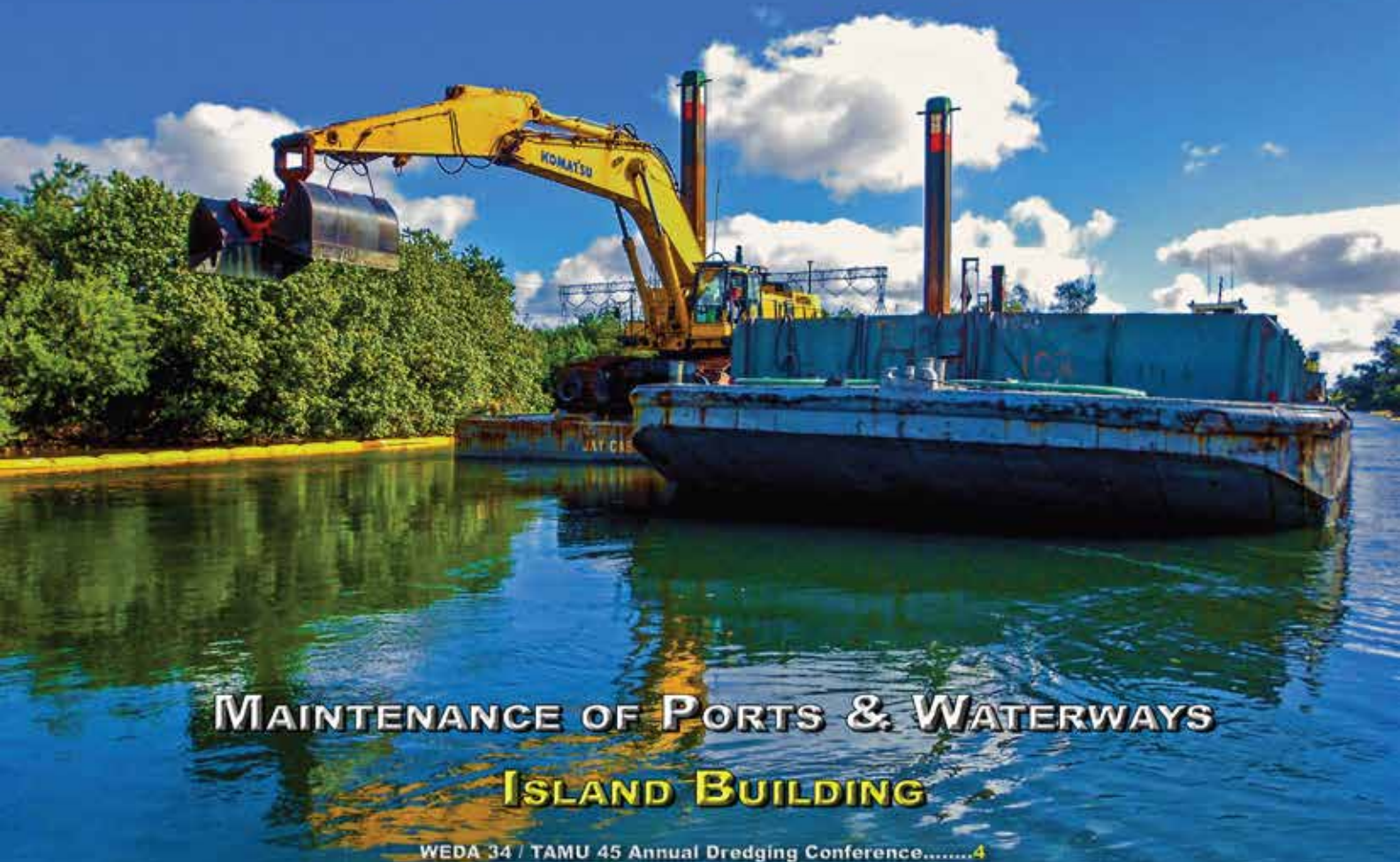
World DREDGING

Mining & Construction

Dania Cutoff Canal Deepening Project - Broward County, Florida - The contractor loaded dredged material from the bottom of the DCC, via an environmental clamshell into barges for transport via push boats to the DMMA. (See story on pg. 6)

Vol. 48, Nos. 9/10 - 02/14



Maintenance of Ports & Waterways

Island Building

Serving Ports, Waterways, Mining & Marine Construction Industries since 1965

Pipe & Tube Supplies, Inc.

Bringing the pipe world market to your front door

Supplying Limited Service, Surplus, and Used Pipe

Prices Lower Than New Prime Pipe

Cutting & Beveling, Sandblasting, Welding, Wheelabrating

Over 30Acres in the Houston area of 3" to 72" OD Carbon Steel Pipe

Shipping by Truck, Barge or Rail

We also purchase used and surplus pipe

1917 Mykawa Rd. • Pearland, Texas 77581 • 800-883-7473

www.ptsi-us.com • contact@ptsi-us.com

Unreserved public auction

Chehalis, WA

December 19 (Thursday) | 8 am

SPECIAL LIMITED-TIME FINANCING OFFER

NO PAYMENTS FOR 90 DAYS*

2009 DRAGFLOW DRX 745 HY 12 IN. w/DREDGE BOOSTER PUMP

Location

214 Ritchie Lane
Chehalis, WA 98532

Featured items

Dredges
Tug boat
Construction equipment
Trucks
Trailers
and much more...

Bid with confidence

- No minimum bids or reserve prices
- Up to 100% financing available
- Inspect and bid in person or online

Sell your equipment

Call today–any number of items accepted.

More items added daily

Visit **rbauction.com** to see all auctions and up-to-date listings.

rbauction.com | 360.767.3000

RITCHIE BROS. Auctioneers®

World DREDGING
Mining & Construction

Volume 48, Nos. 9/10 - 02/14 / US ISSN 1045-0343

Features

Departments

Head Office
PO Box 17479, Irvine, CA 92623-7479, USA; T: (949) 553-0836,
F: (949) 863-9261, E: worlddredging@aol.com, www.worlddredging.com

Editor / Publisher
Steve Richardson
E: wdmcsteve@aol.com

International Correspondent
Kurt A. Richardson

Foreign Technical Editor
Dieter Giersch - E: GierschConsult@gmx.de
Gluckstadt, Germany

Contributing Editor
Baer Charlton - baer@charltonproductions.com
Portland, Oregon, USA

European Office
D. Mark Carter, Manager
South Place, Derby Road,
Haslemere, Surrey GU27 1BP, England / U.K.
T/F: +44 (1428) 64-2208, E: mcworlddredging@outlook.com

WORLD DREDGING Mining & Construction (US ISSN 1045-0343) is published monthly by Placer Management Corp., 17951-C Sky Park Circle, Irvine, CA 92614-4359 USA. **ARTICLES:** Send to editor. **SUBSCRIPTION PRICES:** $100 - 1 year; $180 - 2 years; $280 - 3 years; Airmail Outside-USA per year - $200. **SINGLE COPIES:** Previous 12 issues - $10/copy, Directory - $20; Prior issues - contact us for price and availability. **ADVERTISING INSTRUCTIONS:** Send insertion orders and ad copy to Sales. **CHANGE OF ADDRESS:** Send new address with old address to Circulation, WORLD DREDGING, PO Box 17479, Irvine, CA 92623-7479, USA.

COVER: Dania Cutoff Canal Deepening Project - Broward County, Florida. The contractor loaded dredged material from the bottom of the DCC, via an environmental clamshell into barges for transport via push boats to the DMMA. *(See story on pg. 6)*

Florida Inland Navigation District

Dania Cutoff Canal Deepening Project - Broward County, Florida

Lori Brownell, P.E.[1], David Roach[2], Bruce Wood[3], Robert J. Wagner, P.E.[4], John Adams, P.E.[5]

Introduction. The Florida Inland Navigation District (FIND) — local sponsor for the 404-mile federally authorized Florida Atlantic Intracoastal Waterway (ICWW) and the eastern 98 miles of the Okeechobee Waterway (OWW) — recently deepened the Dania Cutoff Canal (DCC) in Broward County, Florida (Figure 1). The FIND formulated the project to provide mega-yachts and commercial vessels safer and deeper access to the boatyards and shipping facilities on the canal. Partnerships between project stakeholders and environmental regulatory agencies — including the FIND administration and Board of Commissioners, Port Everglades, Broward County, state and federal permitting agencies, local boating and commercial industry groups, as well as the FIND Engineer (Taylor Engineering, Inc.) and the dredging contractor (Lucas Marine Acquisition Company, LLC) — ultimately led to a successful project outcome.

Figure 1

This challenging project, constructed between July 2012 and April 2013, involved removal of approximately 91,000 yd^3 of weathered limestone, via an environmental clamshell bucket, along a ±4,700-ft section of the canal that extends from the southwestern end of Port Everglades. Temporary material placement and dewatering occurred in a 6-acre dredged material management area (DMMA) on the Port Everglades property located at the eastern project end. Final disposal of material occurred within local commercial-zoned construction projects.

Permitting/Design. Permitting for the project began in 2005 and the FIND received environmental permits from county, state, and federal regulatory agencies between 2010 and 2011. Major permitting challenges, which resulted in a nearly six-year permitting time-frame, stemmed from (1) adjusting for significant navigational restrictions due to natural channels and existing infrastructure; (2) securing a temporary placement area for dewatering; (3) handling sediments with elevated contaminants (arsenic) above the residential threshold criteria; and (4) avoiding submerged aquatic vegetation impacts, specifically *Halophila johnsonii* (Johnson's seagrass), and mitigating for impacted hard-bottom. Technical resolution and ultimate permit securement focused on clearly addressing regulatory agency concerns, garnering public support from the local marina industry, and developing a channel engineering design that minimized initial and maintenance dredging, environmental impacts, and required mitigation. The conceptual alternatives analysis for channel design considered : channel footprint and dredge volume - benefit of the proposed design to local marine industries and recreational boaters - dredge spoil disposal alternatives - dredge equipment and dewatering practices - seagrass and hard coral impacts — direct and indirect - other impacts to small-tooth saw-fish, manatees, and state and county parks

Ultimately — with pre-construction depths ranging between -14 ft Mean Low Water (MLW) to -8 ft MLW — the negotiated permitted design template allowed for channel deepening to -15 ft MLW with 2 ft of allowable over-dredge. Other permit requirements included : environmental clamshell bucket - self-contained barge with containment rails to hold the dredged material and prevent any return water from entering the surface waters - setback of 25 ft from all structures and 10 ft from all mangroves and root systems - No impacts to identified submerged natural resources (i.e., seagrasses) - 150-meter mixing zone down-current of the dredge location - Turbidity levels at or below 29 NTU above ambient background levels within

1. Waterfront Engineering Director, Taylor Engineering, 10151 Deerwood Park Blvd., Bldg. 300, Ste. 300, Jacksonville, FL 32256, Phone: 904-731-7040, E-Mail: lbrownell@taylorengineering.com
2. Executive Director, Florida Inland Navigation District, 1314 Marcinski Road, Jupiter, FL 33477, Phone: 561-627-3386, E-Mail: droach@aicw.org
3. Project Manager, Lucas Marine Acquisition Company, LLC, 3130 SE Slater Street, Stuart, FL 34997, Phone: 772-286-5094, E-Mail: BWood@lmcllc.net
4. Senior Engineer, Taylor Engineering, 10151 Deerwood Park Blvd., Bldg. 300, Ste. 300, Jacksonville, FL 32256, Phone: 904-731-7040, E-Mail: Jwagner@taylorengineering.com
5. Senior Advisor, Taylor Engineering, 10151 Deerwood Park Blvd., Bldg. 300, Ste. 300, Jacksonville, FL 32256, Phone: 904-731-7040, E-Mail: jadams@taylorengineering.com

the DCC.

Construction. The FIND completed the construction phase of the DCC project between July 2012 and April 2013. Along with a difficult permitting process, the construction phase also encountered its own set of challenges. A brief description of the construction process, challenges, and resulting course of action follow.

The contractor loaded dredged material from the bottom of the DCC, via an environmental clamshell (Figure 2), into barges for transport via push boats to the DMMA. The contractor tied the loaded material barges to fender dolphins and used a long-reach excavator and hydraulic clamshell bucket to unload the barges from land. Due to the elevated arsenic and subsequent permit requirement of zero-water discharge

Figure 2

directly into the DCC, the contractor used a pump to remove and transfer any freestanding water from the barge directly into the DMMA. With the excess water removed, the excavator swung approximately 180º and dumped the material directly into the DMMA.

To prevent spillage of material onto the mangroves, the contractor installed a steel spill plate (directly over the mangroves) to collect and appropriately transfer the spilled material to an upland area. As the material began to build up at the discharge point, the selected contractor used a front-end loader to move the material within the DMMA for initial dewatering. Once the material was mostly dewatered, the contractor transferred the material into the "stockpile area" to the north of the DMMA, for final draining and loading into sealed dump trucks.

Water that collected in the material-settling pond was gravity fed to two corrugated metal pipe flashboard weir risers connected to two 30-in corrugated metal pipes that discharged into the decanter area. As depicted in the DMMA (Figures 3 and 4), the DMMA design allowed suspended sediments to settle out of the water column by slowing the flow rate through the decanter via interior baffle berms. Water traveled from the decanter area through an elevated drain consisting of a single 30-in corrugated metal pipe and across two trip dams for final discharge into the DCC via an elevated drain/riser structure and a single 30-in corrugated metal pipe.

This process gave sediments time to settle and thus avoided excessive turbidity issues from the DMMA. Before allowing initial discharge of water from the DMMA, the permits re-

from pg. 7

quired that the contractor collect and test water samples (for identified contaminants) adjacent to the DMMA and background DCC samples. The contractor also collected and tested turbidity samples for compliance. Once the contractor had obtained passing test results, discharge began.

Primary construction-related challenges — marine traffic control, in-channel sediment removal, and turbidity — required detailed coordination with all stakeholders and the dredging contractor to resolve an appropriate solution.

Marine Traffic Control. The project area includes numerous marine-based commercial industries that require continued access to the DCC. With its ±80-ft wide equipment (dredge and adjacent material barge), the contractor expected to block channel access at 3 – 4-hour increments while material dredging and loading took place. Once a loaded material barge transferred to the DMMA, mariners would then have a 15 – 20-minute window to pass the dredge before the next barge was in place. Prior to project commencement, the FIND conducted an outreach meeting with the local commercial industry, U.S. Coast Guard (USCG), Port Everglades, and the dredging contractor.

The dredging contractor was able to explain the project logistics, including the operation schedule and dredging and offloading operations. The USCG recommended that the contractor either dedicate a single contact person or provide a call-in number where mariners could coordinate in-water activity between commercial vessels, dredge operations, and the marinas.

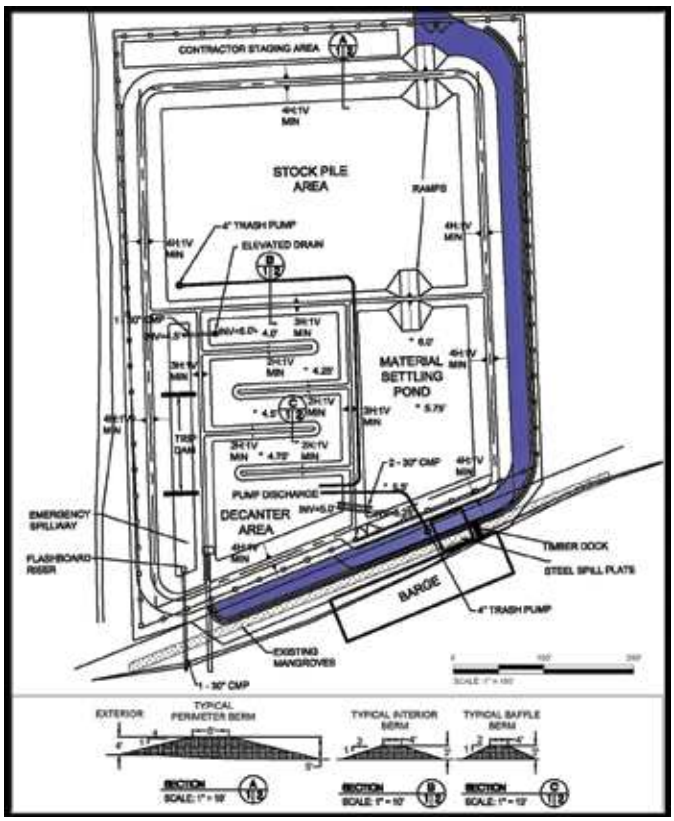


Figure 3

With exception of one commercial entity, all other groups were able to provide an advanced notice of 12 – 24 hours before vessel arrival. Unfortunately, the remaining entity required the dredging contractor to disengage dredging activities with little to no notice throughout that section of the project area.

Figure 4

In-Channel Sediment Removal. The FIND divided the ±4,700-ft project area into four 1,000-ft and one 700-ft long acceptance sections. The contractor did not report any sediment removal problems in three of the five acceptance sections; however, within two of the sections the contractor encountered harder material that could not be removed with approved equipment. The FIND contracted a local geotechnical engineering firm (Dunkelberger Engineering & Testing, Inc.) to collect Standard Penetration Test (SPT) borings in the problematic areas. The geotechnical firm evaluated the borings, and similar to the pre-bid geotechnical report, disclosed that the material consisted of weakly to moderately well-cemented silt and sandy (weathered) limestone throughout the project extent.

The SPT N-values decreased with increasing depth, which indicated a somewhat harder cap to the limestone formation. Finally, the geotechnical engineer also performed an analysis on the contractor's on-site environmental bucket and deter-

mined that the bucket could not break through the harder surface cap. For this reason, the FIND coordinated with the regulatory agencies to allow the limited use of a conventional bucket for the successful completion of these areas.

Turbidity. Over the course of 169 days of in-water dredging activities, the contractor reported two turbidity violations in excess of the 29 NTU above background. The combination of dredging weathered limestone, working within a relatively narrow channel with tidal influences (Figure 5), and the use of conventional bucket resulted in the contractor having to decrease operation speed to ensure turbidity compliance.

Summary. On average, the dredging contractor yielded a production rate of approximately 540 CY/day over the course of the 169-day working or 254-day total dredging period. Non-working weekends and minor equipment issues mostly contributed to the 85 non-working days. With exception of an inadvertent mangrove trimming and two turbidity exceedences, the project resulted in no environmental impacts and was able to obtain project depth through most of the 4,700-ft project area. The FIND estimates that the DCC portion of the project alone will increase marine economic output by the addition of 24 – 38 new jobs and $3.6 – $9.2 million per year into the local economies. To date, one boatyard has purchased and installed the largest vessel lift in Florida, another had a record repair season, and a commercial shipper deepened its main bulkhead to acquire a new ship. The FIND strongly believes these economic benefits justify the construction cost of $7.2 million. ❍

Figure 5

District awards US$ 8M contract to dredge Corpus Christi Ship Channel

Recently the U.S. Army Corps of Engineers Galveston District awarded a contract in the amount of US$ 8,054,750 to Orion Marine Inc., to perform maintenance dredging within the Corpus Christi Ship Channel, specifically from the inner basin (lower bay) to Beacon 82 (upper bay) and the La Quinta Junction and channel, in Nueces County, Texas.

The contractor is required to remove approximately 2M yd^3 of shoaled material from the channel reaches to provide sufficient channel depth for the transit of deep-draft vessels. The dredge material will be placed in various open water and upland placement areas adjacent to the channel reaches.

"This maintenance dredging contract schedule was accelerated by approximately two months in order to remove critical shoaling within the upper bay reach of the ship channel and at the La Quinta Junction," said Operations Manager Paula Rankin Wise, USACE Galveston District. "The removal of the La Quinta Junction shoaling is currently restricting the Big Foot deepwater oil platform from transiting through the La Quinta Channel to its offshore location. The accelerated schedule will ensure the mobilization of the Big Foot platform is not delayed."

Map of the Gulf Intracoastal Waterway (Texas portion)

According to Wise, Aransas-Corpus Christi pilots' imposed vessel draft restrictions at the upper bay reach are impacting the Port of Corpus Christi and it customers, coupled with increased traffic and congestion caused by the Eagle Ford Shale production. Work is scheduled for completion May 2014.

MATAGORDA, Texas (July 17, 2013) - Barges travel along the East Colorado River Locks, part of the Gulf Intracoastal Waterway. Navigation systems across the country significantly contribute to the growth and economic prosperity of our nation. The Colorado River Locks alone enables the transit of more than 12,000 tows, over 30,000 recreational or commercial vessels and 20 million tons of product annually, providing an essential service that significantly impacts local communities, the state and our nation's economies. Visit http://www.swg.usace.army.mil/BusinessWithUs/OperationsDivision/

When you don't want the Full Monty

STICK TO BASE•X

Base•X is our newest data logger. It's everything you need and nothing you don't.

Base•X gives just the basics. You get the robust quality you expect from AML, but at an entry-level price.

There's more. Base•X uses AML's field-swappable Xchange™ sensors – conductivity, sound velocity, pressure, temperature, and turbidity. Each sensor contains its own embedded calibration, is easy to install, and quick to swap.

Together, Base•X and Xchange™ will save you hundreds of hours of downtime and thousands of dollars of expense.

AML OCEANOGRAPHIC
Xchange your old ideas

conductivity / sound velocity / pressure / temperature / turbidity

1-250-656-0771

www.AMLoceanographic.com

District awards $5 million contract to dredge GIWW

Also recently the U.S. Army Corps of Engineers Galveston District awarded a contract in the amount of $5,180,000 to RLB Contracting Inc., to perform maintenance dredging within the Gulf Intracoastal Waterway, specifically from Corpus Christi Bay to Port Isabel, Texas.

The contractor is required to remove approximately one million cubic yards of shoaled material from the channel reaches to provide sufficient channel depth for the transit of shallow-draft vessels. The dredge material will be placed in partially emergent placement areas along the Intracoastal.

"Throughout the year, sediments within the water column will settle and accumulate within the channel, a process known as shoaling," said Operations Manager Capt. Derek Thornton, USACE Galveston District. "We will remove the shoaled material to the authorized project depth to allow for safe navigation between dredging cycles."

"Staff keeps environmental considerations at the forefront when undertaking the design, construction and execution of projects that are crucial to keeping the nation's waterways safe

NUECES COUNTY, Texas (Jan. 24, 2013) – A U.S. Army Corps of Engineers Galveston District employee conducts a site visit within the La Quinta Channel Extension Project to oversee the construction of an underwater levee that is part of a beneficial use site that will provide a shallow water sea grass habitat along the south side of the new channel within the La Quinta Channel Extension Project in Nueces County, Texas. USACE Galveston awarded a contract in September 2011 in the amount of $33,537,027.20 to Texas-based King Fisher Marine Service LP (now known as Orion Marine Group) to complete the project. Established in 1880 and fondly known as the "Custodians of the Coast," the USACE Galveston District plays a key role in America's well-being by keeping waterways open for navigation and commerce and serves the nation as part of the world's largest public engineering, design and construction management agency.

NUECES COUNTY, Texas (Jan. 19, 2013)- U.S. Army Corps of Engineers Galveston District conducts maintenance dredging work at the La Quinta Channel Extension Project in Nueces County, Texas. Work includes deepening the channel extension and creating a beneficial use site with a scheduled completion of July 2013. USACE Galveston awarded a contract in September 2011 in the amount of $33,537,027.20 to Texas-based King Fisher Marine Service LP (now known as Orion Marine Group) to complete the project. Established in 1880 and fondly known as the "Custodians of the Coast," the USACE Galveston District plays a key role in America's well-being by keeping waterways open for navigation and commerce and serves the nation as part of the world's largest public engineering, design and construction management agency.

for navigation," said Thornton. "Maintaining a balance between development and minimizing the impact on our environment is in keeping with our commitment to remaining good stewards of our environment." Work is scheduled for completion April 2014.

The USACE Galveston District was established in 1880 as the first engineer district in Texas to oversee river and harbor improvements. The district is directly responsible for maintaining more than 1,000 miles of channel, including 250 miles of deep draft and 750 miles of shallow draft as well as the Colorado River Locks and Brazos River Floodgates.

Learn more about the Texas coast at http://www.swg.usace.army.mil/Missions/TexasCoastValuetotheNation.aspx. For news and information, visit www.swg.usace.army.mil. Find us on Facebook, www.facebook.com/GalvestonDistrict or follow us on Twitter, www.twitter.com/USACEgalveston.

Contact: Sandra Arnold, APR+M, Chief, Public Affairs, U.S. Army Corps of Engineers Galveston District; Office: (409) 766-3005, Blackberry: (409) 502-9150, Web: http://www.swg.usace.army.mil, Facebook: http://www.facebook.com/GalvestonDistrict, DVIDS: http://www.dvidshub.net/units/USACE-GD, Twitter: http://twitter.com/usacegalveston LinkedIn: http://www.linkedin.com/company/3517332. ❍

Island Building in the Atchafalaya River, Louisiana USA
An Engineering with Nature Demonstration Project

Burton C. Suedel[1], Thomas J. Fredette[2], and **Jeffery M. Corbino[3]**
[1] US Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, MS USA
[2] US Army Corps of Engineers, Engineer Research and Development Center, Concord, MA USA
[3] US Army Corps of Engineers, New Orleans District, New Orleans, LA USA

Introduction

Over the past several years, the US Army Corps of Engineers (USACE) New Orleans District has been using dredged material to nourish a small island that began forming naturally in the Atchafalaya River, Louisiana (LA). This effort has involved placing sediment dredged from a Federal navigation channel during routine maintenance in low relief mounds upriver of the island since 2002 (Figure 1). The mounded material has been dispersed by natural river currents to self-design the island. Prior to 2002, dredged material was being placed directly into shallow depressions along the river's banks to nourish existing wetlands, but continued placement into these areas was not sustainable because high quality wetlands would be converted into upland habitat.

Consequently, the alternative beneficial use to place material upstream of the small natural island was conceived. Until recently, only visual inspections have been conducted of the developing biological community on the island, thus benefits the island was creating remained largely unknown. As part of the Engineering With Nature initiative within the USACE, we have recently begun an investigation to use the island as a demonstration project to quantify the biological benefits and otherwise improve our understanding of the physical maturation of this beneficial use of dredged material within the Atchafalaya Basin.

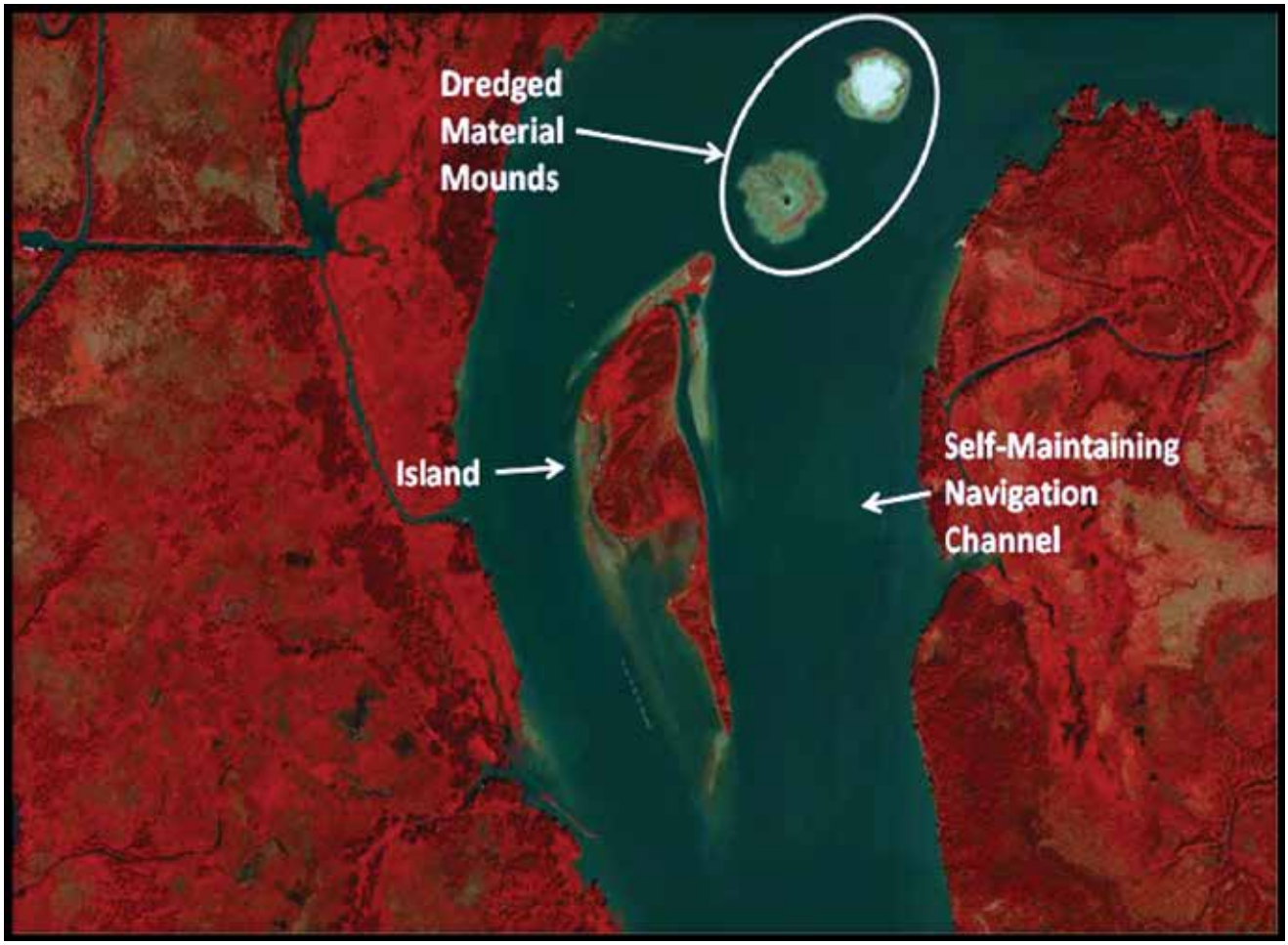


Figure 1: December 2011 aerial infrared photograph of the Atchafalaya River island after multiple years of upstream mounding of dredged material. The island's formation has reduced the overall cross sectional area of the river, increasing river flow through the navigation channel to the east sufficient to reduce shoaling and maintenance dredging requirements.

The USACE Engineering With Nature Initiative

Engineering With Nature (EWN) is a USACE initiative that seeks to support more sustainable practices, projects, and outcomes. As an approach to developing, engineering and operating projects, EWN intentionally aligns natural and engineering processes to efficiently and sustainably deliver economic, environmental and social benefits through collaborative processes.

The elements of the EWN approach are to:

Use science and engineering to produce operational efficiencies supporting sustainable delivery of project benefits;

Use natural processes to maximum benefit, thereby reducing demands on limited resources, minimizing the environmental footprint of projects, and enhancing the quality of project benefits;

Broaden and extend the base of benefits provided by projects to include substantiated economic, social, and environmental benefits; and,

Apply science-based collaborative processes to organize and focus interests, stakeholders, and partners to reduce social friction, resistance, and project delays while producing more broadly acceptable projects.

The Atchafalaya River island project is a positive example of what can be achieved through the application of EWN concepts and practices. Current EWN activities include documenting current USACE projects exemplifying the approach and communicating across the technical community and with USACE partners and stakeholders.

A River Island is Formed

To help understand how and why the island was formed over the last 10 years, the USACE is conducting a series of studies to better understand the hydrology of the river used to transfer the mounded material onto the island. In addition, multiple moderate and high resolution aerial photographs are available from prior to 2002 to the present that clearly document the growth of the island.

These will be examined in greater detail to catalog the island's formation and maturation for determining the effectiveness of this individual project in terms of restoring, creating, enhancing, and protecting the coastal Louisiana landscape.

Island Benefits

Previous studies of the island only provided qualitative documentation of the fauna and flora of the island. Our recently initiated study will conduct quantitative surveys of the plant communities that have developed on the island. Observations from the first of these survey visits in 2013 indicated a healthy island habitat (Figure 2).

The island currently encompasses 100 acres (40 ha) consisting of forested,

from pg. 15

scrub-shrub, emergent, and aquatic bed habitats supporting development of a variety of plant and animal species. The island supports multiple species, with over 80 plant and 20 animal species observed to date. Preliminary work on the island therefore suggests that the area has been colonized by a diverse assemblage of faunal and floral species. Signs of human activity were also noted on the island, as the presence of shotgun shells signified that the island was being used for hunting. Economic benefits are being realized as the enlarging island has reduced the overall cross sectional area of the river, increasing the river's flow through the navigation channel to velocities that were sufficient to reduce shoaling and maintenance dredging requirements. Intentionally aligning natural processes in the river with engineering processes via strategically mounding dredged material is realizing tangible environmental, social, and economic benefits.

Figure 2: A diverse assemblage of native plant life has colonized the island. In this photo is an extensive stand of the native American lotus (Nelumbo lutea) growing on the island.

What the Future Holds

Going forward, research is focusing on further quantifying the many benefits being provided by the island within the Atchafalaya Basin. Efforts will focus on comparative investigations of a reference island in the basin, surveys of bird and mammal usage, determinations of biogeochemical functions and benefits, species management for habitat improvement, and the hydrodynamic characteristics of the river in the area. These investigations further quantifying the multiple benefits of using dredged material to create such riverine islands will provide a more complete understanding of the formation of the island so this concept can be integrated into other dredging projects in southern Louisiana and elsewhere, thereby providing substantial environmental, social, and economic benefits as part of ongoing USACE maintenance dredging activities.

Contact: Burton C. Suedel, Ph.D., Research Biologist
US Army Corps of Engineers
Engineer Research and Development Center, Environmental Laboratory
3909 Halls Ferry Road, Vicksburg, MS 39180
T:601-634-4578, F:601-634-6822
Burton.Suedel@usace.army.mil

Economic Recovery,
Coastal Protection and
Environmental Restoration

It all starts with Dredging®

Great Lakes Dredge & Dock Company, LLC

Established 1890 • EOE • 630.574.3000 • info@gldd.com • gldd.com

Committed to creating an incident- and injury-free **(IIF)** work environment

Damen dredge KARAMARA clears river in Nigeria

CSD500 Karamara on site eating away through the sand banks blocking the river

Damen delivered a new CSD500 recently to Nigeria which began clearing a 52 km long stretch of a river, to improve accessibility of an inland transshipment port.

The KARAMARA has been acquired to increase the accessibility of a fuel stock site. This site is located on a riverbank in Akwete, Nigeria, some 52 km from the open sea. Barges transport various types of fuel from the open waters to this bunker site where it is stored for resale. The current navigable depth of the river causes problems in the logistics as it is no more than 1.5 m. The full length of the supply line is to be deepened to 5 meters – an impressive job.

CSD500 Karamara near transhipment port in Akwete Nigeria as seen from ladder.

The Karamara is a standard Damen cutter suction dredge, type CSD500. It has been fitted out with a number of standard options, including anchor booms, a jib crane, navigation lights and BV class approval. The delivery included Damen survey instrumentation for monitoring the progress of the job. Moreover a set of spare parts as well as commissioning and training on site are included.

The CSD500 has been shipped partly dismantled to Nigeria to facilitate transport. After assembly in the port of arrival the cutter suction (CS) dredge has been towed to its current location, some 40 km east of Port

The Damen survey software ensures an efficient dredging process

Harcourt. The Damen Field Service Engineers arrived with the dredge to train the crew in maintenance duties and dredging; a Damen dredge master is present to explain and train the crew on the full dredging process to maximize dredging efficiency.

Damen states that the project began with a flying start that within days the full lay-out of the site including the floating pipe line was ready for action. The first dredging surveys were performed and the CSD500 began eating its way through the sand banks to enable a safe and swift journey of fuel barges.

Damen Dredging Equipment :
Damen Dredging Equipment is a specialised supplier of dredging equipment and dredging instrumentation & automation. The company, based in Nijkerk, the Netherlands, has over 70 years of experience in the construction of dredging equipment serving the worldwide dredging industry. The dredging tools made are all built to specific customer requirements, making use of a wide range of standard equipment. The company is fully owned by the Damen Shipyards Group.

Contact:
Damen Dredging Equipment, Ms Saskia den Herder, PR
Tel +31 33 247 40 40, E-mail SdH@damendredging.com
www.damendredging.com

33RD PIANC
WORLD CONGRESS
San Francisco 2014
June 1 to 5

Join leading professionals from around the world to explore advances in waterborne transport infrastructure.

Navigating the New Millennium

San Francisco Marriott Marquis

NAVIGATION • PORTS • WATERWAYS • ENVIRONMENT

The 33rd PIANC World Congress puts it all together for you in one place with impressive depth and breath of program content:

- 260 technical presentations with presenters from 30 nations covering a wide range of topics
- Two plenary sessions
- Six pre-Congress short courses
- Three technical tours

PLUS

- Networking opportunities including the Congress Banquet aboard the beautifully restored San Francisco Belle
- An Exhibit Hall with more than 60 vendors demonstrating the latest products and services
- Events for young professionals and students (40 years old and younger)
- Tours of San Francisco and Sausalito for accompanying persons

REGISTER TODAY

http://2014congress.pianc.us/index.php/registration

BOOK YOUR ROOM

https://resweb.passkey.com/go/pianc

PLENARY SESSION HIGHLIGHTS

- **Keynote Address** by Mr. Jorge L. Quijano, Administrator, Autoridad Del Canal De Panama (ACP)
- **Climate Change and Inland Waterways Transport:** When and How to Adapt—the US Experience, Dr. Craig Philip, CEO of Ingram Barge Co. and PIANC USA Commissioner

PRE-CONGRESS SHORT COURSES

- Marina Design
- Working with Nature in Navigating the New Millennium
- Lessons from Coastal Disasters
- Innovation in Lock and Gate Design
- Value of Inland Waterways
- Berthing Velocities and Fender Design

2014congress.pianc.us

CABLE ARM POSITIONING

CLAMVISION®

CLAMVISION® is an easy to maintain, versatile software suite. This wireless dredge positioning system is designed to run with the most common marine applications. From clamshells to cutter heads, excavators to drill barges, CLAMVISION® offers operators and crew a real-time view of the barge and machine's position overlying the job site. The software gives information on where to dig and how deep to go, eliminating all guesswork. It displays a 3-D, color-coded surface derived from existing hydrographic data and projected surface models. System information is automatically recorded and stored into a file viewable on any computer, no need for extra "hard lock" keys. Alonside each installation, CLAMVISION® technicians provide solid training and are available on site upon request.

Other services offered include seafloor imaging and hydrographic surveying.

Real time operator turbidity gauges: Correct turbidity spikes without job interruptions by providing the operator with the information needed to determine the cause.

Wireless hardware setup: Work free of wires between the machine and office.

Unmatched support: Cable Arm techs are available to help with your software and hardware needs.

NEW

Accurate Cable Counter: Accurately calculate bucket depth on clamshell rigs and give the operator the ability to dig with precision at any speed.

RTK Tide: GPS to factor tide rather than a land based gauge.

Elevation Mode: Change depth to elevation when a project also has machines on land. Elevation can be obtained by RTK GPS or a construction laser.

Excavator sensor: Move away from gravity based inclinometers where erroneous readings caused by shock and vibration can produce false dig/capping records in your positioning system. Our rugged sensors respond to the movement of the machine pivot points only. Thus producing smooth and accurate data for your positioning system. Available in stainless steel, aluminum, or plastic.

CALC
CABLE ARM LINE COUNTER
HIGH ACCURACY, HIGH PRODUCTION

info@cablearm.com - www.cablearm.com

Cable Arm

MAINTENANCE DREDGING

Great Lakes Dredging Dock - Dredge 54 using a 50 yard³ navigational bucket on the Baltimore Navigation Channel.

CABLE ARM, INC, leading design and innovator of environmental clamshells, is producing far more environmental models than ever before. While they do offer an impressive navigational model that inherits most of its environmental counterpart's features, more and more dredges are finding environmentally friendly upgrades offer a finer job completion... and greater satisfaction.

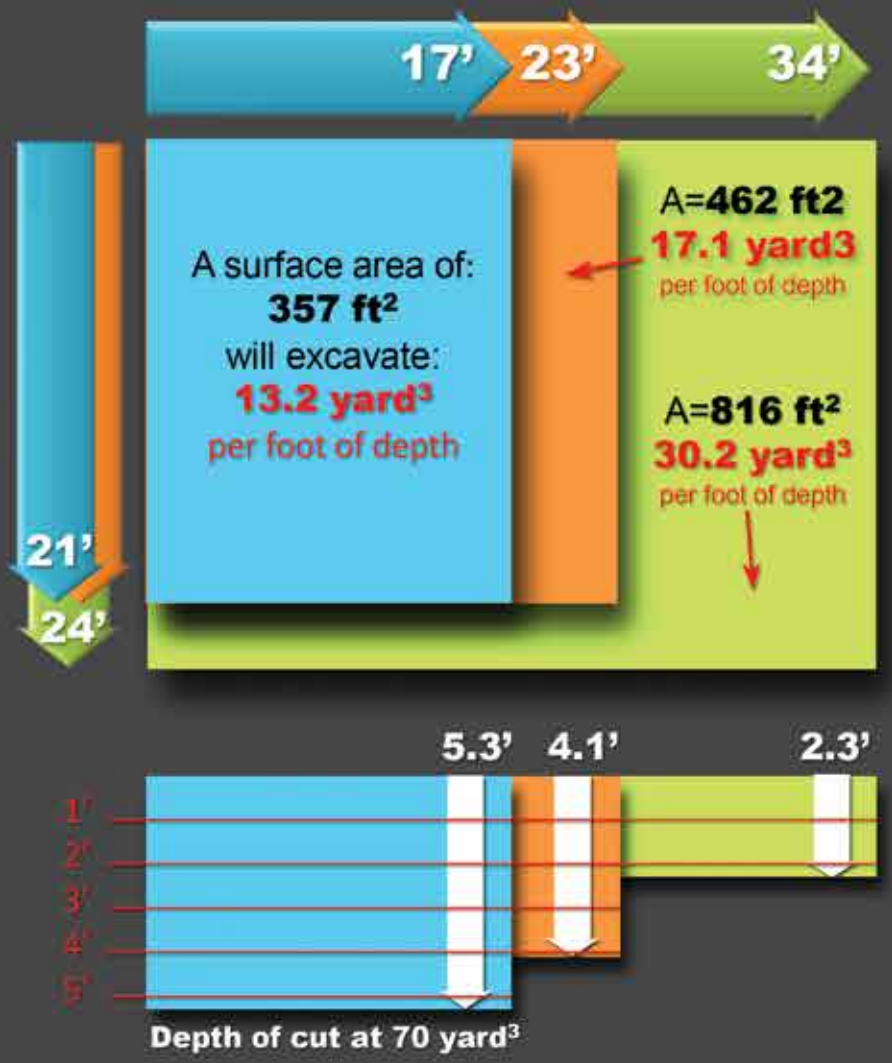
Weeks Marine maintenance dredging on the Hudson River, just north of the Tappan bridge.

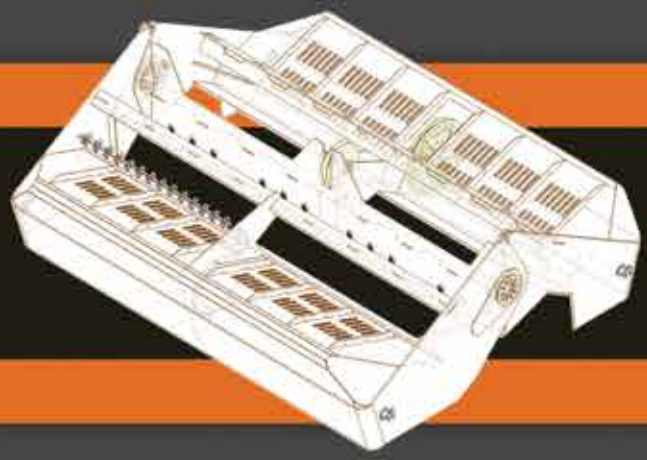
What is the reason dredgers are seeking environmental buckets for maintenance dredging? The environmental line focuses on one major aspect, windrowing. When windrowing, or sediment dispersal, takes place, more passes are required to complete the job. Environmental buckets offer a cleaner, more efficient maintenance job achievement.

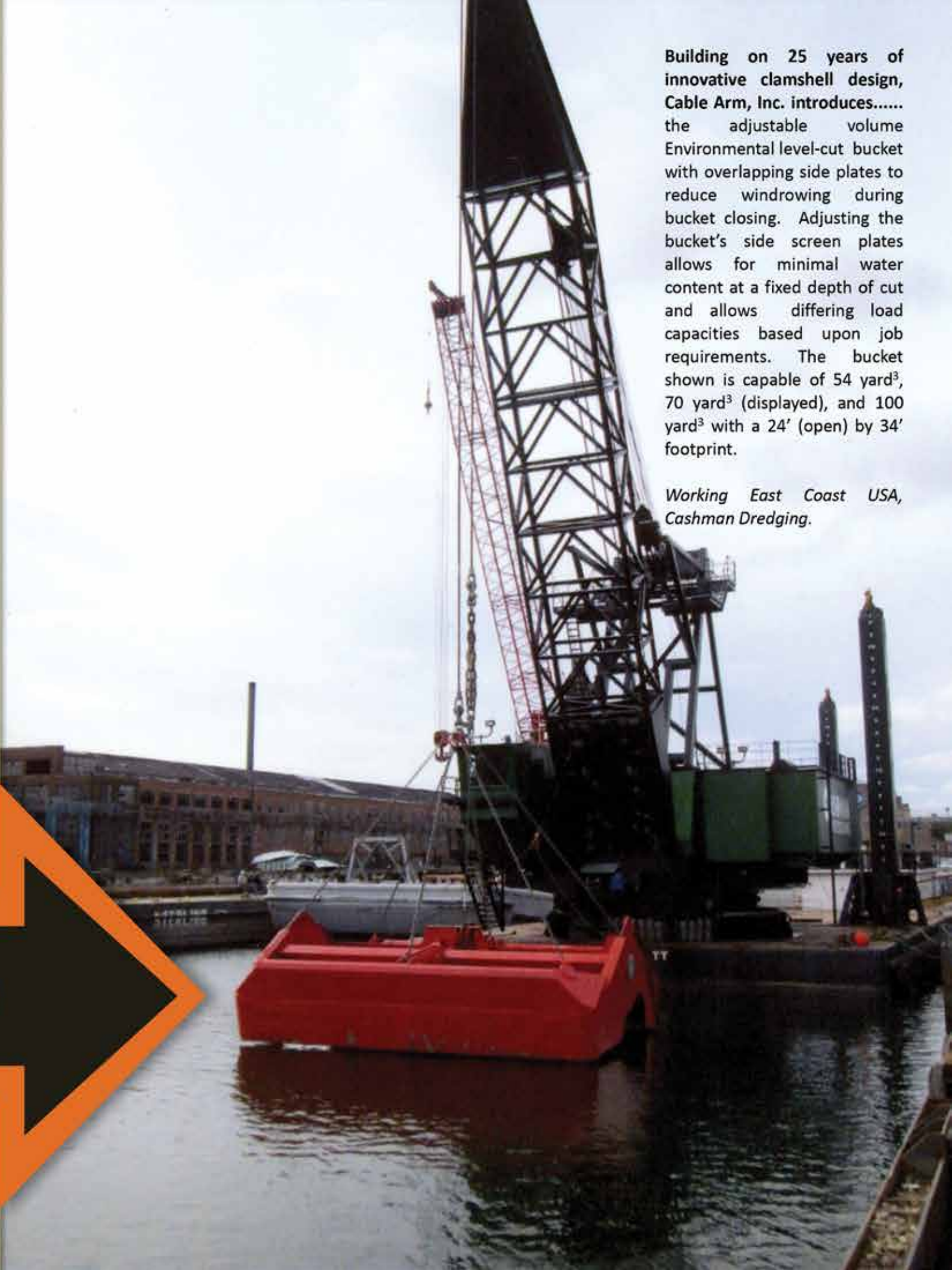
FOOTPRINT COMPARISON

How much material is removed per foot of depth is an important factor that can reduce operational costs during shallow face dredging.

Let footprint size reduce water content in shallow face dredging. When removing a smaller amount of solids over a given area, the remaining load capacity will be filled in with water. By enlarging dredge material surface area, solids will remain high with little room for water content.





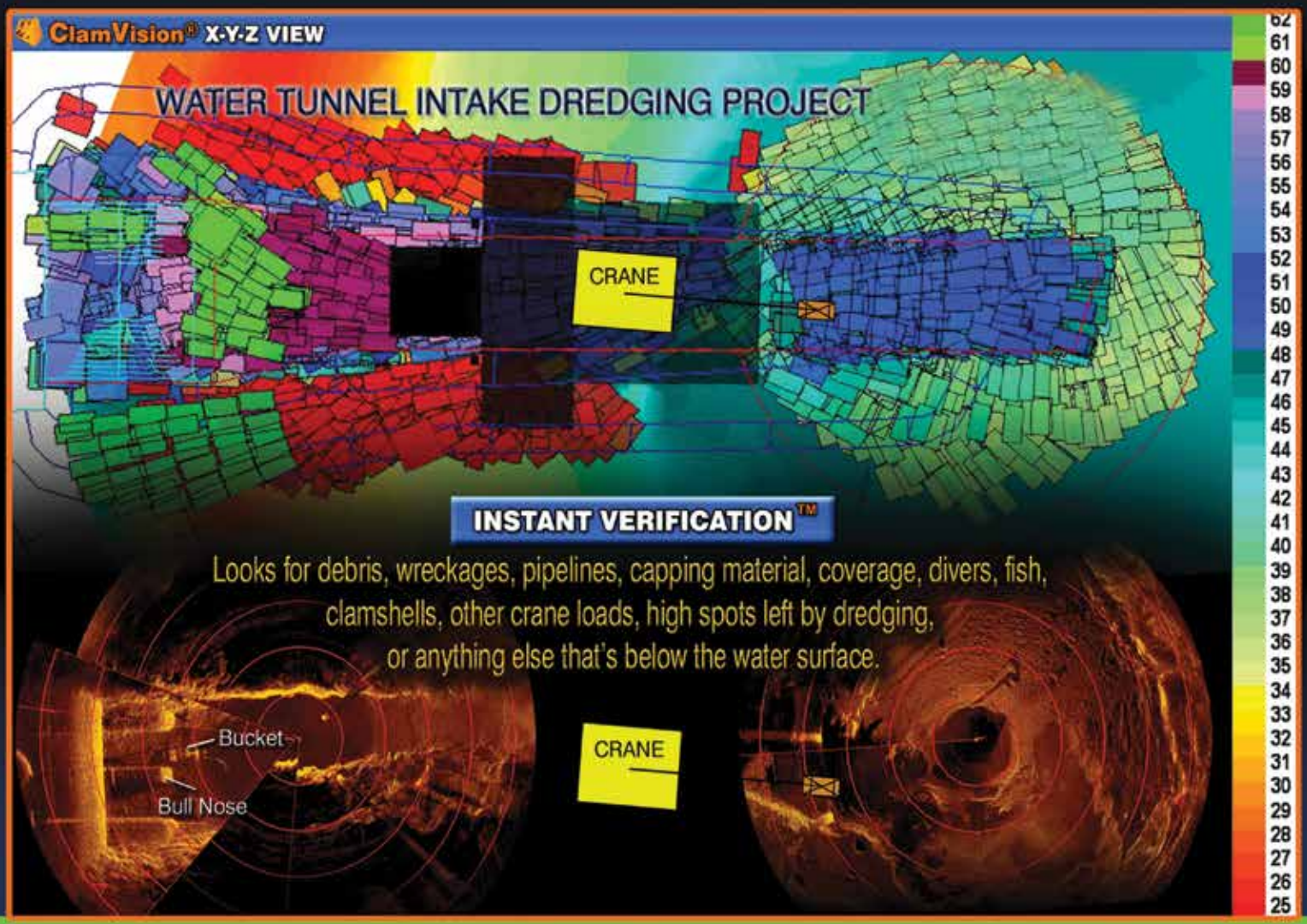


Building on 25 years of innovative clamshell design, Cable Arm, Inc. introduces..... the adjustable volume Environmental level-cut bucket with overlapping side plates to reduce windrowing during bucket closing. Adjusting the bucket's side screen plates allows for minimal water content at a fixed depth of cut and allows differing load capacities based upon job requirements. The bucket shown is capable of 54 yard^3, 70 yard^3 (displayed), and 100 yard^3 with a 24' (open) by 34' footprint.

Working East Coast USA, Cashman Dredging.

DESIGNED TO MINIMIZE
THE 4 "RS"
RESUSPENSION - RELEASE
RESIDUAL - RISK

ACOUSTIC IMAGING
INSTANT VERIFICATION™
of Bottom Conditions using **CLAMVISION®** software & a high resolution acoustic imaging system.



Authorized Dealer of

Hemisphere GPS

TRU-VU
CUSTOMIZABLE INDUSTRIAL MONITORS

ScowMon 5.0®

SQUEEZER®
unloading - dewatering
Clamshell

Multi - Axis
HYDRAULIC CLAMSHELL

CLAMVISION®

Cable Arm®

www.cablearm.com

info@cablearm.com

Remediation, restoration, revitalization of the Buffalo River

Laying the foundation for a BLUE ECONOMY as an urban waterway is reclaimed

Kevin A. Keenan

With the skill of a surgeon, crews are meticulously dredging the Buffalo River, ridding it of decades of contamination, setting the stage for the restoration of habitat for fish and wildlife, improved water quality and enhanced public access. Twenty-four hours a day, six days a week, between late June and December, operators dredge the river with a massive clamshell bucket that is repeatedly lowered into the water from a crane decked on a barge.

When the four year project is completed in 2015, the equivalent of 33,000 truckloads of sediment will have been removed from the riverbed. The shipping channel was formed nearly 100 years ago, in part, to alleviate upstream residential flooding.

Work halts from January 1 to June 15 each year, the fish spawning season on the river.

Dredging next to a General Mills grain elevator

Remediation, restoration, revitalization of the Buffalo River

from pg. 29

Known as the Buffalo River Restoration Partnership, this public-private collaboration includes U.S. Environmental Protection Agency (USEPA), U.S. Army Corps of Engineers (USACE), New York State Department of Environmental Conservation (DEC), Buffalo Niagara Riverkeeper and Honeywell.

USEPA is project manager for projects involving Great Lakes "Areas of Concern," (AOC) of which the Buffalo River is one. AOC's are required by the Great Lakes Water Quality Agreement to advance environmental cleanup through remediation strategies including dredging of contaminated sediment. The agency partnered with Honeywell and Buffalo Niagara Riverkeeper, and has been involved in the project design along with other partners, and is managing the construction.

The project addresses the historical industrial contamination, common in many of the Great Lakes, rivers and harbors according to Scott Cieniawski, project manager for USEPA. "We saw a huge improvement when the Clean Water Act came into effect. We've been able to greatly reduce the amount of contamination going into these systems," he said.

"The problem is, the sediments present a storehouse for the contamination of the past, where they continue to have impacts on fish tissue concentration, so there are restrictions on fish consumption, they continue to cause fish tumors and other deformities in other kinds of wildlife and really degrade the aquatic system and really reduce what your able to do with these rivers, which for the city of Buffalo is a huge draw, it's a huge benefit to the city to have a clean and healthy river."

Sevenson Environmental Services of Niagara Falls, New York (NY), is a team partner with EQM, an engineering and design firm out of Cincinnati, which was awarded the US$ 40M contract by the Great Lakes National Program office. Luedtke Engineering, a subcontractor of Sevenson, is doing the dredging and hydraulic unloading of the barges filled with sediment that is transported by barge for processing at the confined disposal facility (CDF).

"These are historical legacy sediments that have been there for a long time that don't normally get addressed through the routine navigational dredging," said Martin Doster, regional environmental remediation engineer for DEC. "These pockets of contaminated sediments have been identified over the last decade through a serious of sample investigations and engineering investigation."

Another view of the dredging, with the Buffalo Skyway in the background

Crews are mechanically dredging approximately 480,000 yd^3 of PCB sediment from the lower 6.5 miles of the Buffalo River and the City Ship Canal. The sediment is loaded into scows and placed in the USACE's CDF, located three miles south of the Buffalo River on the shores of Lake Erie. Another 5,000 yd^3 of PCB sediment will be processed, dewatered, stabilized and disposed of offsite in a Toxic Substances Control Act permitted landfill (waste with >50 parts per million PCB concentration).

Along with the sediment, the material being pulled from the river bed varies according to Ben Faery, Sevenson's project manager. "Logs are coming up and there are a lot of tires, cable, concrete, you name it."

The sediment and debris are loaded onto a barge which is then towed to the confinement facility, where a hydraulic unloader pumps it in through a pipeline into the actual CDF.

Jill Jedlicka, Buffalo Niagara Riverkeeper Executive Director

Sediment is offloaded using a 16-inch hydraulic dredge that has been modified specifically for offloading sediment scows into CDFs. Water is recirculated from within the CDF to create and slurry and the sediments are pumped thru a 16-inch pipeline to a designated area within the CDF.

Debris that ends up in the sediment scows is removed periodically at the temporary pier constructed by Sevenson at the CDF. Debris is offloaded using a long reach excavator with grabble attachment, loaded into off-road dump trucks and placed within the CDF footprint.

USEPA is project manager for projects involving Great Lakes "Areas of Concern," (AOC) of which the Buffalo River is one. AOC's are required by the Great Lakes Water Quality Agreement to advance environmental cleanup through remediation strategies including dredging of contaminated sediment.

The project also calls for insitu capping over an eight to 10 acre area of contaminated sediment along a 1.4 mile stretch of the City Ship Canal, located adjacent to the Buffalo River. Habitat restoration will also be completed.

USACE is supplying subject matter experts to work as part of the Buffalo River Restoration Partnership and to oversee the work that is being done. Bruce Sanders, Public Affairs Officer for the U.S. Army Corps of Engineers, Buffalo District, said, "The partnership's efforts will contribute significantly to the ecological restoration of the Buffalo River and the Great Lakes. We're optimistic that working together to leverage available resources the partnership will leave a legacy we can all be proud of."

According to Buffalo Niagara Riverkeeper, the restoration

from pg. 31

Debris being removed from the Buffalo River

Ben Faery of Sevenson, project manager on the Buffalo River Restoration project

Martin Doster, regional environmental remediation engineer for New York State Department of Environmental Conservation

from pg. 33

Scott Cieniawski, project manager USEPA

project has leveraged nearly $75 million in restoration of the Buffalo River and shoreline, which is laying the foundation for Western New York's "blue economy."

Jill Jedlicka, Riverkeeper Executive Director, is passionate about this project. Two generations of her family have doggedly worked to clean up the river. "It's exciting. For a long time, we never thought it would happen. To be able to get a point where we actually see the dredge plants and the scows and the 40 plus jobs that have been created for this project it makes you feel great that your work means something for not only your organization but for your entire community."

This is just the beginning. Jedlicka said the motivation behind a river restoration is to help simulate the local economy, something she calls a "blue economy, that's water dependent and is a recreational resource."

Economic revitalization around the river is beginning to take hold, with investors looking to capitalize on the cleaner, restored waterway. "It's seen as prime real estate and prime for private investment," Jedlicka said.

"I think it's another page in the book of turning Western New York around economically, but also bringing people back to the waterfront," the DEC's Doster said. "For a long time, I think Buffalo and the people here have never taken the time to come to the water to be part of that waterfront, and now we, as a society, are embracing that. We're excited about restoring environmental features of the river, which in turn, benefit everybody who lives here in Western New York."

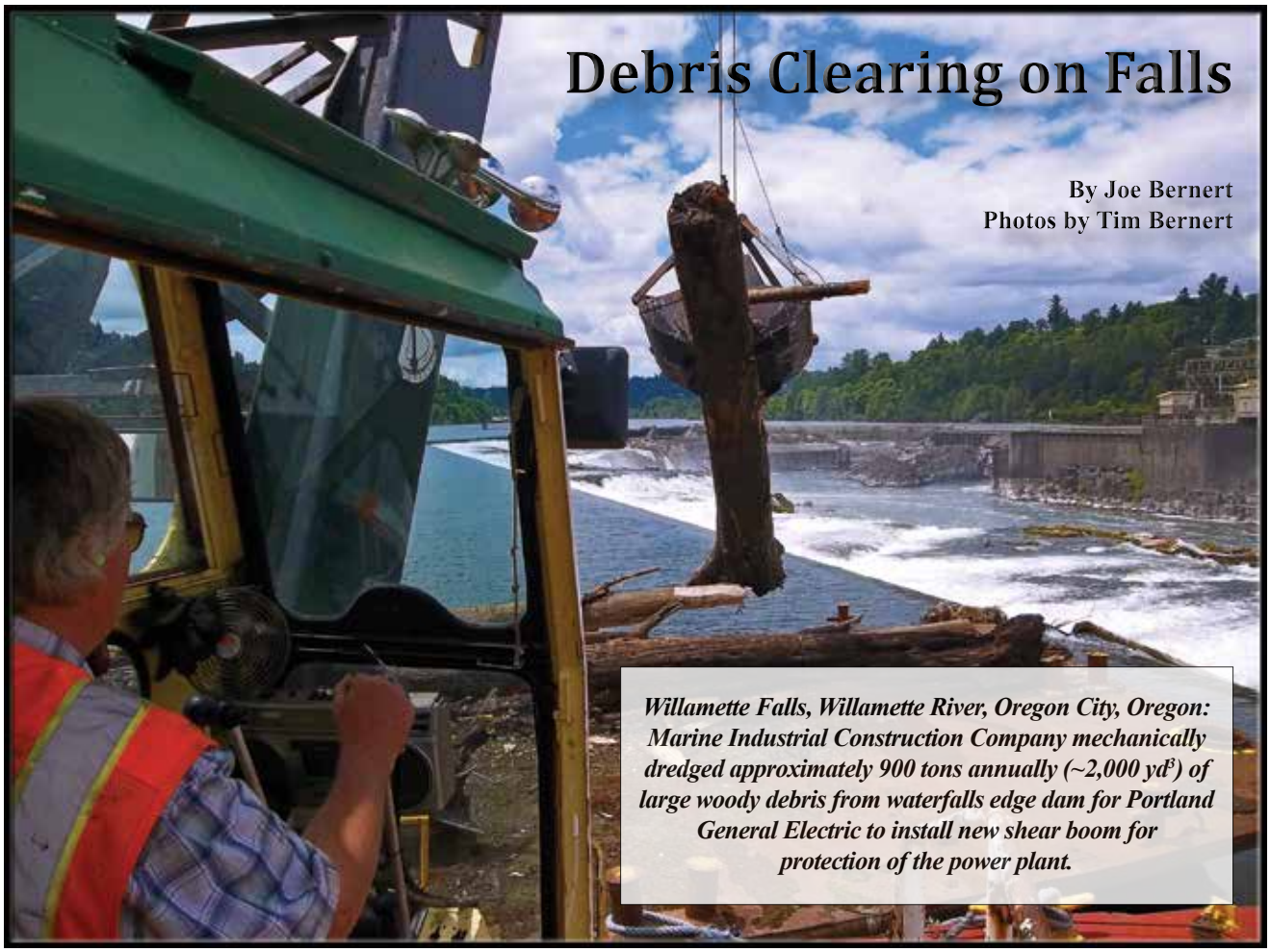
The future for the Buffalo River is bright. USEPA's Cieniawski noted that regulations that have come into effect have led to cleaner systems in general, and waterways no longer run the risk of recontamination.

Jedlicka concurs, "We've always said that water defined our history it will define our future. But now, clean and healthy water will define our future."

Kevin A. Keenan
Keenan Communications Group
716-481-6806 (mobile/text)

Debris Clearing on Falls

By Joe Bernert
Photos by Tim Bernert



Willamette Falls, Willamette River, Oregon City, Oregon: Marine Industrial Construction Company mechanically dredged approximately 900 tons annually (~2,000 yd³) of large woody debris from waterfalls edge dam for Portland General Electric to install new shear boom for protection of the power plant.

Background

The Willamette River is a major tributary of the Columbia River. Willamette Falls is located 26 miles from the mouth of Willamette at the Columbia River. The ***Willamette Falls is the second largest falls in the United States*** (behind Niagara Falls). It is over 1700 ft wide and vertically drops 42 ft with flows averaging over 20,000 ft³ per second (cfs). The falls are composed of basalt which occurred in the mid Miocene geologic epoch 15 million years ago. Winter flows can exceed over 250,000 cfs while summer low conditions are nearer to 5,000 cfs.

River levels at this site range with water flow. A recent high of 69.5 ft was recorded during the 1996 flood whereas typically during the summer elevations are 52 to 53 ft. The velocity of the water at the top of the falls is variable and at higher water levels (discharges) the velocities increase.

The watershed at the falls drains over 10,000 mi² of forested, agricultural and urban lands. The Willamette is noted for carrying significant amounts of large woody debris (LWD) which falls into the main stem or its numerous tributaries and which is then transported downstream. This woody debris is important to fisheries habitat and other important components of the riverine system.

Debris accumulates on the falls edge since it is one of few locations for debris deposition in the lower river. Trees and other LWD falling into the river are very common in the river. This debris is transported downstream during storm events. The extensive LWD in the river system is due to high variability in stream flow, unstable soils, long periods of

Debris Clearing on Falls

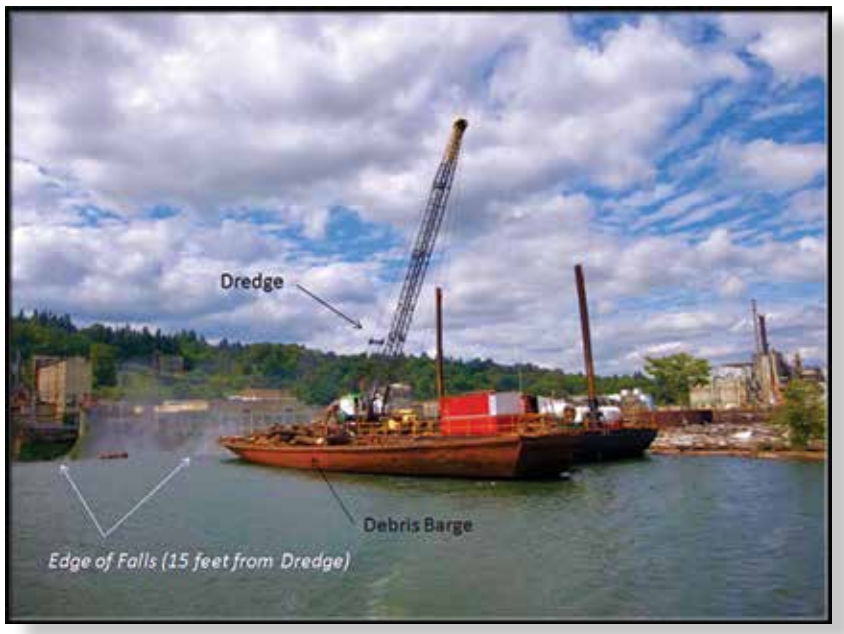
from pg. 35

fully saturated soils, intensive rainfall events and windstorms and other factors. There are very few depositional areas directly above the falls in the ways of gravel bars, shallow stream banks, or rocky areas. This lack of depositional areas creates potential stockpiles during larger winter events at the falls edge which acts as a trap.

The figure (left) shows the falls and where debris collects on the edge (on the dam) and on shears which protect adjacent facilities. Historically, in the 1870's, the Corps of Engineer reported how the Willamette floodplain was inundated to depths of several meters with logs in the river channel and in adjacent sloughs. Additional academic research has demonstrated the loss of riparian wood sources in the Willamette over the last 100 years.

T.W. Sullivan Power Plant

The T.W. Sullivan Power Plant is a hydroelectric system situated on the falls. Portland General Electric (PGE) owns and operates the plant. PGE has modernized the plant over the last 50 years. The plants low-cost and reliable electricity has become an important source of power for PGE's 828,000 customers. The systems is the ***oldest hydroelectric project in Oregon*** and the third oldest in the U.S. (1895) producing over 122 million kilowatt-hours in an average year.



The falls has a concrete dam which is about 3 to 4 feet high on the edge of the falls. This was completed at the turn of the century. To obtain additional flow (and head for power generation) in the summer, wooden posts are placed in drilled out holes in the dam and 2" x 12" planks are placed on the dam to raise the water level another 3 ½ feet. These boards are left in place in the summer. During high flows in the winter the boards and posts wash out.

PGE continues to do work on improving the dam and adjacent facilities. This has included improvement to fish bypass systems and flow structures as well as additional safety features.

Project Objective – Debris Clearing

The debris on the edge of the Falls is an obstacle for the boards which are placed on the falls to raise the dam's elevation in the low flow summer month. The debris needs to be removed to effectively place the boards safely. Since the project worksite is on the edge of the Falls, the location has some ***major potential safety hazards***. Access to the location is difficult due to numerous factors including:

1. Velocity and currents moving equipment to falls and/or turbine intakes (turbulent water)
2. Depth of water (see NOAA chart reflecting maximum depths of 7 to 8 feet) and minimum depths of 1 foot.
3. Hard basalt bottom making anchoring and spudding of equipment problematic
4. Extraneous hazards include snags, piers, overhead lines
5. Potential hazardous fall over edge of waterfalls and man overboard situations

Project Objective – Safety Handrail

In addition to the debris clearing, the MIC crew installed hand rails on sections of the falls to provide additional safety factors

for crews installing boards and scientists completing research projects on the Falls (lamprey and fisheries studies). The handrail installation required drilling 2 ½ inch diameter holes 12 inches deep into the original dam. Aluminum handrails were set into the holes and pinned into location. PGE1, understands that the project is a dangerous one -- sending crews in tugboats to the lip of the falls -- requires special equipment.

Marine Construction Equipment Available

The U.S. Army Corp of Engineers in fall of 2011 abruptly closed the locks at the Willamette Falls ending transport of commercial vessels between below and above the falls. The locks were operated previously at least once per month. The section of the river above the falls has limited marine activities and several companies/municipalities had equipment stranded by the abrupt and unannounced closing of the government facilities; Commercial operators (including tour boats, municipal ferries, mills and up river ports) have no access to down river facilities such as dry docks or supporting facilities. Currently only three tug boats, two barges, and one crane barge are located above the falls in the upper Willamette River. The numerous boats, dredges and barges in the lower Willamette River below the falls (i.e. the Portland Harbor) no longer could access the job site. Other alternatives, including putting a crane on portable barges, could not provide the level of safety the job site required.

1967 NW Model 95

Marine Industrial Construction

Marine Industrial Construction, LLC (MIC) was formed in 2009 by the Bernert family who started working on the Willamette and Columbia Rivers in the late 1800's and has continued doing marine construction, dredging, and marine towing for four generations. MIC primarily has its marine equipment in the Portland, Oregon Harbor. This newer and larger equipment could not access the project site due to the closing of the locks.

However, MIC still had an older barge and crane in the upper river at Wilsonville, Oregon undergoing maintenance. The barge mounted crane was an original dredge used to mine (dredge) sand and gravel in the upper Willamette in the 1950's to 1970s'. After the 1970's the dredge was only used periodically to unload materials. The crane mounted on the barge is a 1967 Northwest Model 95, which is a manual friction operated 40 ton crane. The crane has a 90 foot boom and had a modified smaller 2 cubic yard Owen's clamshell with custom teeth welded on the bucket. The teeth were made sharp and with wedges perpendicular to the bucket lip to penetrate and split logs into smaller pieces to load. This crane is significantly smaller than cranes the company historically used to perform the debris clearing.

Barges are needed to transport the debris away from the site. Only two transport barges exist on the upper river. One is

1 As noted in the local newspaper account at:
http://www.oregonlive.com/west-linn/index.ssf/2012/07/wilsonville_concrete_products.html

Debris Clearing on Falls

from pg. 37

used as a float at a mill and has a wood deck and the other is an old barge that was constructed by cutting the bow and stern off a World War II Admirable Class Minesweeper. This barge, which was used on the project, is capable of carrying 400 tons.

The route up to the edge of the falls is extremely narrow and shallow and requires shallow draft vessels. Two tugs were used: the Sarah B. (600 HP twin screw tug with a 5 ½ foot draft) and the Iris B. (250 HP single screw tug with a 3 feet draft). The larger tug was needed for transporting loaded barges to the unloading site but had a difficult access to the edge of the falls due to shallow water and old piers and rock cradles. The National Oceanic and Atmospheric Administration (NOAA) navigation chart indicates between 2 and 8 feet of water in the area adjacent to the east shore with most of the area above the falls having only 1 to 2 feet of water. The west side of the falls is also shallow with the exception of the primary flow directly into the turbines which can be up to 7 feet in depth. Rock piles and snags are also prevalent in the area above the falls and require careful navigation with shallow draft vessels.

Owens Bucket with modified Teeth

Since the only equipment available that could access the project site was older, a special focus was on the care and status of the boats, barges, and cranes. Maintenance of equipment has always been important to the company. "We have always focused on taking care of the equipment, performing maintenance and investing into the equipment as long as it has no safety or environmental problems," noted Dave Bernert, the company's President. "My father stressed this to us, just as his father did to him."

Project Details

The project included clearing debris and installing a safety hand rail at critical spots on the falls edge for protecting construction workers. The work started in July of 2012 and was completed by August of 2012. *Tim Bernert* was MIC Lead Operator and Supervisor.

Initial clearing of the logs sitting on the dam required using the small tug (Iris B) to access the site. The skipper of the vessel was required to be in constant contact with a lookout posted watching the depths and looking for snags from the barge and an observer on the shore. During the project *over 900 tons of wet debris* were loaded, transported and offloaded. The LWD is being used in several off site restoration projects. Volume of the material was estimated at 3,000 cubic yards and was over 8 barge loads. Also found in the debris was an older 19 ft fiberglass boat, several tires, three old docks and other assorted flotsam.

Tim Bernert has done this job numerous times since the late 1970's but noted how much more challenging the project was this year using smaller boats and cranes than were used previously on the project. Also Tim noted 'this is the most material we have removed in one year'. Typically only maintenance is completed and the major debris is removed. This year, PGE installed a new shear boom, which required cleaning all the material from the area.

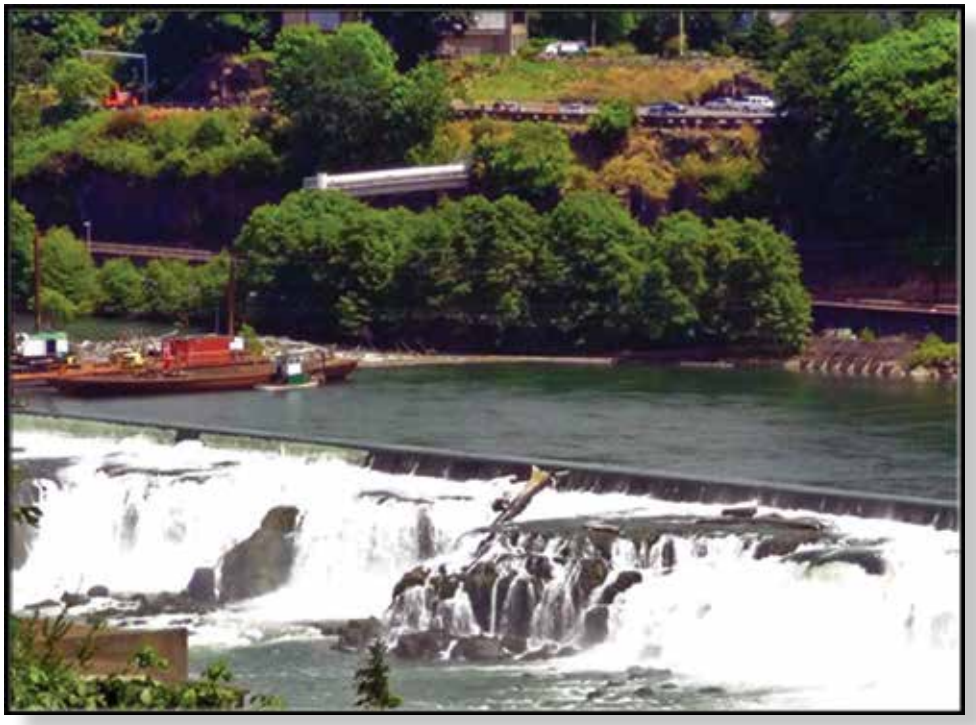
Summary

By using older well maintained equipment, an experienced crew and good coordination, MIC and PGE were able to effectively clear debris from a dangerous worksite. No accidents occurred and a safe work site was maintained. PGE placed the boards on the falls, installed a new shear boom and were able to increase the power generation capacity at the location while providing a safe working environment. The MIC crew focused daily on safety at the work site ensure to proper Personal Floatation Devices, fall restraint and other personal protection equipment was used at all time. MIC crew and PGE kept in constant communication using VHF radios, cell phone, daily digital reports and routine meetings.

Safety is very important to MIC during all operations but the owners and employees of the company have a special respect for Willamette Falls. Josef Bernert (1847-1912) originally started the family business of working on the river rafting logs in the late 19th century. In January 1912 during a rain on snow flood event, the Willamette River increased its flow over 100,000 cfs in one day. While running his boat during this flood, Josef lost control and his boat and was flushed over the falls. His body was never found but the bow of his boat was later found 3 miles below the falls washed ashore. Now Josef's

great-great grandchildren continue the family tradition working on the river. It is important to them and all the company's employees to ensure a safe working environment.

The PGE Willamette Falls project demonstrates how an experienced crew using well maintained older equipment at a potentially dangerous work environment can perform a project without any incidents or accidents. MIC returned in the summer 2013 to the site above the falls and only a partial barge load of material had accumulated. Overall, the new shear boom is working the way it was design to and debris is not accumulating.

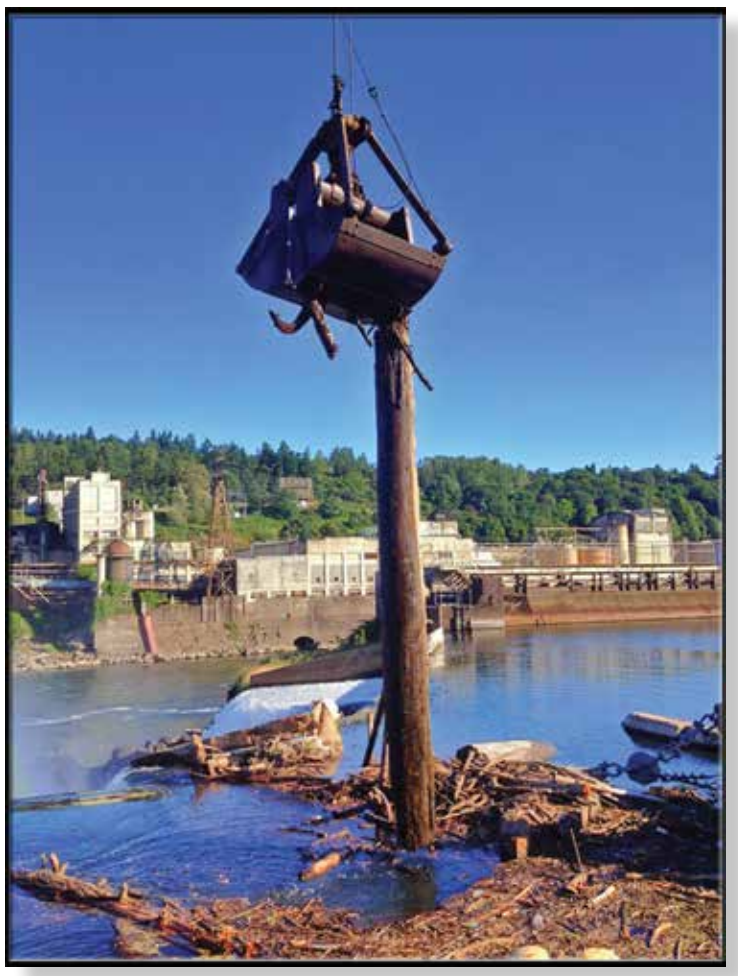


2012 Dredging on Fall Edge

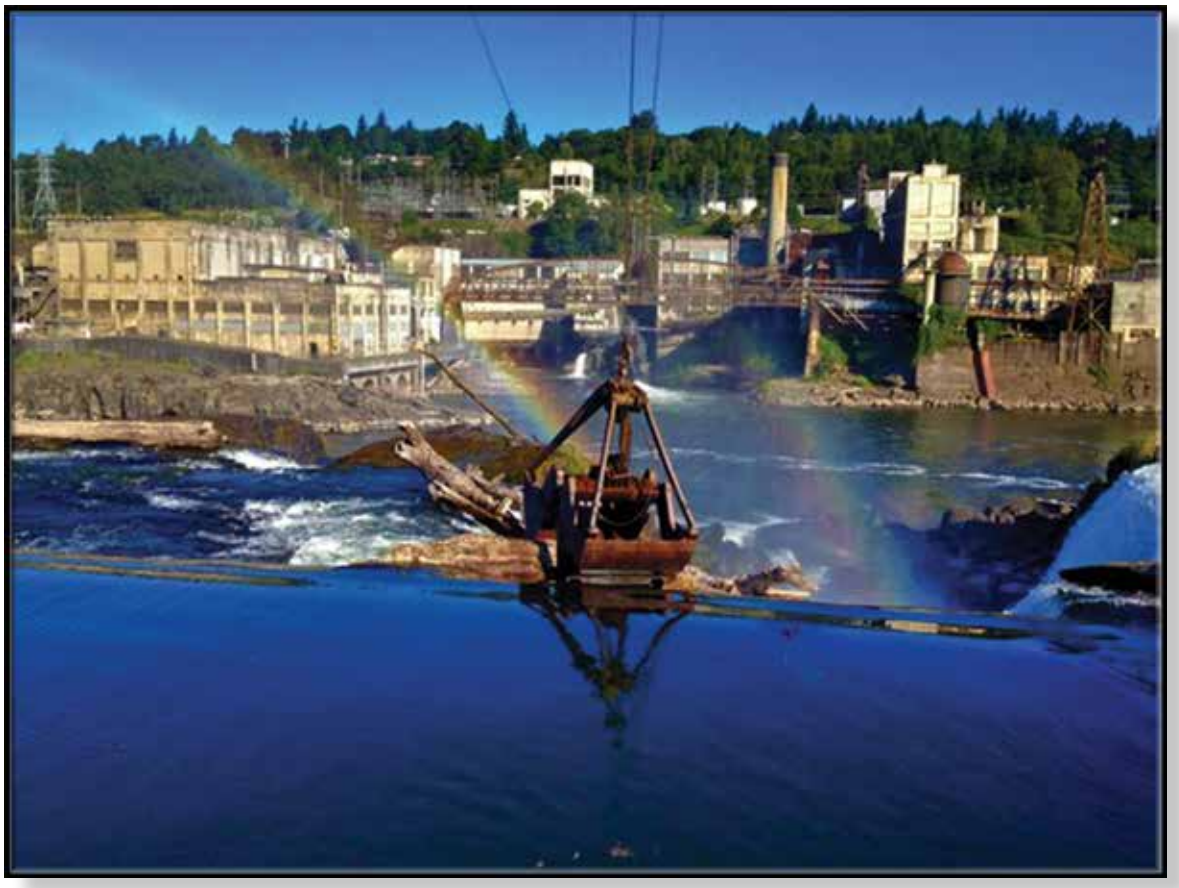
Debris Clearing on Falls

from pg. 37

Tom Barrell operating crane on above edge of falls



2013
Lift large woody debris on edge of falls to barge



In 2013 significantly less debris on edge of falls. Remove debris on edge.

Photo from across river of dredge with partial load of LWD

Debris Clearing on Falls

from pg. 37

In 2012 significantly more debris had accumulated taking several weeks to clear.

MIC (Joe Bernert Towing) has been doing this job for over 40 years (pictured here in 19) ❍

Business Card Directory

Classified

Advertisers Index

Continental
The Future in Motion

E+S
Division ContiTech of Continental AG

Big Bore Rubber Hoses
for On- and Offshore Application

Eddelbüttel + Schneider: Across the globe, this name stands for quality in industrial drilling, dredging, and special hoses for offshore applications. Regardless of whether you want to extract and transport gases, fluids, granulates, or abrasive solids, we as an innovation leader develop and produce hoses for systems tailored to meet your particular needs. As a subsidiary of the ContiTech Group, we combine diverse project experiences with the unlimited opportunities of a company operating worldwide. This alliance of strong partners enables us to react quickly and flexibly – all around the globe. **www.e-s.de**

hhesinfo@fluid.contitech.de
Eddelbüttel + Schneider GmbH
Hannoversche Strasse 88
D-21079 Hamburg
Phone +49 (0) 40 767 366 - 0

ContiTech

Van Oord

Marine ingenuity

Marine ingenuity

Get more info with layar

Dredging

In just two words, marine ingenuity, we express that we are passionate dredging and marine contractors with a worldwide innovative approach to meet your challenges. Our people - who manage a versatile fleet - specialise in dredging, marine engineering and offshore projects (oil, gas and wind).

www.vanoord.com

Offshore Oil & Gas

Offshore Wind Projects

Dredging and Marine Contractors

Sloping Profile

Allows for angled, lateral movement along an inclined bottom. Previously, over dredging in "steps" were required. These steps are then often filled in with capping material.

Oversized, Over-Square Footprint

Width greater than opened length minimizes outward windrowing flow of material during bucket closure. Footprint determines size of cut. A larger footprint size is designed for shallow face dredging.

(up to 100 m^2)

Lightweight

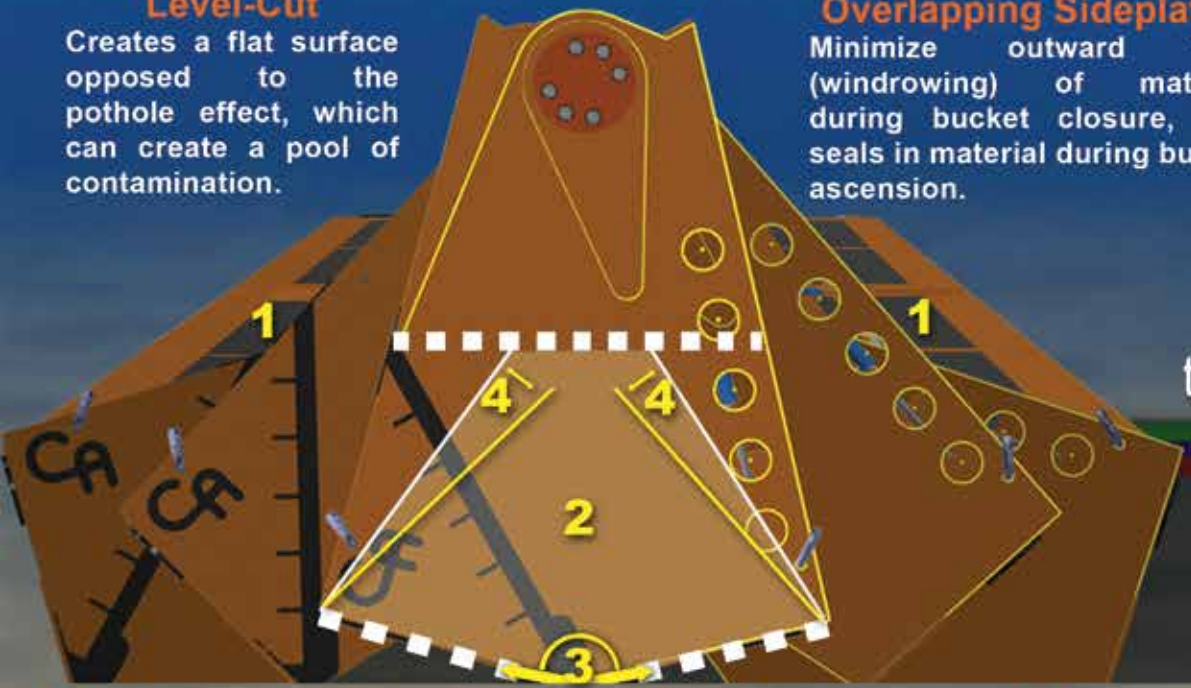
Eliminates the processing of hard, uncontaminated sediment.

Level-Cut

Creates a flat surface opposed to the pothole effect, which can create a pool of contamination.

Overlapping Sideplates

Minimize outward flow (windrowing) of material during bucket closure, and seals in material during bucket ascension.



Depth of cut
& adjustable
top screen plate
changes volume
to reduce free water content

*dredging operation examples

816 ft^2 (75m^2) footprint

1. Venting System with open center decreases downward pressure during bucket descension, and seals in material during bucket ascension.
2. Center of Mass of material is located below the center of the bucket's containment area, minimizing material washout during bucket closing and ascension.
3. 150° Cutting Edge allows the bucket to "scoop" material, which lowers the material's center of mass within the containment area.
4. Adjustable side screen plate determines depth of cut.

Cable Arm

www.cablearm.com info@cablearm.com

CLAMVISION®