MAY 2010 MEETING

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TECHNICAL PROGRAM

Infrastructure Solutions to Modern Port Problems

Speaker:David Borger with Skyline Steel, Tel. 973-795-1424

David Borger is the engineering supervisor for Skyline Steel and has been working for Skyline in the steel piling industry for thirteen years. His work focuses on the design and promotion of steel bearing piles and sheet piling throughout North America. Mr. Borger graduated from the University of Illinois with a BS in civil engineering.

PRESENTATION SUMMARY

To an audience of about 60 at the HESS Club, Mr. David Borger presented information on Infrastructure Solutions to Modern Port Problems through the use of steel piles. He said his company, Skyline Steel, is a wholly-owned subsidiary of ArcelorMittal, the world's largest steel supplier. Skyline Steel is an international company with offices around the world including multiple sales, manufacturing and fabrication facilities throughout North America.

A large variety of steel pile products are available and may be designed and tailored to fit specific job requirements. Free design software for the steel products may be found on the Skyline Steel **website**. Skyline Steel also offers design services and support to its clients.

Products manufactured and fabricated by Skyline Steel include sheet pile systems (both cold formed and hot rolled), H-piles (HP), pipe piles including extruded pipe, sheet pipe and spiral weld pipe. Each of these products has specific advantages for specific applications. Skyline also produces many if not all the necessary accessories for the successful installation and completion of pile systems.

Where older steel products were used the available grades might have been 36ksi to 50ksi. Modern steel pile grades currently range up to 80ksi offering engineers much greater design flexibility and options. A36 steel has not been supplied in the last 10 years. When they try to make it, it tends to have a 52 ksi yield so it is stamped Gr.50. Newer H-pile sections are available including 16" and 18". These new larger and stronger sections require fewer piles and reduced installation costs.

Spiral weld pipe is one of the more versatile products since it is manufactured from sheet steel welded from both sides in a continuous spiral joint using submerged arc welding. The fabrication process allows a greater range of sizes from about 8" in diameter up to 120" diameter. Spiral weld pipe wall thicknesses range from about 3/16" to 1". The largest spiral pipe they have driven was 60" diameter x 1.25" wall.

Spiral weld pipe is less expensive than extruded or rolled pipe. Long sections in excess of 170 feet may be manufactured with the length limit dictated by shipping requirements so the expense of girth welds is not incurred. It can be manufactured to the length needed so there is little waste. Spiral weld pipe currently costs only $1150/ton, whereas straight seam pipe costs $1700/ton and seamless pipe costs $2500/ton. All three options are available in diameters up to 24".

Rolled and welded pipe sizes range in diameter from 24" to 192". Wall thicknesses of rolled and welded pipe go up to 3" thick.

Sheet piling is made in yields up to 65 ksi. Corrosion allowances for sheet pining used as marine cofferdams is on the order of 3.75 mm (0.15") for a 50 year life. When the water depth is greater than 20 m (66 ft) depth, it is necessary to

reduce the effectiveness of the cantilevered design due to the high water pressures. Rather than retrieve the sheet piling from a cofferdam used to construct a bridge foundation, it may be cost effective to leave it in place to prolong the life of the bridge foundation by prevention of scour and vessel impacts. Mr. Borger noted that studies have shown that scour accounts for 57% of bridge failures in the US, i.e., more than all the other reasons combined.

Approximately 80% of the Skyline Steel products are manufactured from recycled steel. 100 year old steel piles have been excavated from deep embedment (approximately 100 ft) that exhibit little loss to corrosion.

For tables and software go to the Skyline website by clicking **here**.