DIYAR AL MUHARQAQ

Client: Kingdom of Bahrain  
Quantity: 80,000,000 cubic meters  
Dredge Types: Trailing Suction Hopper Dredge & Cutter Suction Dredge

This project, for the construction of the Diyar al Muharraq island system in the Kingdom of Bahrain, is one of the largest projects that Great Lakes has performed. The two-phase project called for the excavation and placement of some 80 million cubic meters of material, as a joint venture with AA Nass Contracting, who handled the rock works portion of the contract.

- Phase I: 35 million cubic meters of marine borrow material over a 36-month period to reclaim 6 million square meters of new land.
- Phase II: 45 million cubic meters of marine borrow material over a 36-month period to reclaim another 6 million square meters of land.

DURRAT AL BAHRAIN

Client: The Bahrain Government and Kuwait Finance House  
Dredge Type: Cutter Suction Dredge  
Dredges: Carolina, California, Utah & Alabama

The Durrat Al Bahrain resort construction project was completed through a joint venture between Great Lakes and AA Nass Contracting. The project involved the reclamation of over 6 million square meters of land for the creation of the resort, which consists of 13 islands, with over 2,000 villas and 2,000 apartments, with luxury hotels, restaurants, promenades, shopping centers, marina, spas, sports facilities and an 18-hole golf course.
**DURRAT MARINA**

*Client:* Durrat Khaleej al Bahrain  
*Quantity:* 6,900,000 cubic meters  
*Dredge Type:* Cutter Suction Dredge  
*Dredges:* Texas, California, Utah & Alabama

This project entailed dredging, reclamation and construction for a multi-use land development program. The large cutter suction dredges Texas and California performed the basic excavation and fill tasks for this project, with the smaller CSDs Alabama and Utah responsible for the detailed work and canal excavation. This work, and the rock-lined shore work by our subcontractor, required close coordination including several other types of floating and shore equipment. All told, 6.9 million cubic meters were excavated and placed.

**DARARI**

*Client:* Durrat Khaleej al Bahrain  
*Quantity:* 6,900,000 cubic meters  
*Dredge Type:* Cutter Suction Dredge  
*Dredges:* Texas, California, Utah & Alabama

This project entailed dredging, reclamation and construction for a multi-use land development program. The large cutter suction dredges Texas and California performed the basic excavation and fill tasks for this project, with the smaller CSDs Alabama and Utah responsible for the detailed work and some of the canal excavation. The circular canal was excavated in the dry with land equipment. This work, and the rock-lined shore work by our joint venture partner, required close coordination including several other types of floating and shore equipment. The project was complicated by the poor existing ground conditions at the start of the project, which entailed special measures and fill placement. All told, 6.9 million cubic meters were excavated and placed.

**WEST BAY LAGOON, DOHA, QATAR**

*Client:* Ministry of Municipal Affairs & Agriculture  
*Quantity:* 7,200,000 cubic meters  
*Dredge Type:* Cutter Suction Dredge  
*Dredge:* Illinois

The project was designed to transform a low-lying swamp area into a luxury residential lagoon development accommodating hundreds of housing lots, a hotel, conference center, sports and recreational facilities with extensive public beach access, marina facilities and protective breakwater structures. The offshore work was performed with the cutter suction dredge Illinois.
Client: Arab Shipbuilding and Repair Yard Co. (ASRY)
Quantity: 2,500,000 cubic meters
Dredge Type: Cutter Suction Dredge
Dredges: Carolina, Utah & Alabama

This project entailed expanding the berth and quay wall facilities for the Arab Shipbuilding and Repair Yard Co. (ASRY) shipyard in Bahrain. Project operations involved land excavation, bund construction, reclamation, disposal of unsuitable material, and precision dredging between freshly placed crane support pilings for a new quay wall.

Client: Bahrain Investment Wharf, BSC
Quantity: 5,900,000 cubic meters
Dredge Types: Trailing Suction Hopper Dredge & Cutter Suction Dredge
Dredges: California, Carolina, Victoria Island, Manhattan Island, Sugar Island, Northerly Island & Booster No. 6

This project called for dredging and reclamation of 5.9 million cubic meters of material. A variety of dredges performed the work, including the cutter suction work by the dredge California and direct pump dredging by the hopper dredge Northerly Island. The dump and rehandle placement was handled by the dredges Manhattan and Sugar Island.

Client: Cruise Terminal, S.A. De C.V., A Wholly Owned Subsidiary of Carnival Corporation of Miami, FL
Quantity: 370,000 cubic meters
Dredge Type: Clamshell Dredge
Dredge: No. 53

The contract required the dredging of approximately 370,000 cubic meters of sandy material to a depth of -10 meters. This new-work dredging project was part of Carnival’s development of a two-berth terminal for cruise ships, which has allowed them to make over 200 cruise ship calls annually.
GALALI, MUHARRAQ, BAHRAIN

Client: The Kingdom of Bahrain  
Quantity: 31,000,000 cubic yards  
Dredge Types: Trailing Suction Hopper Dredge & Cutter Suction Dredge  
Dredges: Carolina & Victoria Island  

This project entailed dredging 31,000,000 cubic yards of material to be used for building land for the new port, the placement of 4,000,000 tons of rock protection and breakwater structures, and construction of a 1.1 mile-long quaywall. Great Lakes used the cutter suction dredge Carolina and the trailing suction hopper dredge Victoria Island to complete the works.

KHALIFA BIN SALMAN PORT & INDUSTRIAL AREA, HIDD, BAHRAIN

Client: The Kingdom of Bahrain  
Quantity: 31,000,000 cubic yards  
Dredge Types: Trailing Suction Hopper Dredge & Cutter Suction Dredge  
Dredges: Carolina & Victoria Island  

This project entailed dredging 31,000,000 cubic yards of material to be used for building land for the new port, the placement of 4,000,000 tons of rock protection and breakwater structures, and construction of a 1.1 mile-long quaywall. Great Lakes used the cutter suction dredge Carolina and the trailing suction hopper dredge Victoria Island to complete the works.

SEWAGE TREATMENT PLAN PROTECTION

Client: Ministry Of Works, Kingdom of Bahrain  
Quantity: 2,000,000 cubic meters  
Dredge Type: Cutter Suction Dredge  
Dredges: California & Utah  

The construction of a reclaimed platform for the purpose of establishing a sewage treatment plant, at Hidd Port, Bahrain. Scope of Work:

- Provide temporary access roadway along the reclamation footprint.
- Provide suitable design for the reclamation and protection works.
- Provide reclaimed platform to an elevation of +4.5 meters CD.

Reclamation fill material was obtained from the adjacent borrow sites (K1/K2). The reclamation consisted of 2 million cubic meters and adequate shore protection based on the Hidd wave climate. Great Lakes performed all of the dredging works and the civil works were performed by NASS Contracting Company Co., WLL.
**KETA SEA DEFENSE PROJECT, KETA, GHANA**

**Client:** The Ministry of Works and Housing, Republic of Ghana  
**Dredge Type:** Cutter Suction Dredge

This project was performed to create a much-widened stretch of reclaimed land and to put in place a protective revetment and groyne system that would prevent future inundation of inhabited areas by storm waters from the Gulf of Guinea in one direction or by flood waters in the Keta Lagoon from the other. Great Lakes restored the beaches between the groynes along a 9-kilometer stretch. The works also entailed the construction of a 9-kilometer road, the purchase and operation of a nearby rock quarry, and the creation and maintenance of some 50 kilometers of suitable roadways for transport of the rock via the company’s fleet of eight 100-ton ore trucks. Great Lakes performed this work using two demountable cutter suction dredges, and finished four months ahead of schedule.

**NEW PORT OF AL SUKHNA, SUEZ CANAL, EGYPT**

**Client:** Red Sea Port Authority  
**Quantity:** 26,000,000 cubic meters  
**Dredge Types:** Trailing Suction Hopper & Cutter Suction Dredge

This project involved the excavation of approximately 26,000,000 cubic meters of material to create the new Port of Al Sukhna. The existing coastline consisted of a gently shelving beach that required an access channel some 2.2 miles long in order to reach the required depth of 18 meters. The dredged material was disposed of at the designated onshore and offshore disposal areas, approximately eight kilometers from the turning basin. The overburden was removed by dry excavation and then a cutter dredge removed the remainder of the material. A second cutter dredge removed the underlying gravel to the offshore disposal area using a spider barge and scows. Once a depth of 10 meters had been achieved by cutter suction dredges, a hopper dredge completed dredging the access channel and turning circle to the final depth of 18 meters.

**ENTRANCE BAR CHANNEL & INTERIOR CHANNELS, SAN JUAN**

**Client:** USACE - Jacksonville District  
**Dredge Types:** Trailing Suction Hopper Dredge & Cutter Suction Dredge

This project involved deepening the entrance bar channel and interior channels of San Juan Harbor, with offshore disposal of materials, including:

- Drilling, blasting and dredging of 600,000 cubic yards of rock and sand on the Bar Channel in exposed sea conditions with rock strengths ranging from 10.3 to 165.5 megapascals.
- Stripping of 2,400,000 cubic yards of soft clay by hopper and clamshell dredges in the Anegado Channel, Army Terminal Channel, and Army Terminal Basin.
- Dredging to grade of 500,000 cubic yards of stiff clay by backhoe dredge in the Army Terminal Channel and Basin.
- Debris and archeological site removals.
Client: The Øresund Consortium

Quantity: 10,500,000 cubic yards (8,000,000 cubic meters)

Dredge Types: Dipper Dredge & Clamshell Dredge

The road/rail Øresund Fixed Link joins Sweden and Denmark via a 4-kilometer tunnel, a 4-kilometer artificial island (Peberholm), and an 8-kilometer cable-stayed bridge. The dredging and reclamation contract involved design, dredging and construction of the tunnel trench, work harbors, navigation and construction channels, compensation areas, and an artificial peninsula and island. The project entailed:

- Dredging: 10.5 million cubic yards (8,000,000 cubic meters)
- Stone Works: 2.2 million tons (2 million metric tons)
- Fill, Island: 11.1 million cubic yards (8.5 million cubic meters)
- Fill, Peninsula: 3.9 million cubic yards (3 million cubic meters)
- 544-acre (220-hectare) dike-lined landfill
- Construction of 39,400 feet (12 kilometers) of perimeter rock revetments for the reclamation area

Client: Hutchinson Port Holdings, the owner/operator of Freeport Harbor Company

Quantities:
- Spit Dredging – 1.12 million cubic yards
- Basin Dredging – 400,000 cubic yards
- Added Work – 190,000 cubic yards
- New Drydock Hole for Shipyard – 33,000 cubic yards

Dredge Type: Cutter Suction Dredge

Dredge: Texas

This expansion project entailed deepening and reclamation at Freeport Harbor. The project operations were performed to deepen portions of the harbor and to remove a spit that was in the direct path of FHC's port expansion plans. It entailed dredging approximately 1.5 million cubic yards of rock and disposing the material at an upland site designed and constructed by Great Lakes.
**Client:** The Ministry of Municipal Affairs & Agriculture  
**Quantity:** 10 million cubic meters  
**Dredge Types:** Trailing Suction Hopper Dredge & Cutter Suction Dredge  
**Dredges:** Victoria Island & Shark

This project involved the deepening and widening of the entrance channel to the Port of Doha, the construction of a container terminal site, and bund construction for the development of a new international airport.

- Channel Excavation: 16 kilometers in length, 175 meters wide, 11 meters deep  
- Material placement: Caprock, bedrock limestone, gravel, sand and silt material, 10 million cubic meters; 4 million cubic meters reclamation  
- Rock Armor Placement: 1 million tons

**Client:** Bandeirantes Dragagem E Construcao LTDA  
**Quantity:** 1,650,000 cubic meters  
**Dredge Type:** Trailing Suction Hopper Dredge  
**Dredge:** Reem Island

Great Lakes was hired to perform the majority of new work dredging for this deepening project in Natal, Brazil. The project entailed deepening the entire 5,200-meter length of the channel and turning basin from -10.0 meters to -12.5 meters. Great Lakes dredged approximately 1.65 million cubic meters of the 1.9 million cubic meter project. Bandeirantes completed the remaining 350,000 cubic meters of slope, berth and rock dredging. The work was performed by the hopper dredge Reem Island.

**Client:** Enron Corporation of Houston, Texas  
**Quantity:** 1,500,000 cubic meters  
**Dredge Type:** Trailing Suction Hopper Dredge

This project was for the development of an LNG berthing facility for a new power plant on India’s west coast, involving creation of a new channel and an adjacent turning basin. Excavating soft sediments, Great Lakes used a hopper dredge to remove 1.2 million cubic meters of clay from the channel and turning basin, digging to a depth of 14 meters, and transported the dredged material to an offshore disposal area. A hydraulic chisel was used for fragmentation of 300,000 cubic meters of hard granite over an area of 450,000 square meters. This material was excavated by bucket-ladder dredge, loading material into barges for deposition at sea. Additionally, the project required excavation for a foundation in advance of new breakwater construction.