



APE Quad 400

for super larger diameter caissons

www.apevibro.com



APE Model 400 Quad installs 44 foot diameter caissons in Pearl River in southern China. Piles are over 100 feet long. Soil conditions are up to 50 blow count sands and clay.



Quad 400 shown here with massive additional beam mounted under standard caisson beam to allow adaptation to larger 44 foot diameter steel piles.



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40 foot diameter concrete piles weighing more than 1.3 million pounds are transported down the Yangtze River in China.



Pile crew, including Jim Kruh (third from right) and David White (second from right) pose for a group picture after driving the world's largest concrete pile.



APE crew cheers after driving of first 40 foot diameter concrete pile in Yangtze River.



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Jim Dizard of Controlled Power, a supplier of electronic technology for APE, demonstrates the capabilities of the new monitoring system used on the Model 400 quad vibratory pile driver/extractor.



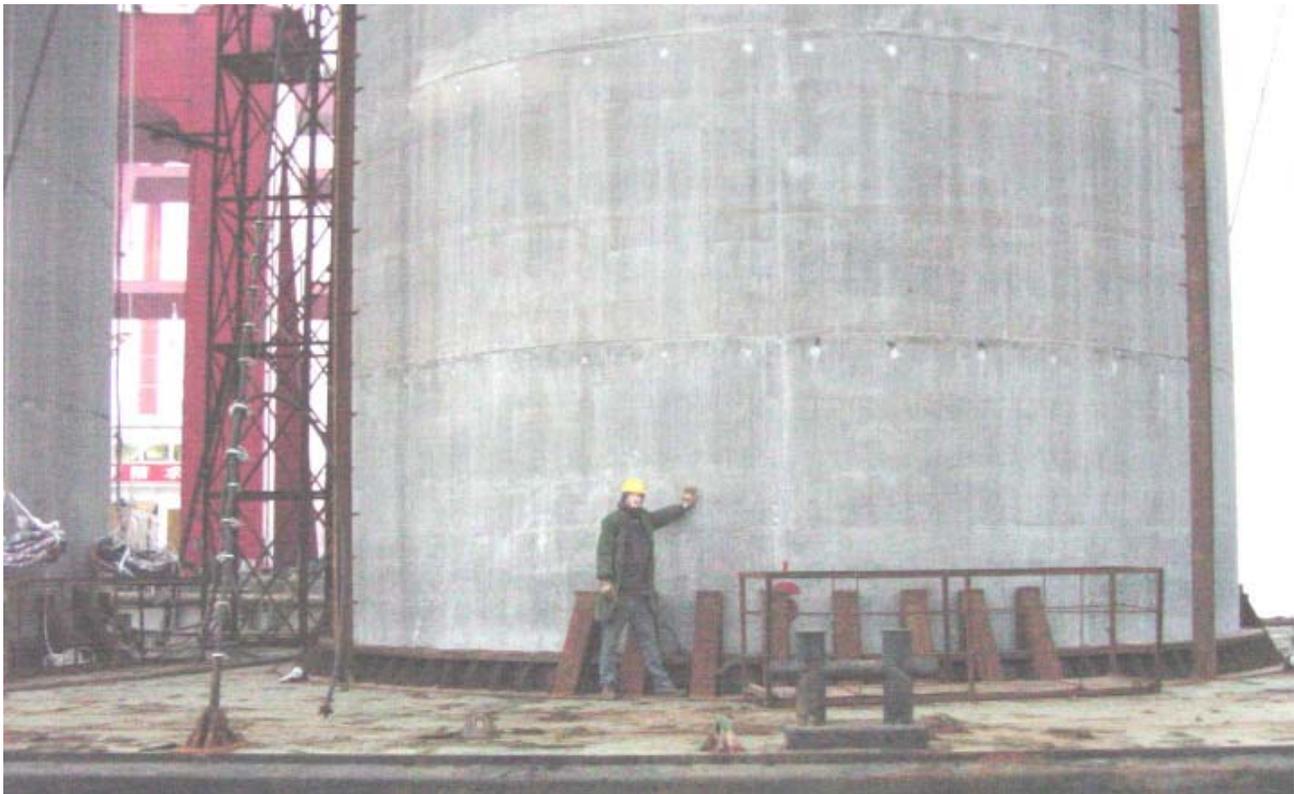
Four APE Model 1000 power units teamed together to provide 4000 horsepower to drive the APE Model 400 Quad Vibratory driver/extractor. Four CAT 3412E electronically controlled engines are fitted to a special control system.





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A 40 foot diameter concrete pile weighing over 1.3 million pounds is hoisted using the APE Model 400 Quad. The suppressors are stretched nearly to the limit for over four hours as the pile is transported down river while hanging in the eight jaws of the vibro.



David White stands next to one of the 40 foot diameter piles 68 foot in length with a 10 inch wall thickness. Over 50 sensors were cast inside the pile to measure soil loads and all dynamics.



Left to Right: Jim Wahl of Driveline Services, Jim Dizard of Controlled Power, Jack Xu of APE China, Jim Kruh and Kelly Goranson of APE USA in Shanghai, China.



Jimmy Dizard, from Controlled Power, Bellingham, Washington, shows the Chinese pile drivers how the APE monitoring system works. The system controls all four power units at the same time and can display all functions including clamp pressure, drive pressure, engine rpm, vibrator speed and also allows for independent control of each power unit.





A 1200 ton crane transports the APE Quad Kong down the Yangtze River on its way to the mouth. The APE Quad System is driving two walls of 40 foot diameter concrete piles.

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Four giant concrete piles stand in a row. Each pile is 40 foot in diameter and weighs more than one million pounds.

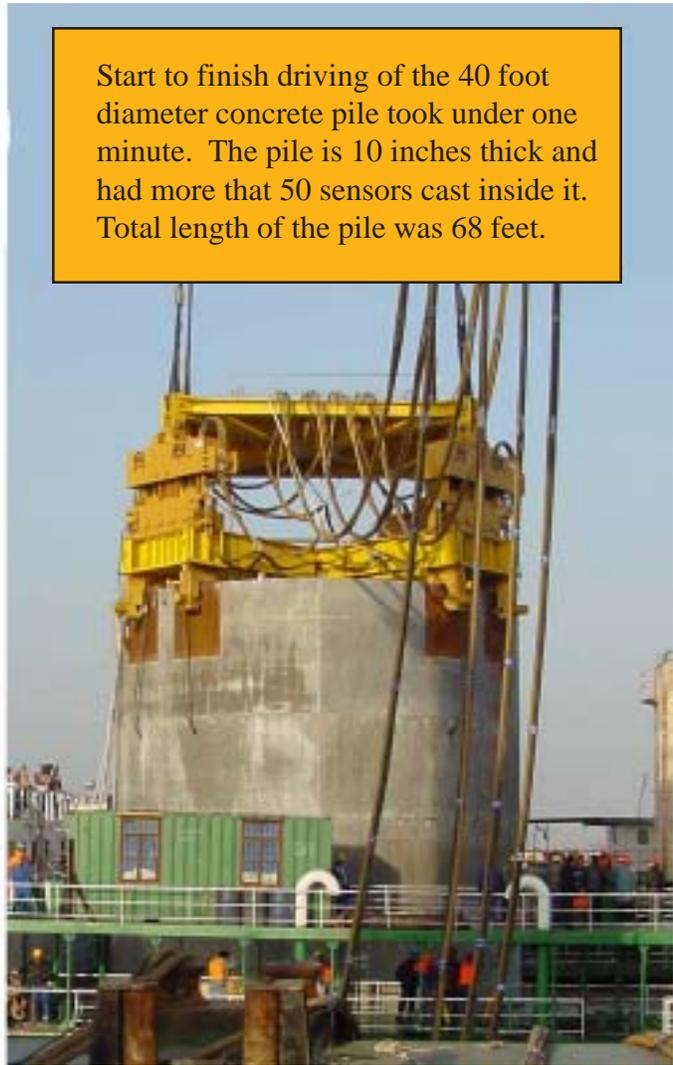




The first concrete pile was driven as fast as the crane operator could lower the block.



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Start to finish driving of the 40 foot diameter concrete pile took under one minute. The pile is 10 inches thick and had more that 50 sensors cast inside it. Total length of the pile was 68 feet.



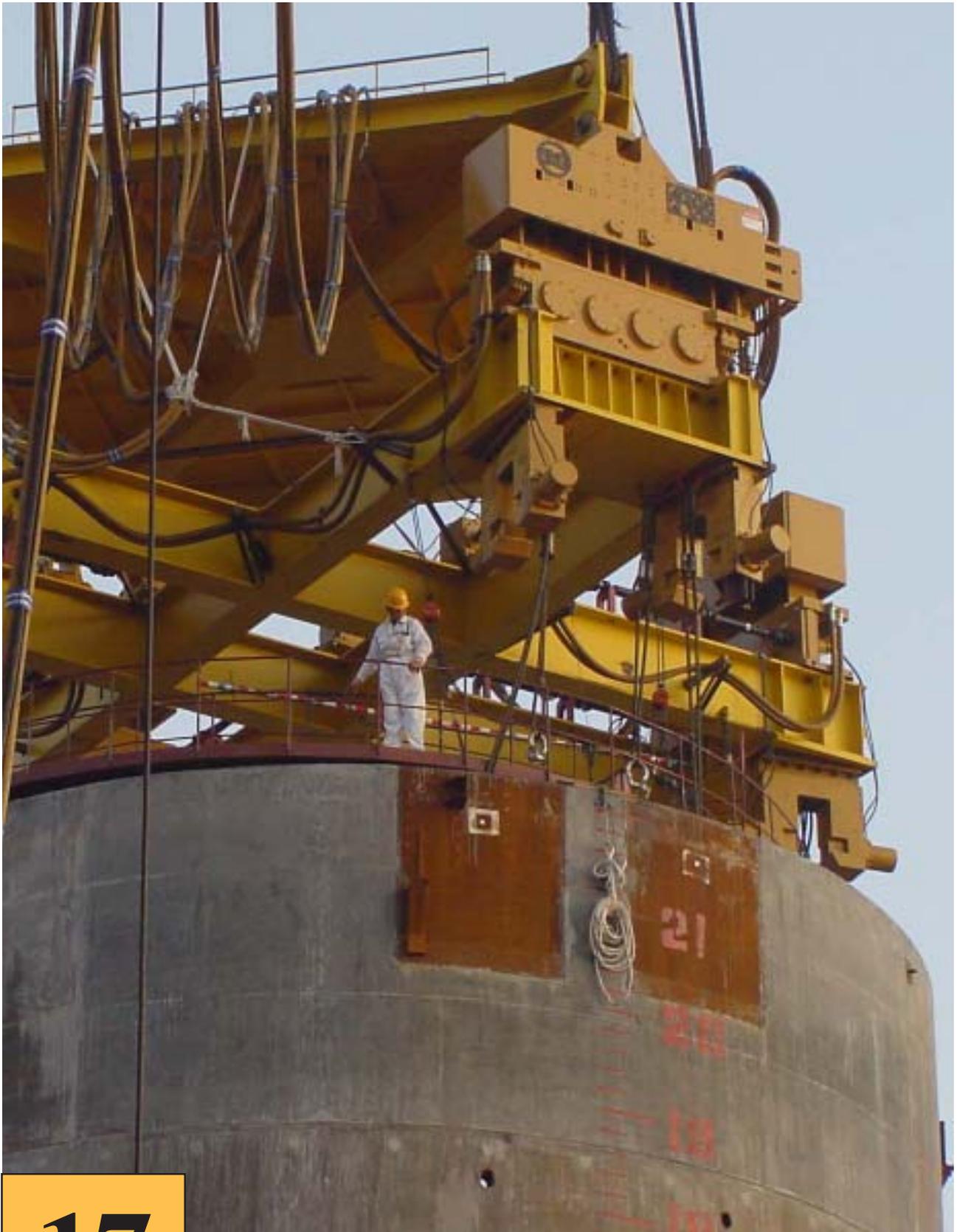
A small Army of engineers prepare to mount sensor wires to computers just prior to driving the first pile.



Wendy Settlege, wife of Randy Settlege of Agra Foundations, John White and Teresa White pose for a picture after initial testing at APE factory in Kent, Washington.







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Steel plates were cast into the piles. These plates and the pile were designed by both APE and Chinese engineers. The eight clamps grip the area of the pile where the plates are located.



APE Quad 400 shown with all sensor wires hanging from the system as it is about to be placed on the first concrete pile.



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Top picture shows 44 foot diameter piles being driven in the Pearl River using a 500 ton barge crane. Bottom picture shows the standard quad beam with a special larger caisson beam attached below it. Notice the drive timing shafts and one of the four Model 400 vibros.



A good look at the 44 foot diameter steel piles driven in the Pearl River.



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David White, APE China, waits in the 105 degree heat while the pile crew takes forever to set the piles. Both David White and Jim Kruh of APE were on site during both projects.



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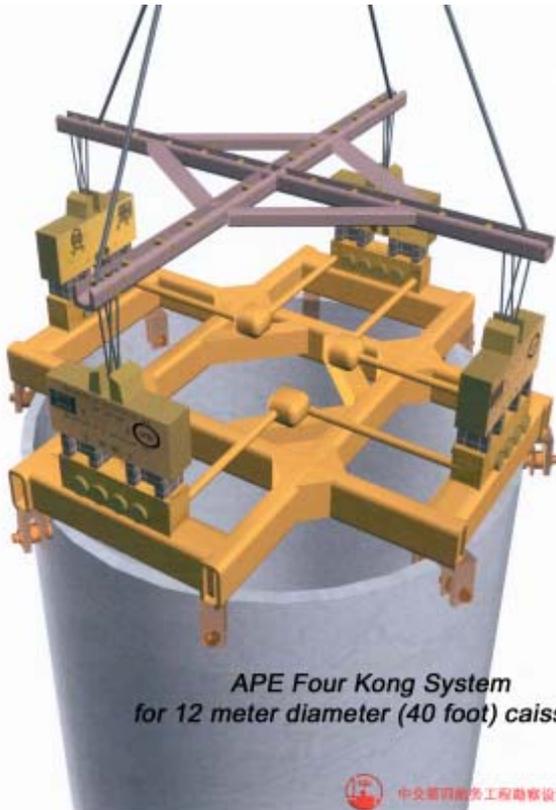


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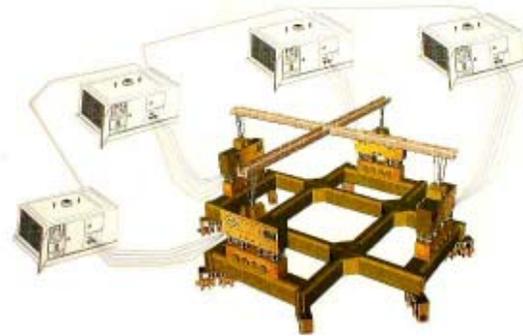


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**APE Four Kong System
for 12 meter diameter (40 foot) caissons**

中交第四航务工程勘察设计院

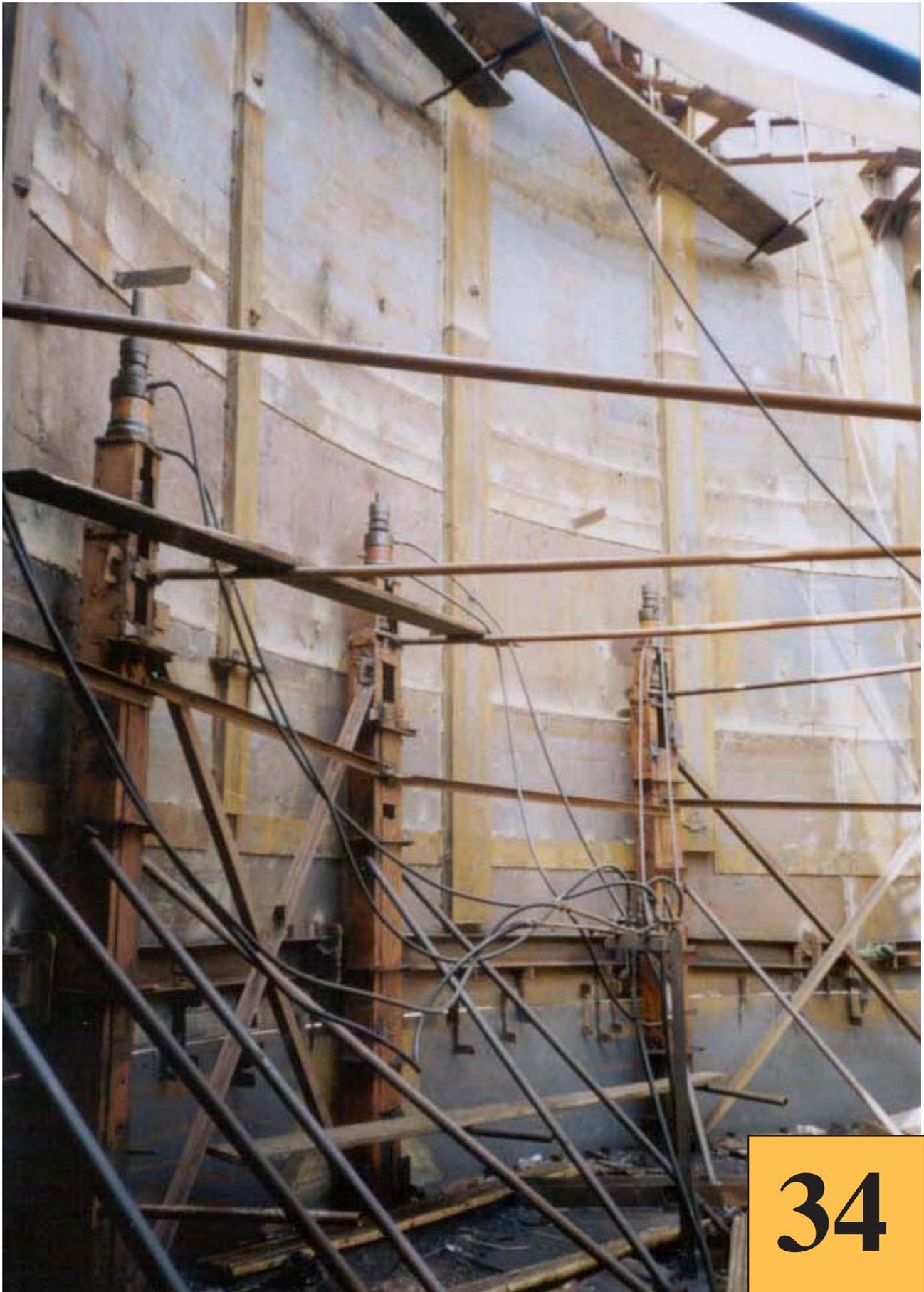




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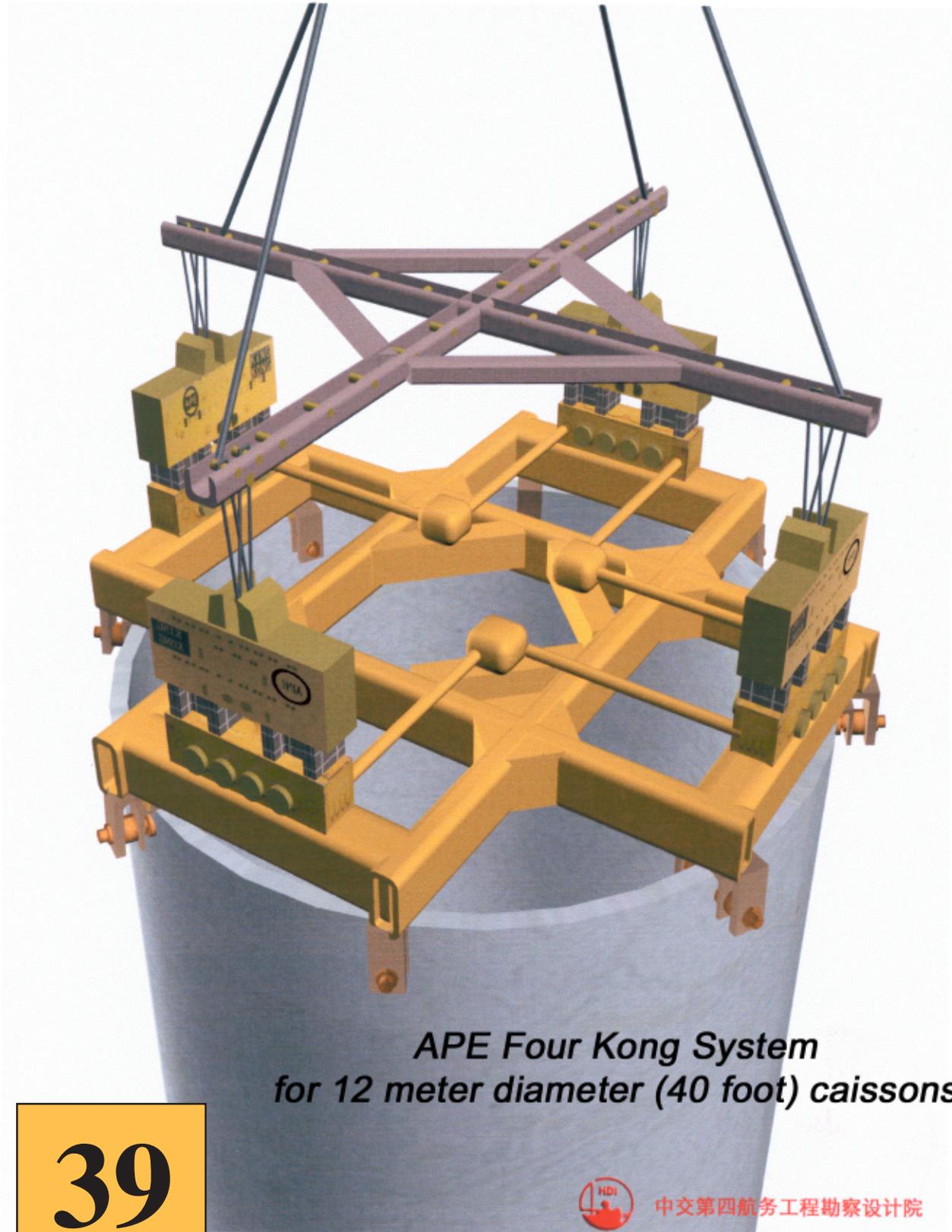




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美国 APE400 型振动锤振动系统示意图



*APE Four Kong System
for 12 meter diameter (40 foot) caissons*

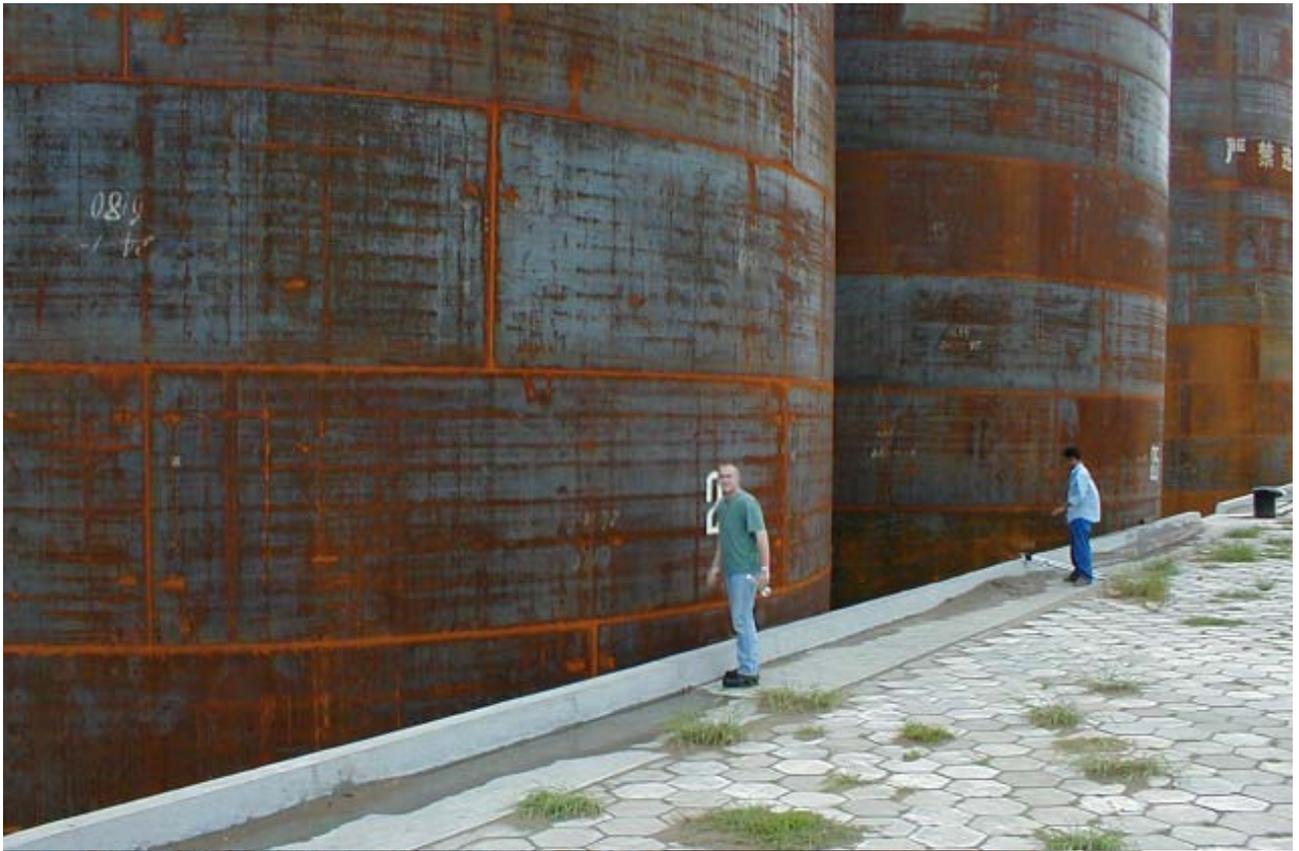


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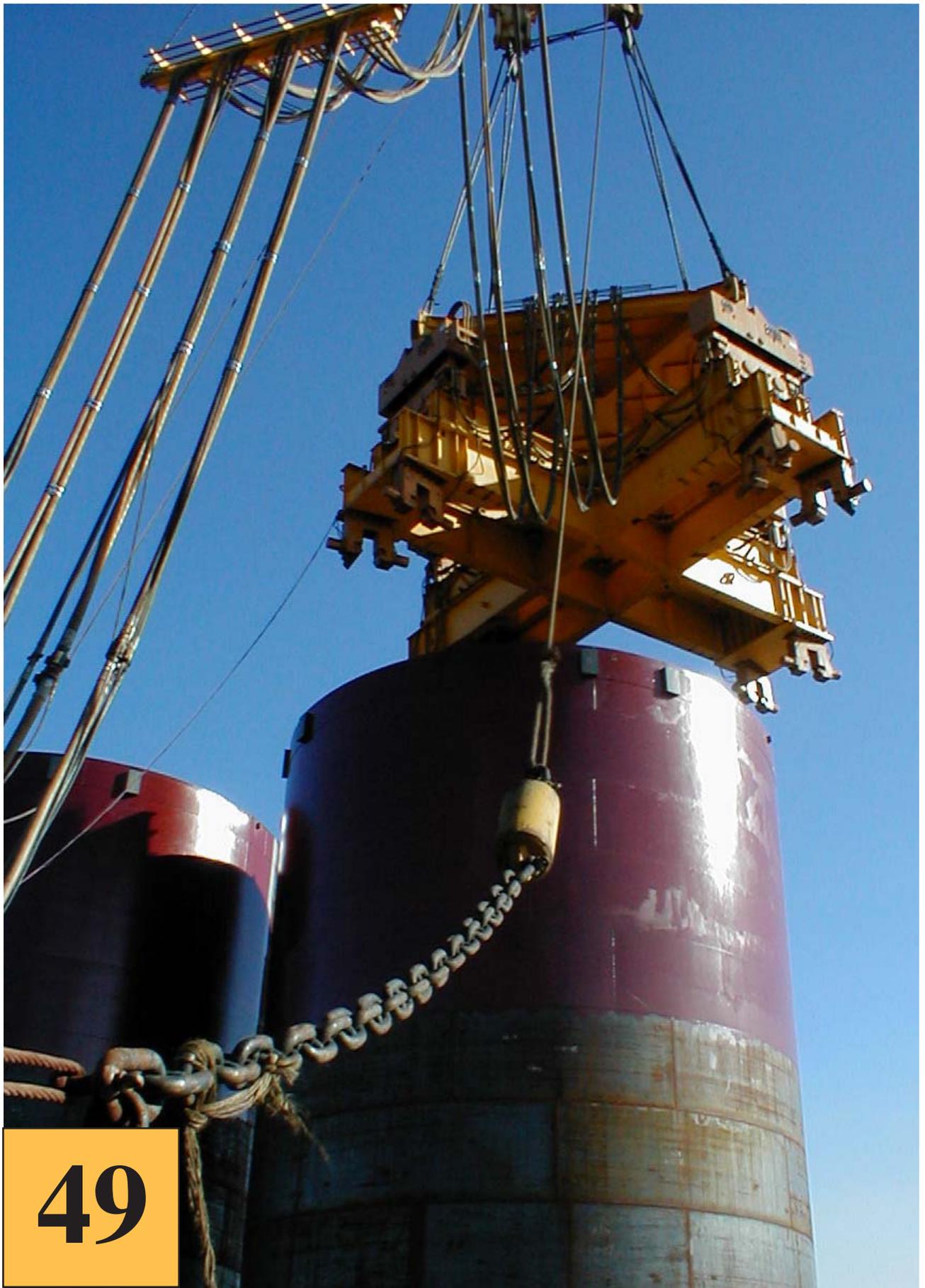
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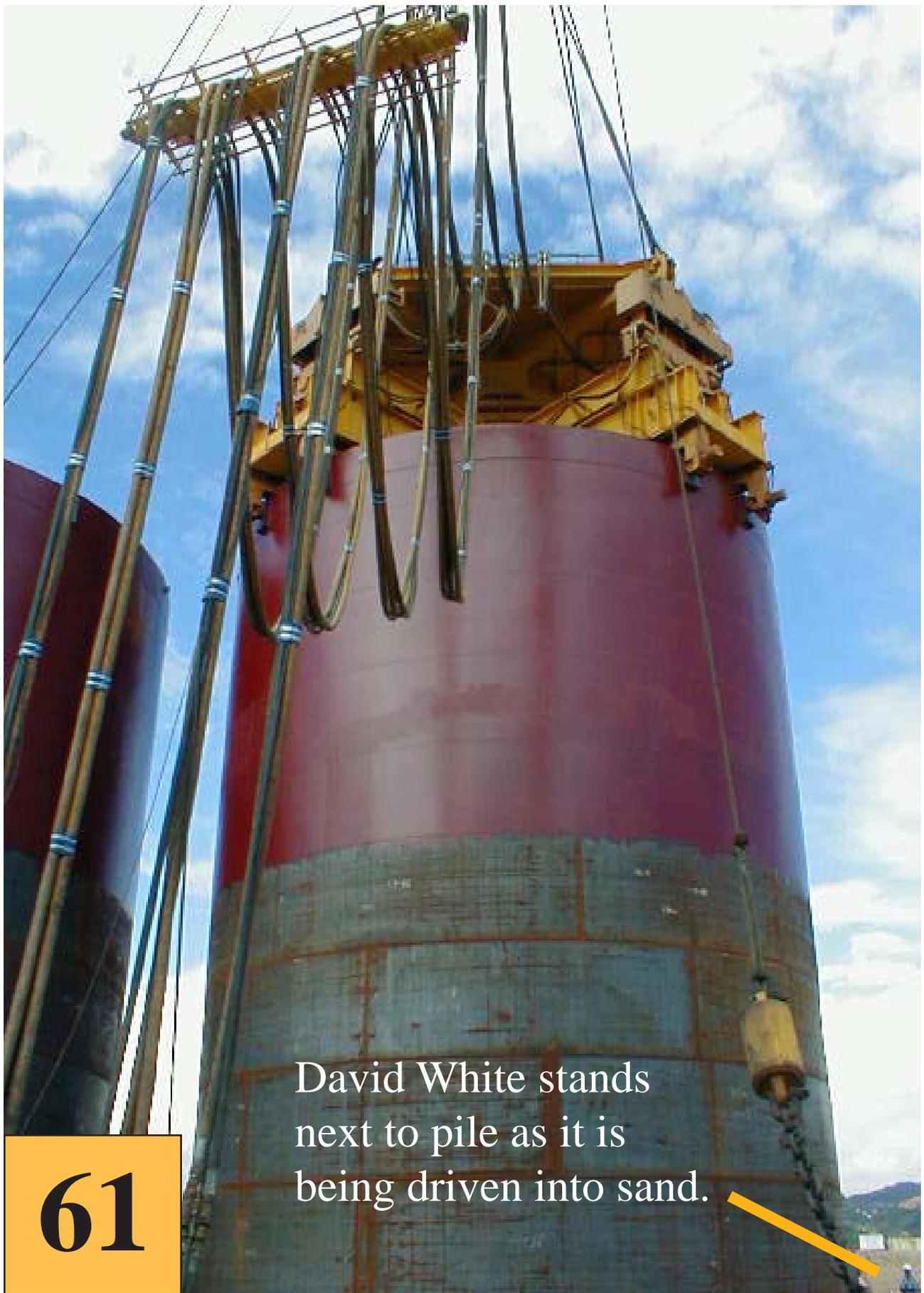
The set up and installation of both the 40 foot diameter concrete piles and the 44-foot steel piles was accomplished by Jim Kruh and David White.



Jack Xu, Managing Director for APE China, stands on Caisson beam of Quad Kong System Dec 2001

Jack Xu stands next to the four Model 400 vibros mounted on a test caisson beam at the APE testing facility in Kent, Washington. A full scale test was made prior to shipping the equipment to China. The test beam still remains at the testing site in Kent to be used for future projects.



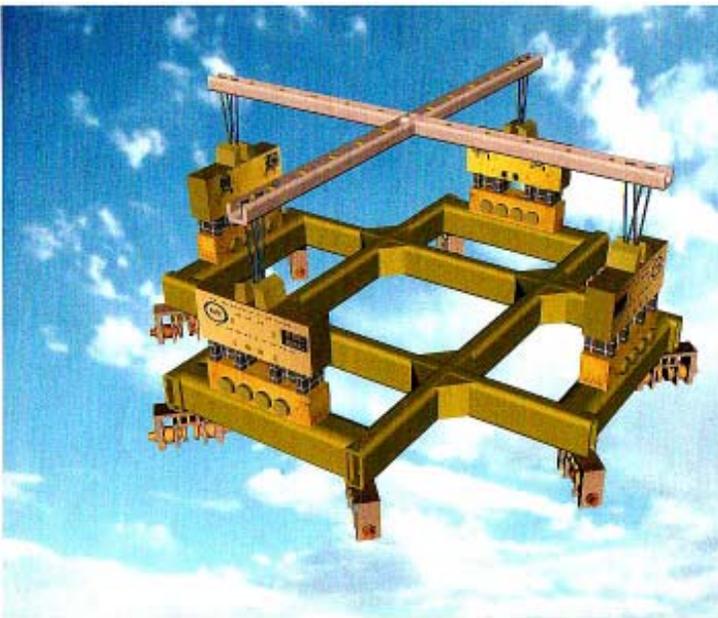
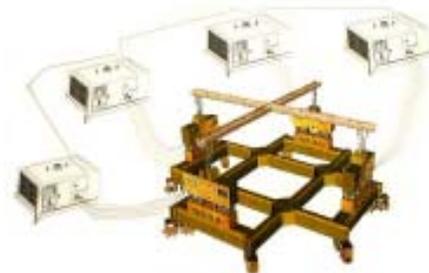
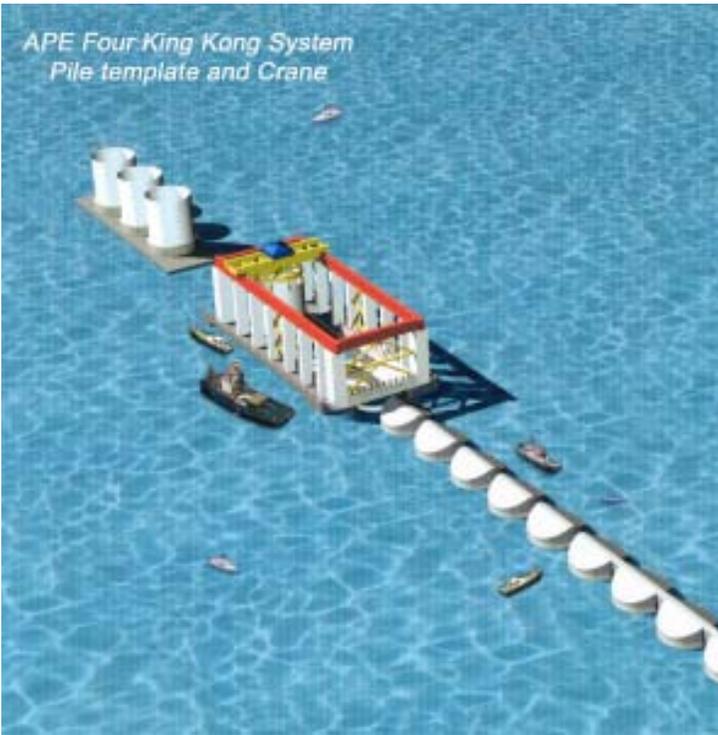


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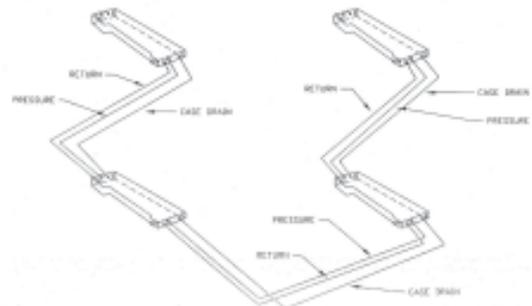
David White stands next to pile as it is being driven into sand.



美国 APE400 型振动锤振动系统示意图



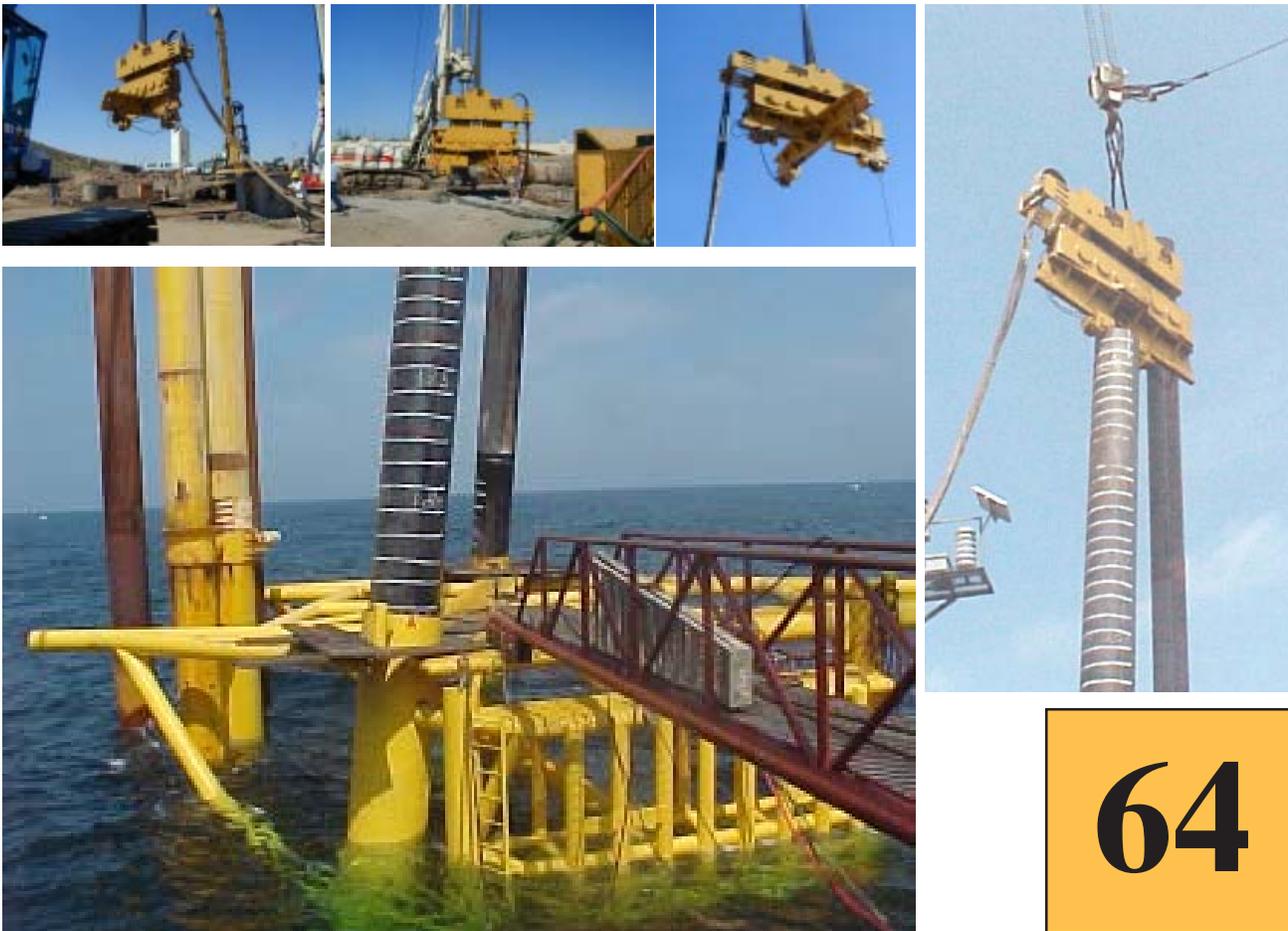
Joining the manifolds to balance hydraulic pressure



The APE Model 600



The APE Model 600 is a larger version of the APE Model 400. The 600 has 20,000 inch pounds of eccentric moment. The design is a stretch version of the Model 400. It has six counterweights.





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The Model 600 (shown above) is being used as a single unit to drive casings in Arizona. The contractor is Agra Foundations. The 600 vibro is the only vibro that has successfully broken through the rock and cobble layers in Phoenix.

World Record



40-foot diameter with 10 inch wall

In addition to all APE employees, APE would like to thank the following individuals and companies that participated in the development of the APE quad vibrator, which recently broke world records by installing the largest concrete and steel piles in the world.

Bernie Klinke, Summit Engineering, Seattle, WA.: Chief Designer of the APE Model 400 as well as all APE products

Gary Kranz, Western Dynamics, Portland, Oregon: Chief Hydraulics engineer for all APE products

Mike Dizard, Jim Dizard, David Wilder, Controlled Power Inc., Bothell, WA.: designers of all APE electrical systems

Jack Xu, American Piledriving Equipment, Inc. International Export Officer

Bob Grothen, Jerry Grotting, Del Cuelhoruiz, Hydraulics Industries, Kent, Washington

Hud Collette, Machine and Fabrication, Kent, WA.: Fabrication of all APE vibrators

Larry Frazier, Pacific Fabrication, Tacoma, WA.: Fabrication of power unit housings

Roger Shaffer, Rick Robertson, Pacific Power Tech, Tukwila, WA: Hydraulic motors and pumps

Andy Collins & Jeff Allison, Pacific Rubber, Seattle, WA: Hydraulic hoses and fittings

Steve Favarite & Ron Socall, Western Fluid Components, Tacoma, WA.: Hoses and fittings for all power units

Nausher Khan & Brant Briody, Bill Kallgren, Gary Lee, NC Power Systems: Supplier of the four CAT 3412, 1000 HP engines

Jim Wahl, Driveline Services of Portland, Portland, Oregon: Supplier of the timing shafts and components

Ken Danberg & Don Cutherell, Midpoint Bearings, Ontario, California: Bearings. pump drives

Basil Skalenakis, Rasmussen Wire Rope and Rigging Co., Seattle, WA.: Rigging

Bob Shumway & Art Cleveland, Shareway Industries, Auburn, WA.: Gears and pinion drives

Joe Perez & Chuck Kleiser, Northwest Castings, Seattle, WA.: Castings for eccentrics for all APE vibrators

Mark Teeple, High Strength Bolt, Kent, WA: All fasteners

Pam Gallagher, Eriks West, Seattle, WA.: O-rings and seals

Grahame Hutchinson & Ken Davies, Vulcanite Ltd., Sidney, Australia: All elastomers for APE vibrators

Jim Law, Spencer Industries, Seattle, WA.: Oil coolers, site glasses

John Schelling, ISSPRO, Kent, WA.: Gauges

Bob Bown, American Flex, Seattle, WA: Exhaust systems

Lynn Larrison, Danzas, Seattle, WA.: Handles all international freight, including L/C documentation

Patty Ritchey, Hydraulics Inc, Fort Worth, Texas: High pressure hydraulic quick disconnections

Tony Sichmeller, Hub City, Aberdeen, SD.: Gearboxes

Steve Gough & David White, APE International Sales

Al Russell, Applied Industrial Technologies, Kent, WA: Bearings

Lou Sweeten, L.T. Sweeten Co., Kent, WA.: Welding technology

Jeff Harp, Ram Treat, Kent, WA.: Heat treating

Chuck Savage, Pioneer Industries, Tacoma, WA: Paints and coatings

Michele Skavlem, Alaska West Express, Inc., Tacoma, WA.: All Transportation of APE Equipment

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