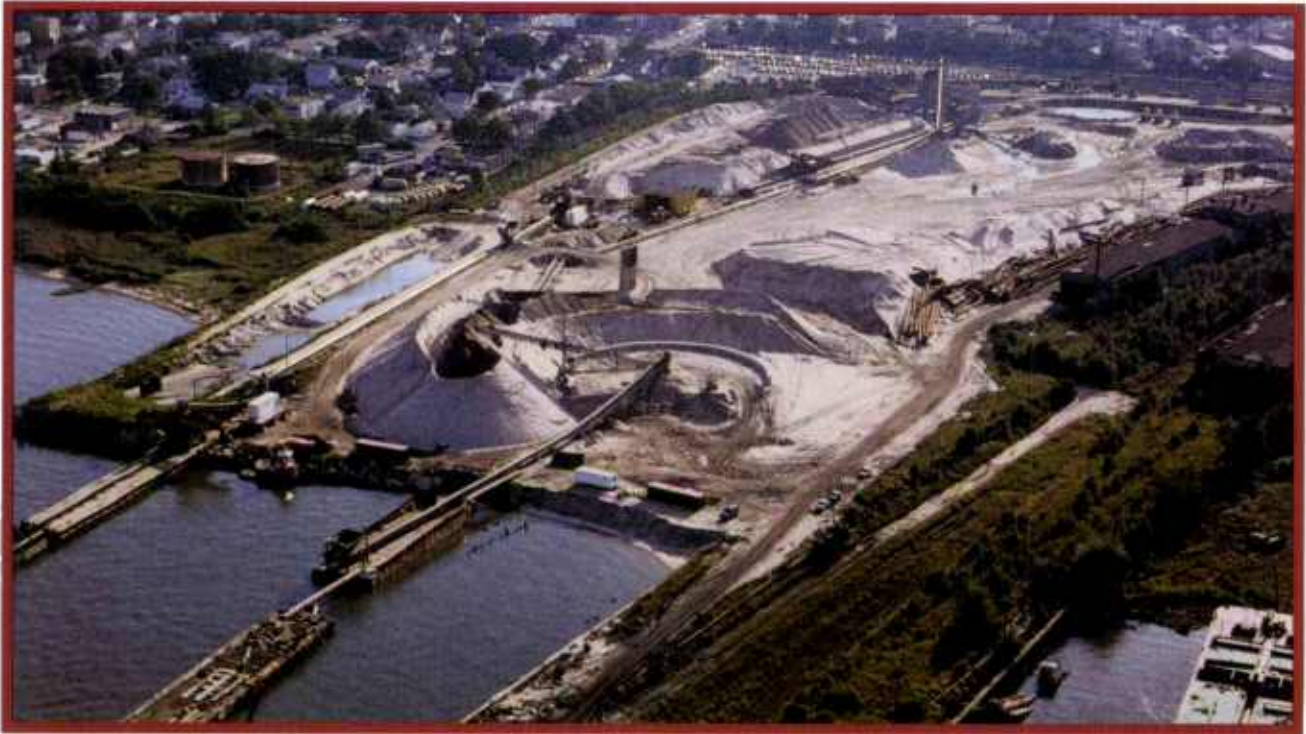
The *Sandy Hook* unloads materials dry by means of on-board bucket-conveyors that feed directly to a shore-based conveyor system.

Amboy Aggregates, of South Amboy, New Jersey, is a Great Lakes subsidiary that mines aggregate materials for processing and sale in the Northeastern U.S. market. It is the leading supplier of sand to the construction trade in New York City.



Material Transfer: The Sandy Hook nears the Amboy Aggregates dock with a load of material (above). Unloading is facilitated by a bucket system that feeds a shoreside conveyor.

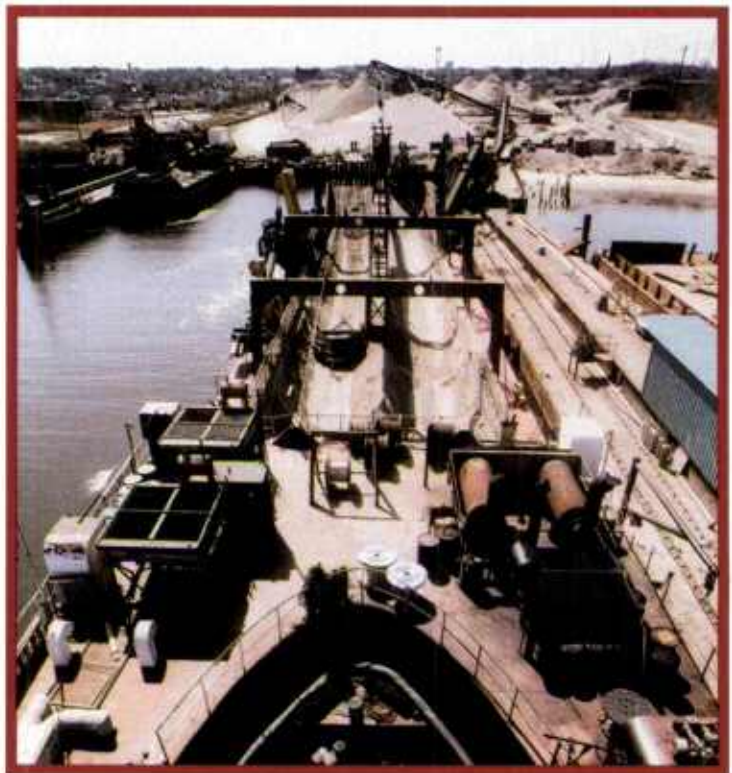
Amboy Aggregates' *Sandy Hook*



The Amboy Plant: The 30-acre facility has one berth for unloading and two berths for loading aggregate material, and can process up to 2 million yd³ (1.5 million m³) of sand per year. Below, unloading viewed from the upper deck of the tug that propels the Sandy Hook.

Specifications

| | Imperial | Metric |
|-------------------------------|------------------------------|-----------------------------|
| Dimensions | | |
| Hull | 295 x 60 x 21 <i>ft</i> | 90 x 18 x 6.4 <i>m</i> |
| Draft | | |
| Light | 5 <i>ft</i> | 1.5 <i>m</i> |
| Loaded | 20 <i>ft</i> | 6.1 <i>m</i> |
| Suction Diameter | 27 <i>in</i> | 690 <i>mm</i> |
| Discharge Diameter | 27 <i>in</i> | 690 <i>mm</i> |
| Performance Data | | |
| Hopper Capacity | 5,100 <i>yd</i> ³ | 3,900 <i>m</i> ³ |
| Nominal Maximum Digging Depth | 85 <i>ft</i> | 26 <i>m</i> |
| Power Data | | |
| Installed Power | 3,200 <i>hp</i> | 2,390 <i>kW</i> |
| Fuel Capacity | 57,800 <i>gal</i> | 217,770 <i>l</i> |



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Unloader No. 2 & the Rhode Island



Unloading Capacity: Unloader No. 2 (above) shown where it has done the bulk of the unloading work, at Hart-Miller Island, Chesapeake Bay, Maryland. Below left, a closer view. Below right, Unloader No. 2 setting up for operation in Philadelphia.



Specifications

| | Unloader No. 2 | | Rhode Island | |
|-----------------|------------------|-----------------|----------------|-----------------|
| | Imperial | Metric | Imperial | Metric |
| Hull Dimensions | 112 x 50 x 12 ft | 34 x 15 x 3.5 m | 76 x 35 x 5 ft | 23 x 11 x 1.5 m |
| Draft | 7.5 ft | 2.3 m | 3.2 ft | 1.0 m |
| Overall Length | 155 ft | 47 m | 110 ft | 34 m |
| Installed Power | 6,800 hp | 5,060 kW | 1,800 hp | 1,300 kW |
| Fuel Capacity | 104,000 gal | 394,000 l | 10,500 gal | 40,000 l |
| Diameters | | | | |
| Suction | 24 in | 610 mm | 16 in | 410 mm |
| Discharge | 24 in | 610 mm | 14 in | 360 mm |



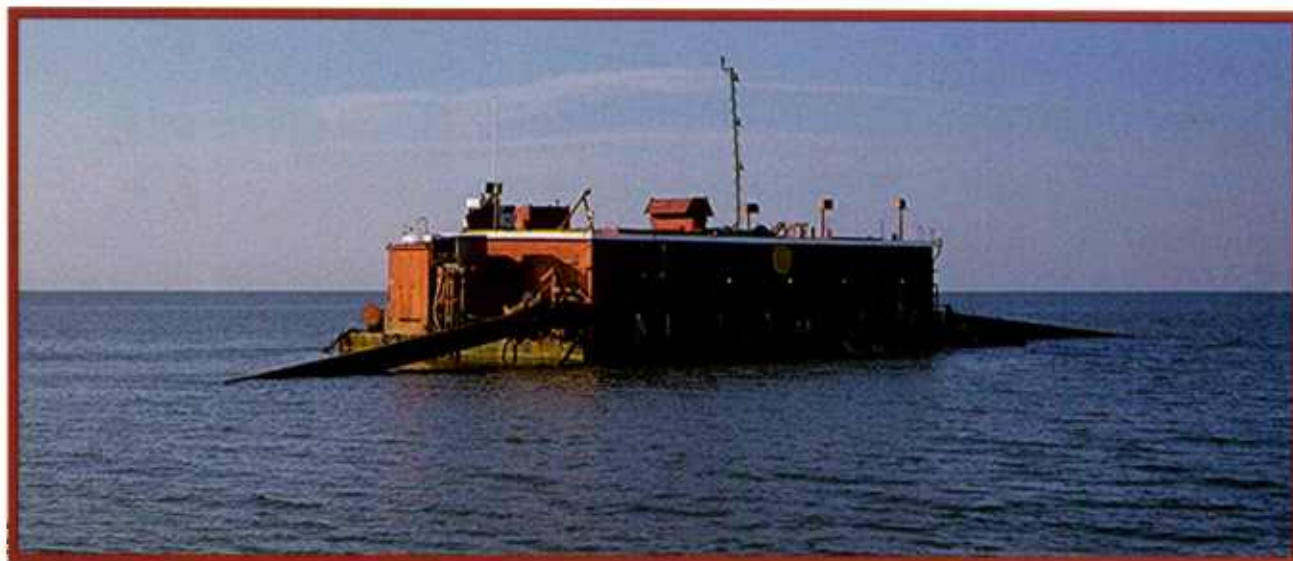
Booster Pumps



Jack-Up Booster, above, provides more than 4,600 hp (3,400 kW) for pumping material ashore. Her ability to float into position and jack up out of the water enables the booster to be used offshore in exposed waters. Below, Booster No. 2.

Specifications

| | | Hull Dimensions | Main Pump Power | Fuel Capacity | Diameter | |
|-----------------------------|----------|--------------------|--------------------|------------------|----------|-----------|
| | | | | | Suction | Discharge |
| Booster No. 1 (Jack-Up) | Imperial | 80 x 42 x 8 ft | 4,625 hp | 40,000 gal | 32 in | 27 in |
| | Metric | 24 x 13 x 2.4 m | 3,450 kW | 151,000 l | 810 mm | 690 mm |
| Booster No. 2 | Imperial | 94 x 45 x 8 ft | 7,800 hp | — | 30 in | 30 in |
| | Metric | 29 x 14 x 2.4 m | 5,850 kW | — | 760 mm | 760 mm |
| Booster No. 3 (Portable) | Imperial | 44 x 10 x 12 ft | 1,500 hp | — | 23 in | 19.5 in |
| | Metric | 13 x 3 x 3.7 m | 1,120 kW | — | 580 mm | 499 mm |





Drillboat No. 8 & the Algonquin

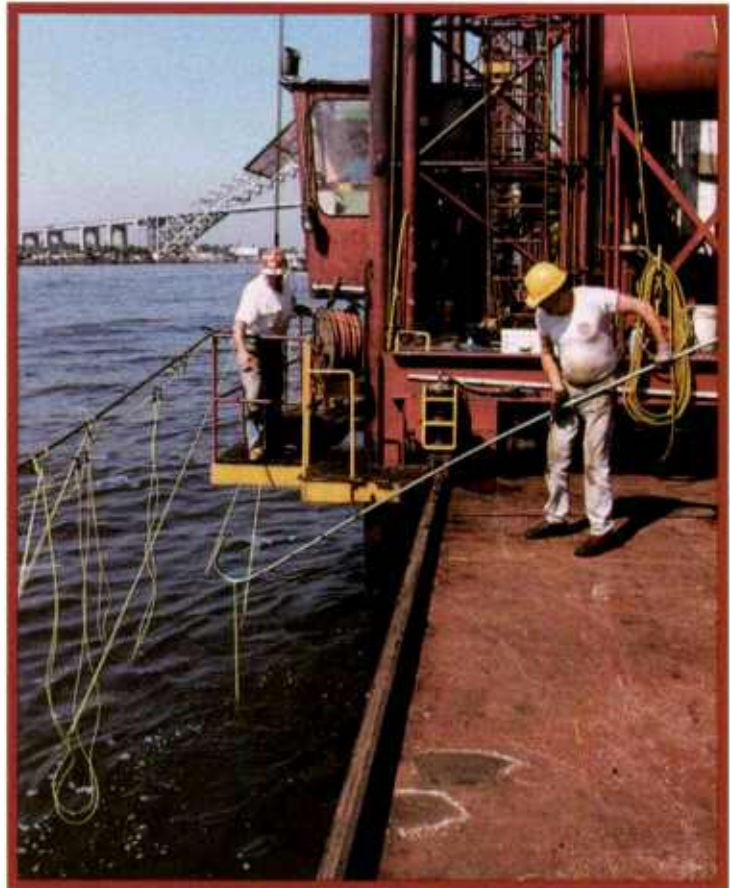


Drillboat No. 8 in New York Harbor: Two Great Lakes drillboats worked on the deepening of the Kill Van Kull, the largest dredging project in the history of the U.S. Army Corps of Engineers. The project required drilling and placement of more than 150,000 charges.

Drillboat No. 8, the Algonquin and their predecessors account in large part for Great Lakes' leadership in the field of blasting and removing underwater rock. The company has been involved in most major underwater rock blasting and removal projects in the United States, and is the leader in this market.

These drillboats define the state of the art in drillboat technology, including adjustable high-pressure hydraulic percussion drills, adjustable drill towers, and systems to charge and detonate high-safety gel explosives. Solid explosives may also be used with this equipment.

Through the use of advanced explosives technology, each blast is comprised of as many as 44 individual explosions, staggered in micro-second intervals to control shock-wave propagation through adjacent strata and minimize shoreside disturbance.



Drillboat crew members connect detonation lines to rows of drilled holes filled with explosive.

Drillboat No. 8 & the Algonquin



The Algonquin and Drillboat No. 8 at work in the Kill Van Kull Channel in New York Harbor.

Drillboat No. 8

| | Imperial | Metric |
|-----------------------|-------------------|-----------------|
| Dimensions | | |
| Hull | 175 x 42 x 8.3 ft | 53 x 13 x 2.5 m |
| Draft | 3.6 ft | 1.1 m |
| No. of Drill Frames | 3 | 3 |
| Tower Height | 90 ft | 27 m |
| Deck Travel | 118 ft | 36 m |
| No. of Spuds | 4 | 4 |
| Spud Length | 67 ft | 20 m |
| Performance | | |
| Maximum Hole Depth | 75 ft | 23 m |
| Maximum Hole Diameter | 5 in | 127 mm |
| Fuel Capacity | 10,200 gal | 38,600 l |

Drillboat Algonquin

| | Imperial | Metric |
|-----------------------|-------------------|-----------------|
| Dimensions | | |
| Hull | 135 x 50 x 9.6 ft | 41 x 15 x 2.9 m |
| Draft | 6.0 ft | 1.8 m |
| No. of Drill Frames | 3 | 3 |
| Tower Height | 90 ft | 27 m |
| Deck Travel | 112 ft | 34 m |
| No. of Spuds | 3 | 3 |
| Spud Length | 80 ft | 24 m |
| Performance | | |
| Maximum Hole Depth | 75 ft | 23 m |
| Maximum Hole Diameter | 5 in | 127 mm |
| Fuel Capacity | 15,700 gal | 59,425 l |

Note: Both drillboats use either liquid or solid explosives.



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The Great Lakes Tug Fleet



The Colnon



The Lemmerhirt



The O'Hara, the Biemeck & the McCormack Boys



The O'Hara



The Lowry

The Great Lakes Tug Fleet



The Pagendarm



The Lynn



A Workboat

IMPERIAL

| Tug | Hull Dimensions (ft) | Maximum Draft (ft) | Quarters | Fuel Capacity (gal) | Water Capacity (gal) | Propulsion (hp) | Speed Light (knots) |
|-----------------------------|----------------------|--------------------|----------|---------------------|----------------------|-----------------|---------------------|
| <i>William L. Colnon</i> | 135 x 30 | 18.5 | 14 | 184,000 | 14,200 | 5,450 | 12 |
| <i>Melvin E. Lemmerhirt</i> | 125 x 32 | 16.8 | 10 | 112,450 | 10,400 | 3,800 | 14 |
| <i>Frank C. Barker III</i> | 105 x 30 | 12.0 | 8 | 25,000 | 2,600 | 3,200 | 10 |
| <i>Arthur F. Zeman</i> | 83 x 27 | 10.0 | 8 | 25,000 | 2,000 | 2,350 | 12 |
| <i>Bruce J. Biemeck</i> | 76 x 27 | 11.5 | 8 | 17,500 | 2,500 | 2,000 | 9 |
| <i>McCormack Boys</i> | 76 x 27 | 11.5 | 8 | 17,500 | 2,500 | 2,000 | 9 |
| <i>Richard M. Lowry</i> | 71 x 24 | 12.0 | 8 | 30,100 | 2,600 | 1,800 | 8 |
| <i>Douglas B. Mackie</i> | 72 x 26 | 11.0 | 8 | 20,000 | 2,500 | 1,800 | 8 |
| <i>Delmur C. Lynn</i> | 94 x 27 | 10.6 | 16 | 14,750 | 14,500 | 1,640 | 12 |
| <i>William A. Lydon</i> | 108 x 26 | 13.0 | 19 | 20,500 | 2,000 | 1,600 | 10 |
| <i>Steven F. O'Hara</i> | 64 x 24 | 9.0 | 8 | 11,000 | 2,000 | 1,200 | 8 |
| <i>William F. Pagendarm</i> | 64 x 24 | 9.0 | 8 | 15,000 | 2,000 | 1,200 | 8 |
| <i>Paul R. Dickinson</i> | 65 x 22 | 9.5 | 4 | 19,000 | 10,000 | 800 | 10 |
| <i>Carl P. Metzler</i> | 55 x 17 | 5.5 | 4 | 4,500 | 1,700 | 480 | 10 |

METRIC

| Tug | Hull Dimensions (m) | Maximum Draft (m) | Quarters | Fuel Capacity (l) | Water Capacity (l) | Propulsion (kW) | Speed Light (knots) |
|-----------------------------|---------------------|-------------------|----------|-------------------|--------------------|-----------------|---------------------|
| <i>William L. Colnon</i> | 41.1 x 11.6 | 5.6 | 14 | 696,440 | 53,747 | 4,064 | 12 |
| <i>Melvin E. Lemmerhirt</i> | 38.1 x 9.8 | 5.1 | 10 | 425,623 | 39,364 | 2,834 | 14 |
| <i>Frank C. Barker III</i> | 32.0 x 9.1 | 3.7 | 8 | 94,625 | 9,841 | 2,386 | 10 |
| <i>Arthur F. Zeman</i> | 25.2 x 8.2 | 3.0 | 8 | 94,625 | 7,570 | 1,752 | 12 |
| <i>Bruce J. Biemeck</i> | 23.2 x 8.2 | 3.5 | 8 | 6,624 | 9,463 | 1,491 | 9 |
| <i>McCormack Boys</i> | 23.2 x 8.2 | 3.5 | 8 | 6,624 | 9,463 | 1,491 | 9 |
| <i>Richard M. Lowry</i> | 21.5 x 7.2 | 3.7 | 8 | 113,929 | 9,841 | 1,342 | 8 |
| <i>Douglas B. Mackie</i> | 21.5 x 7.9 | 3.4 | 8 | 75,700 | 9,463 | 1,342 | 8 |
| <i>Delmur C. Lynn</i> | 28.7 x 8.3 | 3.2 | 16 | 55,829 | 54,883 | 1,223 | 12 |
| <i>William A. Lydon</i> | 32.9 x 8.0 | 4.0 | 19 | 77,593 | 7,570 | 1,193 | 10 |
| <i>Steven F. O'Hara</i> | 19.5 x 7.3 | 2.7 | 8 | 41,635 | 7,570 | 894 | 8 |
| <i>William F. Pagendarm</i> | 19.5 x 7.3 | 2.7 | 8 | 56,775 | 7,570 | 894 | 8 |
| <i>Paul R. Dickinson</i> | 19.8 x 6.7 | 2.9 | 4 | 71,915 | 37,850 | 596 | 10 |
| <i>Carl P. Metzler</i> | 16.9 x 5.3 | 1.7 | 4 | 17,033 | 6,435 | 358 | 10 |



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Material Barge Fleet



A Vast Barge Fleet: Great Lakes owns a total of 43 material transport barges, ranging in size from the 6,000-yd³ (4,840-m³) unit above to 1,540-yd³ (1,175 m³) units. Their configurations include split-hull, bottom-dump, 6-, 7- and 8-pocket bottom door dumpers and miscellaneous hopper units.



A Versatile Barge Fleet: 1) One of Great Lakes' Series 90 2,000-yd³ (1,530-m³) rock barges loaded in New York Harbor. 2) A Series 60 6,000-yd³ (4,840-m³) barge splits its hull to dump material. 3) Series 60 barge working with the Dredge Chicago. 4) Series 30 4,000-yd³ (3,060-m³) barge with Dredge No. 54.

Material Barge Fleet



Loading/Unloading: At left, the hydraulic cutterhead Dredge Carolina loads rock into a Series 40 barge. At Hart-Miller Island, a Series 220 material barge is maneuvered into position for hydraulic unloading.

Imperial

| Barge | Hull Dimensions | | | Capacity (yd ³) | Draft | | Type |
|-------------------------|-----------------|---------------|---------------|--------------------------------|---------------|----------------|-------------|
| | Length (ft) | Width (ft) | Depth (ft) | | Light (ft) | Loaded (ft) | |
| 226 | 271 | 52 | 18 | 6,330 | 2.0 | 15.0 | hopper |
| 221, 222, 223, 224, 225 | 376 | 54 | 16 | 5,850 | 2.0 | 13.0 | hopper |
| 61, 62, 63, 64 | 277 | 64 | 27 | 6,000 | 3.8 | 22.8 | split hull |
| 30, 31, 32, 33, 34, 35 | 234 | 53 | 23 | 4,000 | 3.3 | 18.3 | split hull |
| 230, 231, 232 | 260 | 52 | 17 | 3,400 | 2.5 | 13.9 | hopper |
| 40, 41, 42, 43 | 235 | 45 | 21 | 3,010 | 3.0 | 18.0 | split hull |
| 44, 45 | 258 | 45 | 21 | 3,000 | 3.0 | 18.0 | split hull |
| 50, 60 | 224 | 43 | 15 | 2,020 | 5.0 | 14.5 | bottom door |
| 90, 91, 92, 93, 94, 95 | 235 | 45 | 16 | 2,000 | 5.0 | 13.5 | bottom door |
| 70, 71, 72 | 186 | 43 | 16 | 1,930 | 5.1 | 14.5 | bottom door |
| 5, 6, 8, 10 | 175 | 43 | 16 | 1,700 | 4.0 | 14.0 | bottom door |
| 54, 55, 56 | 223 | 42.5 | 15 | 1,540 | 5.0 | 12.5 | bottom door |

Metric

| Barge | Hull Dimensions | | | Capacity (m ³) | Draft | | Type |
|-------------------------|-----------------|--------------|--------------|-------------------------------|--------------|---------------|-------------|
| | Length (m) | Width (m) | Depth (m) | | Light (m) | Loaded (m) | |
| 226 | 83 | 16 | 5.5 | 4,840 | 0.6 | 4.6 | hopper |
| 221, 222, 223, 224, 225 | 115 | 17 | 4.9 | 4,470 | 0.6 | 4.0 | hopper |
| 61, 62, 63, 64 | 84 | 19 | 8.3 | 4,590 | 1.2 | 6.9 | split hull |
| 30, 31, 32, 33, 34, 35 | 71 | 16 | 7.0 | 3,060 | 1.0 | 5.6 | split hull |
| 230, 231, 232 | 79 | 16 | 5.2 | 2,600 | 0.8 | 4.2 | hopper |
| 40, 41, 42, 43 | 78 | 14 | 6.3 | 2,300 | 0.9 | 5.5 | split hull |
| 44, 45 | 79 | 14 | 6.2 | 2,300 | 0.9 | 5.5 | split hull |
| 50, 60 | 68 | 13 | 4.6 | 1,550 | 1.5 | 4.4 | bottom door |
| 90, 91, 92, 93, 94, 95 | 72 | 14 | 4.9 | 1,530 | 1.5 | 4.1 | bottom door |
| 70, 71, 72 | 57 | 13 | 4.9 | 1,475 | 1.6 | 4.4 | bottom door |
| 5, 6, 8, 10 | 53 | 13 | 4.9 | 1,300 | 1.2 | 4.3 | bottom door |
| 54, 55, 56 | 68 | 13 | 4.6 | 1,180 | 1.5 | 3.8 | bottom door |



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The Great Lakes Survey Fleet



Great Lakes' survey fleet provides the capability to verify bottom conditions before, during and after a project.

Great Lakes's 13-vessel survey fleet is equipped with state-of-the-art electronic positioning and survey equipment. Data on bottom conditions are gathered by survey boat and transferred to systems aboard the dredge fleet to give operators graphic displays of bottom contours relative to dredge position.

Each of the 13 vessels is equipped with the following gear to gather, integrate and record data:

- Del Norte Trisponder System
- Krupp Atlas Deso 20 Echo Sounder
- Hewlett Packard 9000 Series Computer
- HYNAT Survey System Software

Trailing Suction Hopper Dredge System

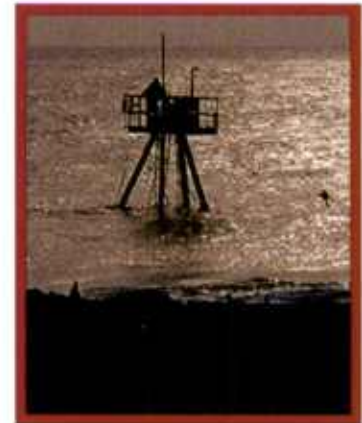
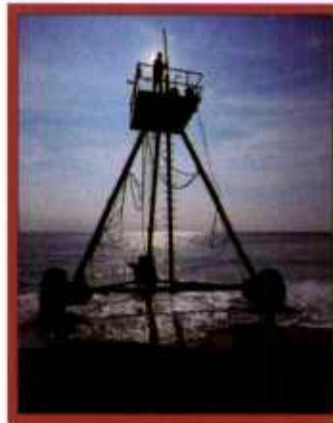
Additional data such as heading, drag head depth, and tide are provided to the dredge positioning computer by a Program Logic Controller (PLC). A real-time contoured plan-view display of dredge position with respect to channel limits is displayed on a monitor. Dredge and draghead coordinates may be stored at user-specified intervals.

Hydraulic Cutterhead Dredge System

System provides operator with a cross-sectional view of the position of the cutterhead and a plan-view of the location of the dredge. Dredge and cutterhead position can be stored at specified intervals.

Clamshell (Grab) Dredge System

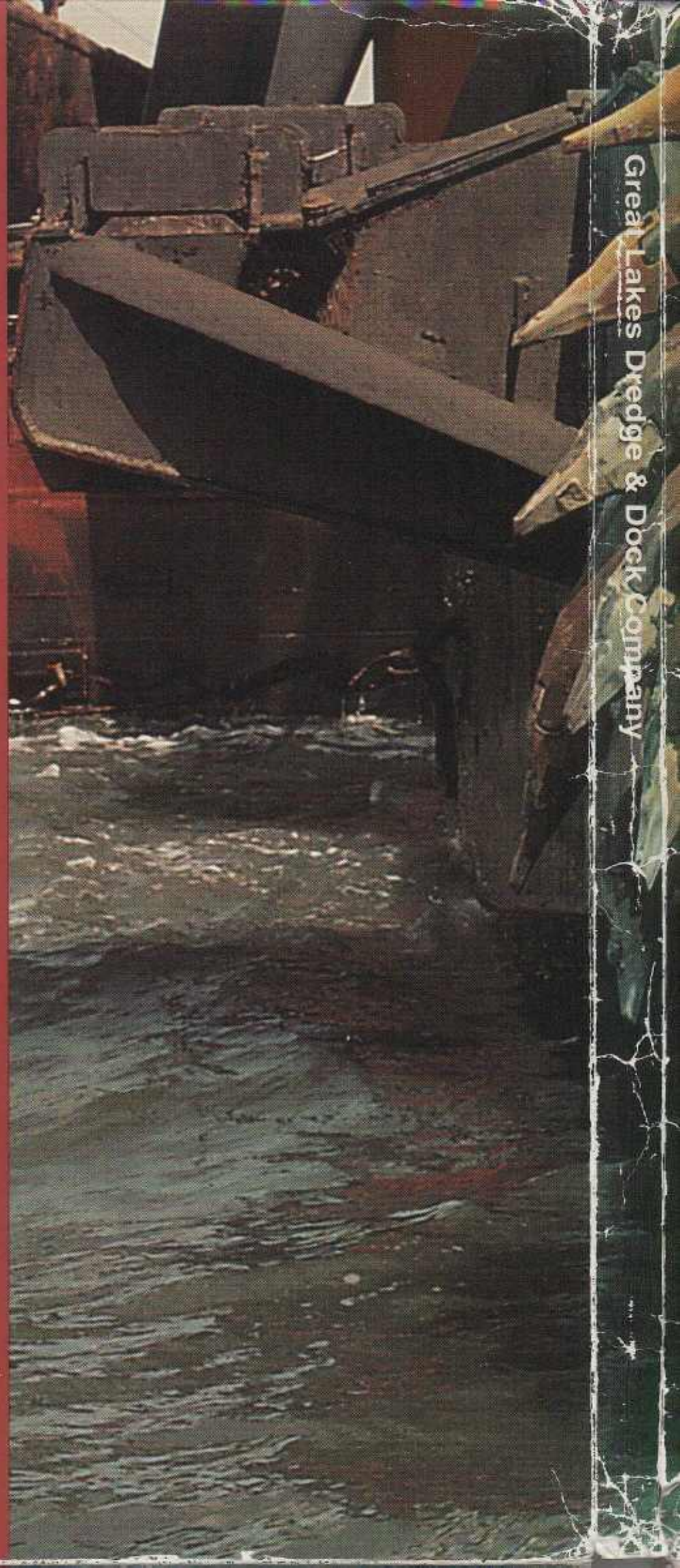
Operator is given a real-time graphic display of dredge and bucket position relative to a cross-sectional and plan view of the dredging template.



Great Lakes' survey fleet includes such specialized equipment as the Coastal Research Amphibious Buggy (CRAB), used to monitor near-shore profiles during beach nourishment projects.

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