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AWARD

To recognize innovative techniques and methods, applied on actual projects or in activities or processes, which improved the quality and/or reduced the cost of construction.

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INTRODUCTION

Birmingham has been revolutionizing the foundation industry with its bold and innovative approach to every project. Birmingham supplies high quality, project specific equipment, serviced by a world-class team of designers, engineers and field personnel. Birmingham Piling systems demonstrate the company's strength in harnessing over 125-years of construction experience with innovation and practicality in equipment design and manufacturing.

The Genesis of the EML30 Excavator Mounted Lead for 30 ton Excavators originated in two places – Birmingham Construction and Birmingham Equipment divisions separately. Birmingham (Contractor) had been approached by several general contractors requiring shoring and bridge foundation work in Northern Ontario (1,000+ km away from Birmingham's Hamilton office). They would ask if there was anything Birmingham could do to lower their price on foundation elements. Birmingham explained that the cost of the work was relatively minor to the cost of mobilizing/demobilizing the equipment to the remote site 1,000+ km away. The costs associated with transporting a crane to the remote locations were significant. Some cranes that would complete similar work require as many as 3-4 truckloads to transport them to a construction site. This meant transportation and setup costs could total over a \$100,000 for a single project in cases when there were many remobilizations or many structures. Knowing that the crane mobilization was highly cost prohibitive; Birmingham conceptualized a piling lead that could attach to an excavator, even an excavator that would likely already be on site working with the General Contractor. This meant that the entire piling system could be transported on either a truckload by itself or in combination with the excavator on a float in its entirety.



Concurrently Birmingham had been approached by several contractors in the United States and Canada to design and manufacture several custom excavator mounted lead systems for similar applications. With the momentum from both sides of the company as well as a local piling project ready for a trial, Birmingham began work on a prototype. In 2008 Birmingham developed a small, crane-mounted semi-fixed pile driving unit for the U.S. Army and manufactured 130+ units.

The first EML prototype utilized the lead components of the army system and attached them to an excavator. This concept allowed Birmingham to identify areas for improvement. An example was the ability to level the lead for uneven ground conditions as it was determined to be very labour intensive to block up the excavator on uneven ground.

FEATURES

- 1,600kN ULS Factored Geotechnical Resistance based on 3,200kN Mobilized Geotechnical Resistance*
- (A Driven Pile is a Tested Pile!)
- Designed to drive 30' Sections HP12x74/ 310x110
- Side slewing for level correction
- Sheeting Anvil Option Available

Base Machine	30 US ton	27.21 tonne
Total EML System Weight (excluding pile & excavator):	17,950 lbs	8,142 kg
Weight of Drop Hammer & Anvil	8,850 lbs	4,014 kg
Drop Hammer Stroke on Leads	33-ft 4-in	10.16 m
Total Lead Length	42-ft 3-in	12.88 m
Shipping Length of Lead Assembly	37-ft 0-in	11.28 m
Shipping Height of Lead Assembly	6-ft 9-in	2.06 m
Shipping Width of Lead Assembly	5-ft 9-in	1.75 m
Pile Line Winch - (single part)	12,000 lbs nominal lift capacity	53 kN
Gate/Tool Guide Opening Diameters	18.5-in	0.47m
Working radius – Vertical Driving (center of excavator to center of pile):		
Approximate Maximum Reach (360°) (Dependant on Excavator Model)	20 ft	6.10 m
Approximate Minimum Reach (360°) (Dependant on Excavator Model)	15 ft	4.57 m
Side-to-Side Slewing	+/- 3 Degree	
Drop Hammer Mass	8,000 lbs	3,628 kg
Standard Anvil Mass	850 lbs	386 kg
Sheeting Anvil Mass * Sold Separately	1,400 lbs	635 kg
Potential Energy (7ft Drop)**	56,055 ft-lbs	76 kJ
Measured Energy (7ft Drop)**	42,041 ft-lbs	57 kJ
Efficiency of	0.75	

* Geotechnical conditions may alter the pile proving capacity

**4 ft stroke is operational stroke, 7 ft stroke should only be used for pile proving



COST SAVINGS

Berminghammer analyzed the cost saving of utilizing an EML instead of a traditional piling system over the course of a 5 week period. Largest Savings Categories were:

Less Shipping and Setup
Less Site Preparation
Reduced Personnel
Reduced Equipment Carrying Costs

\$68,300.00 SAVINGS OVER 5 WEEK



APPLICATIONS

Below are the Pile Types and Applications for the EML30

Pile Types:

H-Pile Installation
Sheet Pile Installation
Timber Pile Installation
RC Drilling
Micropiles

Foundation Types:

Industrial Building
Culvert Replacement Shoring
Rail Line Shoring
Bridge Piers / Abutments
Breakwall
Cofferdam

