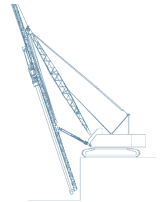




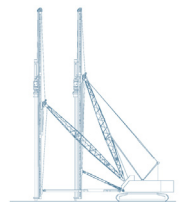
Vertical Configuration



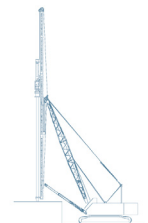
Aft Batter Below Grade



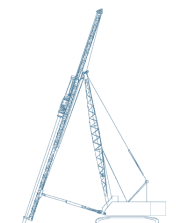
Side Batter



Forward Reach



Raised Leads Above Grade



Forward Batter

## INTRODUCTION

Located in Hamilton, Ontario, Canada, Bermingham Foundation Solutions is a manufacturer of advanced foundation equipment with over 45 years of experience. The company is represented in more than 40 countries world wide, maintains an extensive Research and Development team, and has earned a reputation for finding the most practical solutions to the most challenging projects.

The vertical travel lead, referred to as "VTL" system, was first developed and patented by C.W. Bermingham in the 1960's. This lead system was developed in response to the fundamental limitations found in a fixed lead or swinging lead systems. The fixed lead system is well suited to level job sites with few obstructions and has the advantage of fast positioning of the lead. The hanging lead is very adaptable to different elevations and batter piles but takes much longer to position. Therefore the Vertical Travel Lead was developed to combine the advantages of fixed leads, fast and accurate positioning, with the ability to adjust the height of the lead base up or down. The VTL lead is connected to the boom by a sliding connection, which allows the lead to be elevated or lowered below grade. Many have recognized the advantages of the VTL system, and they have become the Industry standard in Canada, US Railway Construction, and many parts of the USA. The structural column of the VTL will resist bending in forward, aft, and side batter positions. The hydraulic spotter is very rugged and will transmit torque to the body of the crane rather than the boom.

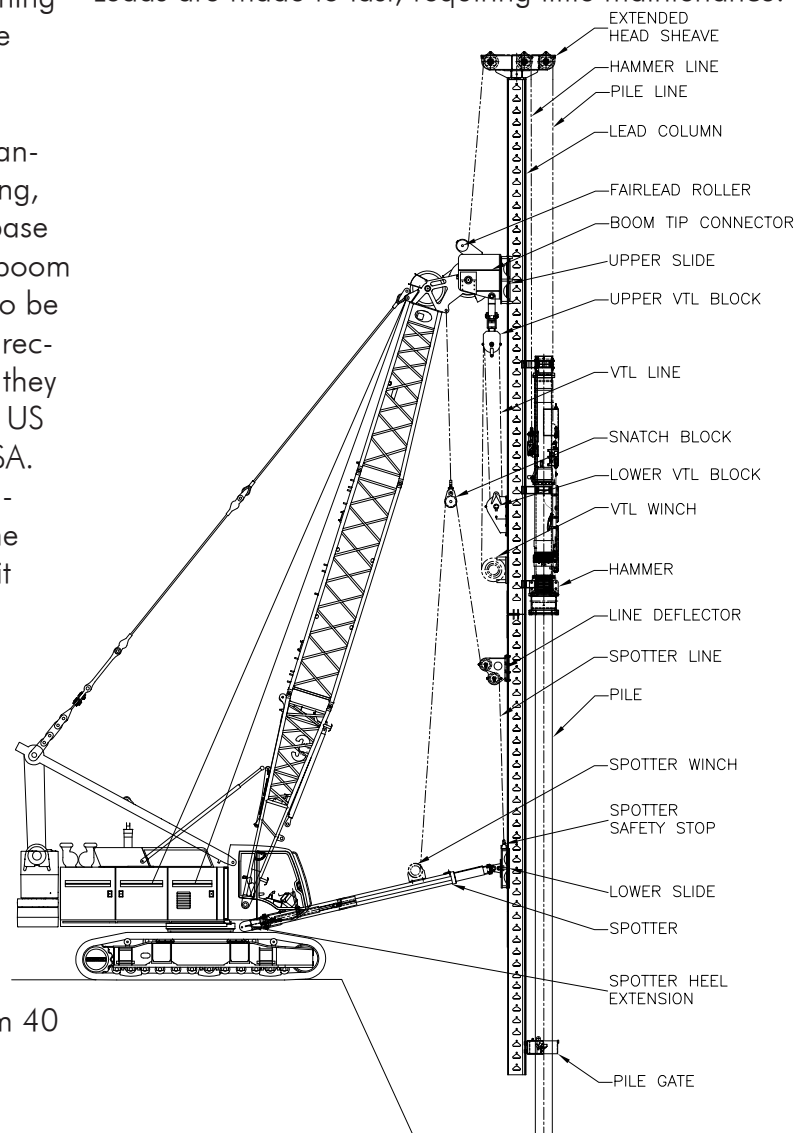
Bermingham Foundation Solutions manufactures many different models of Vertical Travel Leads and many of the first sets are still in service today.

## Well-Proven

The Bermingham Vertical Travel Lead system has been used for close to 50 years, with installations on every type of crane ranging from 40 ton truck cranes to 300+ ton crawler cranes.

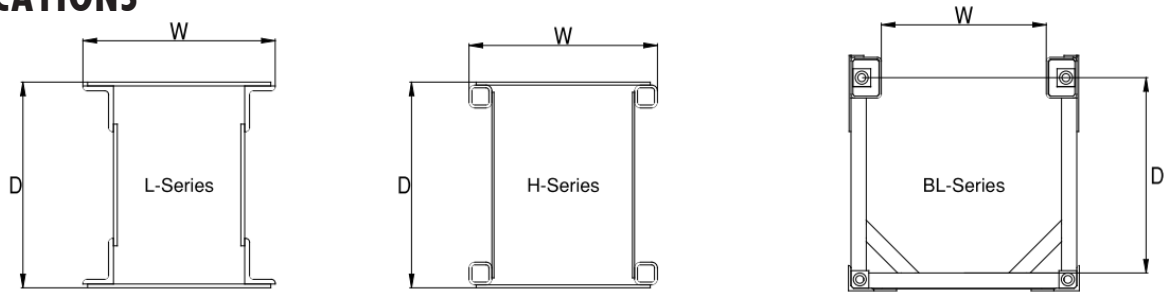
## Rugged and Simple

The Bermingham lead columns are ruggedly built to withstand the daily abuses of pile driving. The spud-type leads are available in a wide range of models for drilling and pile driving applications. The lightweight construction, combined with great strength, allow the leads to be used in any number of compound batters—up to 1:2 fore and aft and up to 1:3\* side. The leads are simple to rig and un-rig—in some cases, piles are ready for driving in less than 3 hours from arrival onsite. When rigged, the lead can be used as a jib, allowing the crane to be used to set steel, unload trucks, etc., without un-rigging the crane or using a service crane. The slim design of the lead gives the crane operator a better view for faster driving and greater on-site safety. Bermingham Vertical Travel Leads are made to last, requiring little maintenance.



\*While Bermingham lead systems are 'geometrically' capable of 'side-battering' it should only be performed when the lead and crane have been specifically designed to do so.

## LEAD SPECIFICATIONS



	SPUD LEAD				SPUD LEAD - HIGH TORQUE			BOX LEAD		
	L-15	L-18	L-23	L-27	L-23HT	L-27HT	H36	BL-26	BL-32	BL-37
Weight / Unit Length *	145 lb/ft (216 kg/m)	180 lb/ft (268 kg/m)	230 lb/ft (342 kg/m)	280 lb/ft (417 kg/m)	245 lb/ft (365 kg/m)	300 lb/ft (446 kg/m)	360 lb/ft (536 kg/m)	110 lb/ft (164 kg/m)	160 lb/ft (238 kg/m)	220 lb/ft (327 kg/m)
Width "W"	20.44" (519mm)	21.19" (538mm)	21.19" (538mm)	25.25" (641mm)	21.19" (538mm)	25.25" (641mm)	33.00" (838mm)	26.50" (673mm)	32.50" (826mm)	37.50" (953mm)
Depth "D"	15.63" (397mm)	18.75" (476mm)	23.00" (584mm)	27.00" (686mm)	23.00" (584mm)	27.00" (686mm)	36.00" (914mm)	23.00" (584mm)	38.50" (978mm)	45.00" (1143mm)
Torque Capability **	30,000 ft-lbs (40,675 Nm)	45,000 ft-lbs (61,012 Nm)	65,000 ft-lbs (88,128 Nm)	100,000 ft-lbs (135,582 Nm)	160,000 ft-lbs (216,931 Nm)	250,000 ft-lbs (338,955 Nm)	350,000 ft-lbs (474,531 Nm)	10,000 ft-lbs (13,558 Nm)	40,000 ft-lbs (54,233 Nm)	50,000 ft-lbs (67,791 Nm)

\* Typical configuration assumed, weight varies based on number of connection points.

\*\* System Torque Limits dependent on spotter attachments.

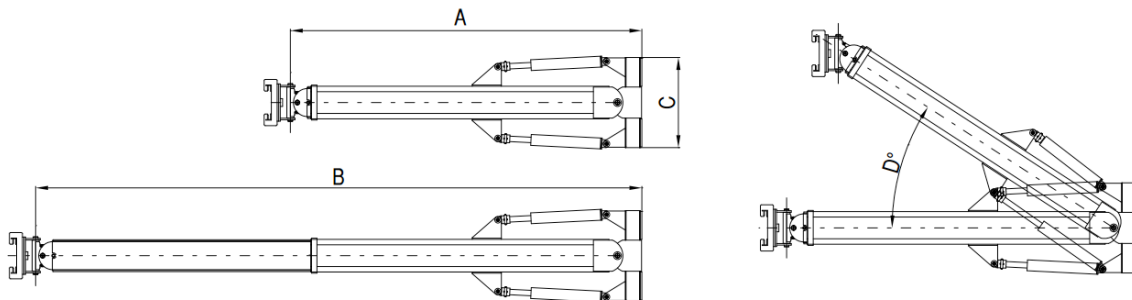
\* Lead column only.

Note: Custom leads available upon request.

## HYDRAULIC SPOTTERS

The spotter is an integral part of the Vertical Travel Leads. Birmingham spotters are capable of up to 30 degrees side-to-side movement with equalization cylinders that automatically keep the front face of the lead parallel with the front face of the crane. This is very beneficial when driving a straight bent of piles.

Precise control of the hydraulic cylinders from within the crane cab gives precise placement of piles during driving. Both 2 and 3-stage spotters provide a wide range of sizes from 12 feet (3.66 m) retracted to 56 feet (17.07 m) extended. Custom spotters are also available to suit any job.



	2-STAGE				2-STAGE HIGH TORQUE			3-STAGE		3-STAGE HEAVY DUTY	
	HHH-12	HHH-14	HHH-16	HHH-18	BK2-1218HT	BK2-1524HT	BK2-2031HT	BK3-1428	BK3-1840	BK3-1941HD	BK3-2456HD
Retracted Length "A"	14' 11" (4.55m)	16' 11" (5.16m)	18' 11" (5.77m)	20' 10" (6.35m)	12' 0" (3.66m)	15' 0" (4.57m)	20' 1" (6.12m)	13' 5" (4.09m)	17' 5" (5.31m)	18' 5" (5.61m)	23' 5" (7.14m)
Extended Length "B"	24' 8" (7.52m)	28' 8" (8.74m)	32' 7" (9.93m)	36' 7" (11.15m)	18' 0" (5.49m)	24' 0" (7.32m)	31' 6" (9.60m)	28' 2" (8.59m)	40' 2" (12.24m)	41' 2" (12.55m)	56' 2" (17.12m)
Heel Width "C"	58" (1.47m)	58" (1.47m)	58" (1.47m)	93" (2.36m)	58" (1.47m)	90" (2.29m)	97" (2.46m)	58" (1.47m)	58" (1.47m)	90" (2.29m)	90" (2.29m)
Max. Slewing Angle "D"	30°	30°	30°	30°	20° *	20° *	20° *	10°	10°	20° *	20° *
Max. Torque **	80,000 ft-lbs (108.5 kNm)	80,000 ft-lbs (108.5 kNm)	80,000 ft-lbs (108.5 kNm)	80,000 ft-lbs (108.5 kNm)	250,000 ft-lbs (339 kNm)	250,000 ft-lbs (339 kNm)	350,000 ft-lbs (474.5 kNm)	40,000 ft-lbs (54.2 kNm)	40,000 ft-lbs (54.2 kNm)	80,000 ft-lbs (108.5 kNm)	80,000 ft-lbs (108.5 kNm)
Weight	5250lb (2380kg)	5650lb (2560kg)	6100lb (2770kg)	7050lb (3200kg)	6050lb (2750kg)	7050lb (3200kg)	10500lb (4760kg)	6000lb (2720kg)	7100lb (3220kg)	10700lb (4850kg)	12950lb (5870kg)
Notes	Standard Spotter Light-to-Medium Drilling				High Torque Drilling			Larger Range of In/Out Systems with a Large Range of In/Out Batters		Large Range of In/Out Heavy Duty Frames for Drilling or On Barges with Side Loading	

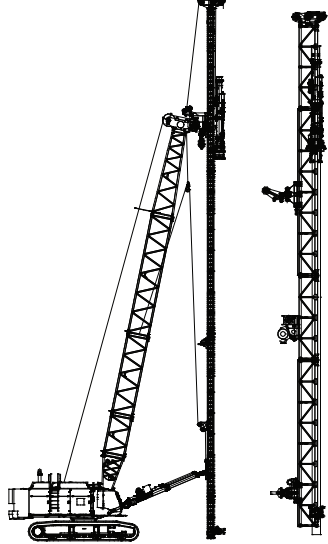
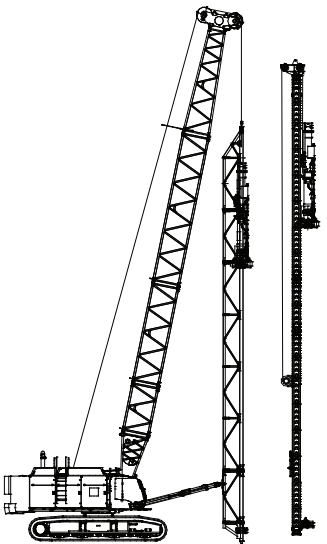
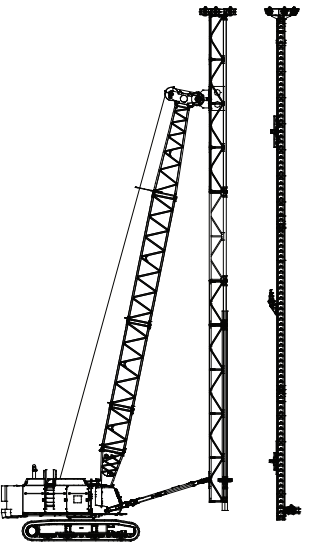
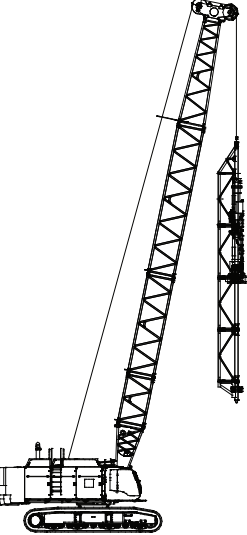
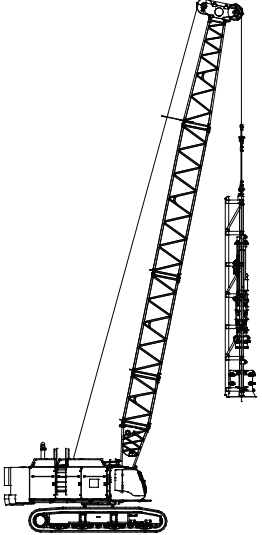
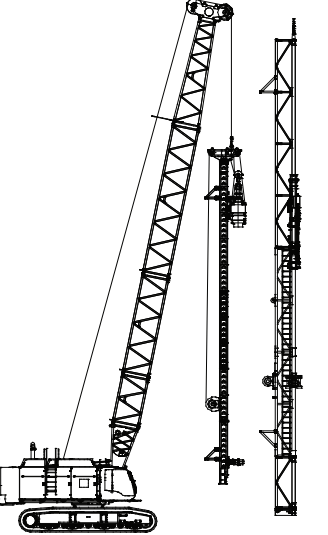
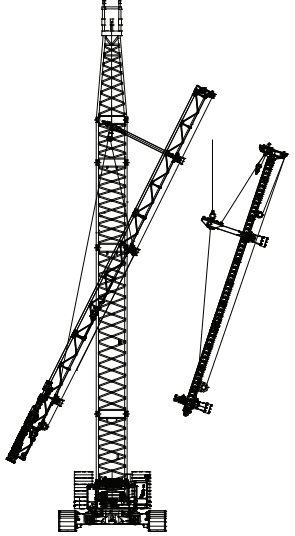
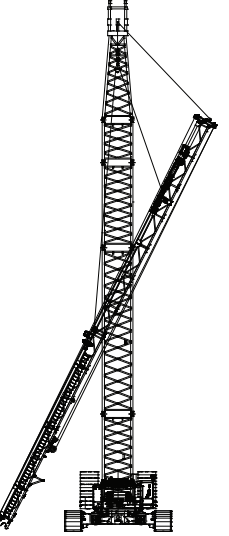
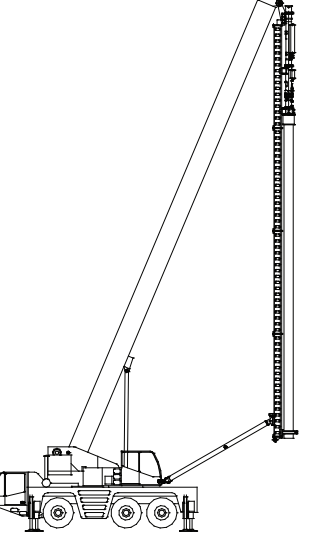
Note: Custom spotters available upon request.

\* No equalizing

\*\* To achieve maximum torque values, additional components are required.



LEAD STYLES

<p>Vertical Travel</p> 	<p>Semi-Fixed</p> 	<p>Fixed</p> 
<p>Hanging</p> 	<p>Offshore</p> 	<p>Flying</p> 
<p>Bridled</p> 	<p>Free Floating</p> 	<p>Fixed Underhung</p> 

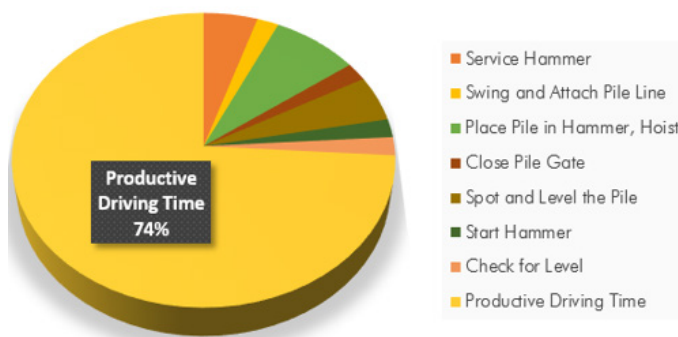
## BENEFIT

Birmingham Leads have been designed to increase the productivity of the pile driving operation. This is accomplished by minimizing the movement of the crane, and by decreasing the time spent placing the pile under the hammer and spotting of the pile.

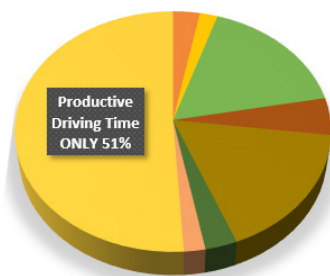
On a typical project, the actual productive driving time may be increased from an average of 50% of the work day to 75% or more.

At the "BIG DIG" Nicholson saw an increase from 5 insertions per day with a custom European piling rig to 12 insertions per day with a Birmingham Vertical Travel Lead on a Manitowoc M-250.

### Productivity of Vertical Travel Leads



### Using Hanging Leads



## SAFETY

Birmingham Foundation Solutions' lead systems are engineered to meet the requirements of the project without exceeding the limits of the crane.

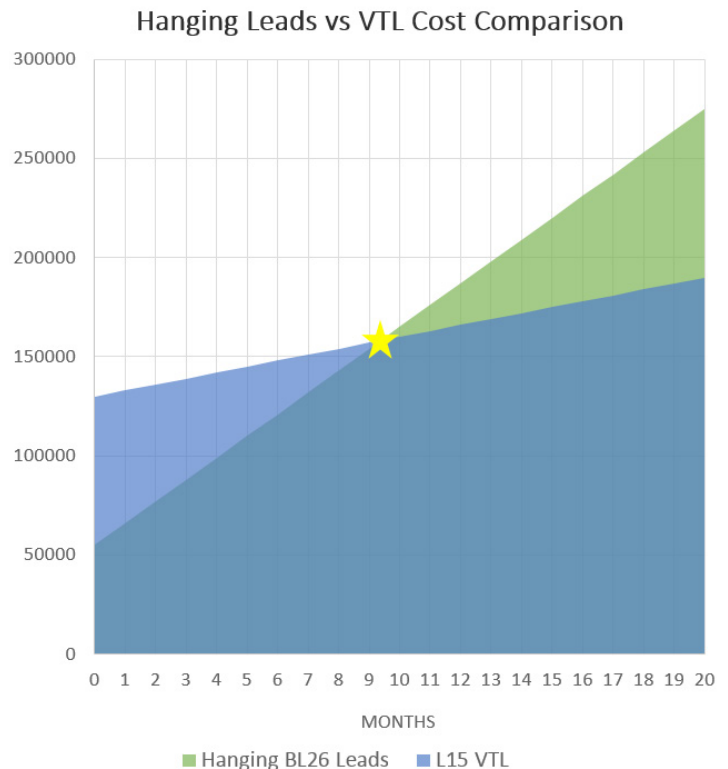
Birmingham engineers determine the safe operating limits for all custom lead systems and provide these guidelines to the customer.

As the piles are placed with the aid of the hydraulic spotter and lead, a crane operator and front end man are all that are required. The spotter (not the men) position the piles. This reduction in crew size increases site safety.

## COST BENEFIT

The daily cost of the Vertical Travel Leads is less than the daily cost of a four-man crew and swinging/hanging lead.

The VTL contractor will begin to save after nine months. An additional cost benefit will result from the increased production and reduction in false-work and templates that are no longer required.



## ACCURACY

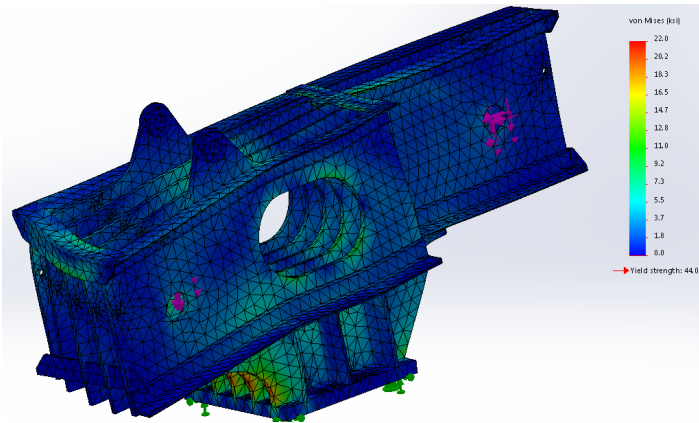
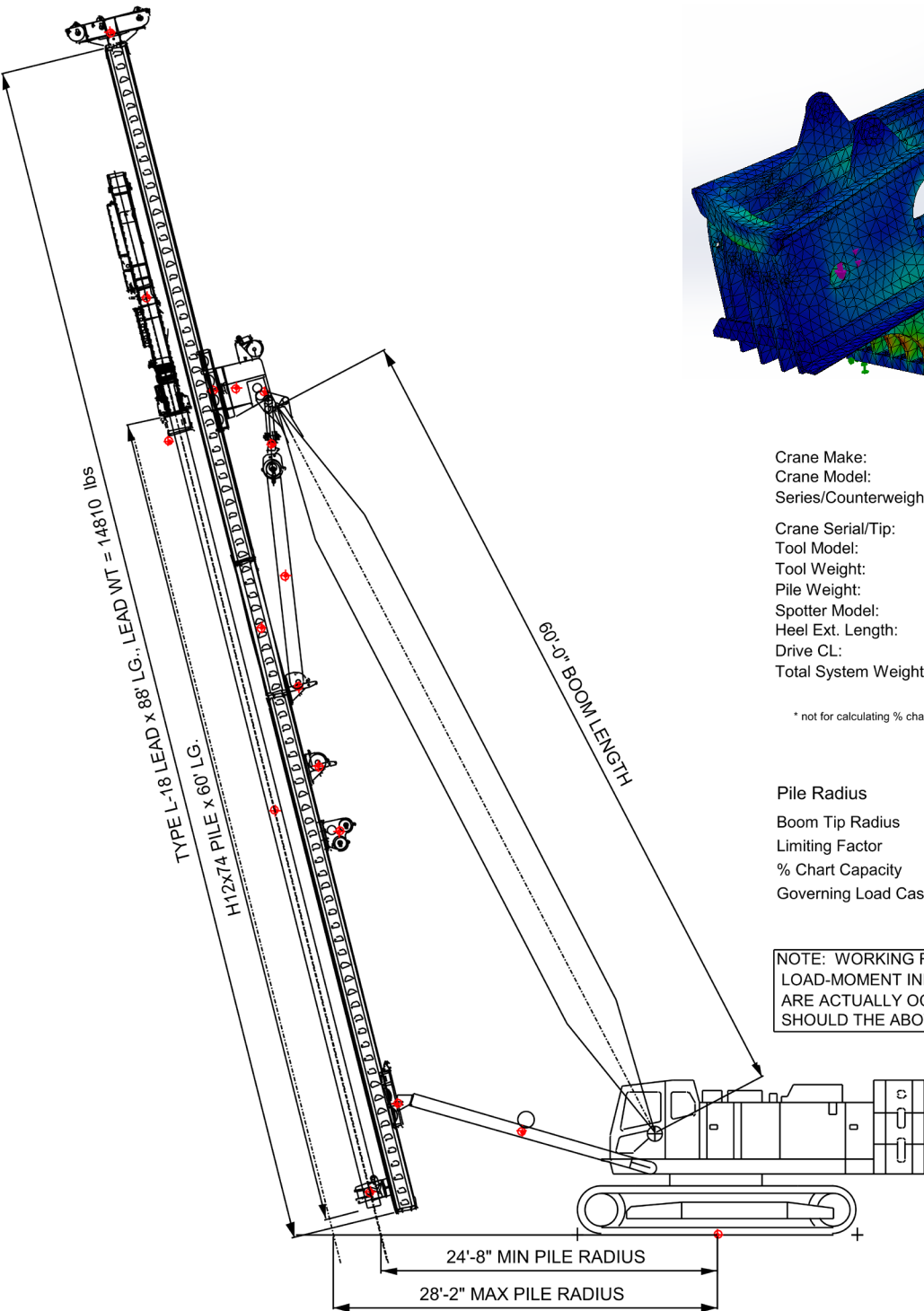
Hydraulic positioning of the lead and pile provides greater accuracy and consistency in driving piles. Batter Piles can easily be driven to tight tolerances and the Vertical Travel Lead provides improved alignment between the hammer and the pile. The Vertical Travel Lead System allows for fast and accurate positioning and alignment during splicing and re-driving of pile increasing productivity

# ENGINEERING

Birmingham employs a staff of licensed civil, geotechnical, and mechanical engineers as well as draftsmen, designers and technicians. These professionals provide the highest level of technical expertise in the design and engineering of Birmingham lead systems.

To supplement our years of experience the Birmingham engineering staff use state-of-the-art design tools such as the latest versions of CAD software including 3-D modeling and finite-element analysis.

Birmingham engineers also make use of field instrumentation and laboratory experiments to refine and optimize the design of our equipment. Measurements of strain, pressure, temperature, and load are made on a regular basis using in-house expertise and equipment. For larger instrumentation and research projects, Birmingham frequently partners with other companies and universities. In the field of foundation equipment, Birmingham’s engineering expertise is second-to-none.



Crane Make:	Link Belt
Crane Model:	LS-218HSL
Series/Counterweight:	GENERIC
Crane Serial/Tip:	GENERIC
Tool Model:	B-21
Tool Weight:	13574 lbs
Pile Weight:	4440 lbs
Spotter Model:	HHH-14
Heel Ext. Length:	17.25"
Drive CL:	18"
Total System Weight *:	51666 lbs

\* not for calculating % chart capacity

	Min	Max
Pile Radius	24'-8"	28'-2"
Boom Tip Radius	32'-3"	35'-3"
Limiting Factor	Spotter Min	Stability
% Chart Capacity	83.5	95.0
Governing Load Case:	Tool at Start of Driving Position	

NOTE: WORKING RADIUS ABOVE GOVERNS. CRANE'S LOAD-MOMENT INDICATOR MAY READ LOWER LEVELS THAN ARE ACTUALLY OCCURRING. UNDER NO CIRCUMSTANCES SHOULD THE ABOVE WORKING RADII BE EXCEEDED.





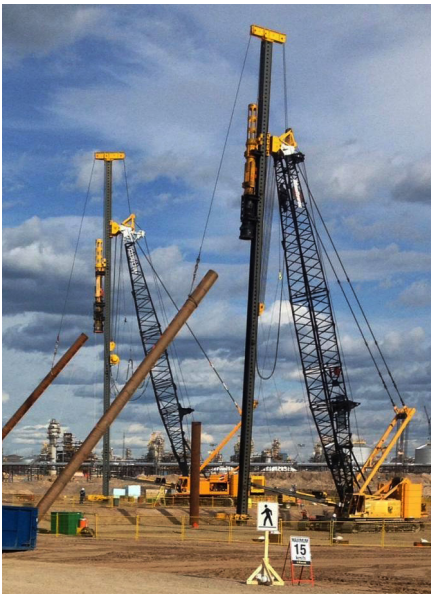
BL-37 VTL for Piling



L-27HT VTL for CFA



L-27HT VTL for Soil Mixing



L-27 VTL for Piling 36"



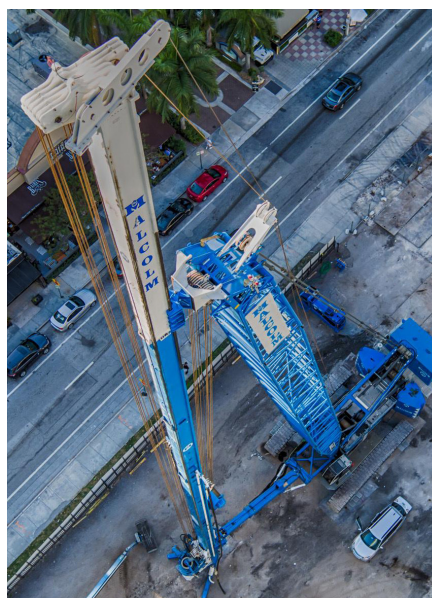
L-18 VTL for Railroad Piling



C-12M Fixed for Piling



L-23 VTL for Wick Drains



H-36 VTL for CFA 48"



L-27 VTL for Rock Socket Drilling



## ACCESSORIES AND INNOVATIONS

### Power Pack Brackets

Allows a power pack to be mounted to the rear of the crane

### Crane Hydraulic Retrofit for VTL

Utilizes existing crane hydraulics to run Bermingham VTL functions

### Stand Alone Valves (SAV)

Allows a customer to utilize an existing Vibro powerpack to run Bermingham VTL functions

### Vibro Slides

Allows for guided precise utilization of a vibratory hammer.

### Wick Drain Dispensers

controlled / tensioned release of the wick drain

### Custom Gibs / Guides for Any Tool

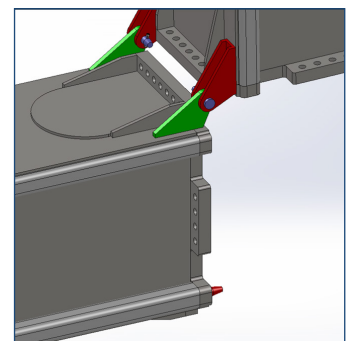
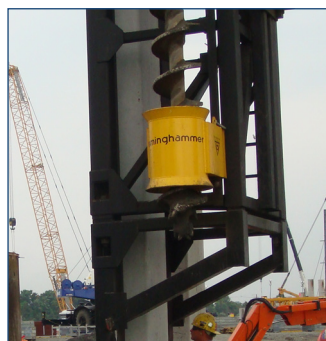
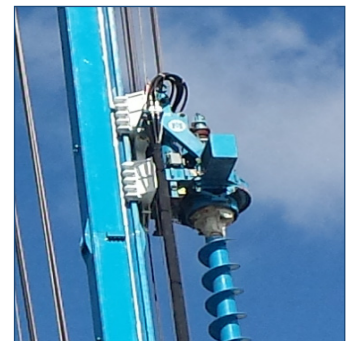
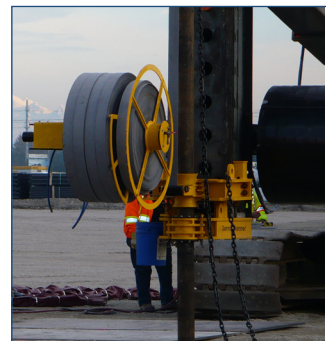
Put any tool on Bermingham Leads

### Side Mounted Augers

For pre-drilling before driving concrete piles

### Lead Rig-up Hinge

For very long lead set-ups the, the rig-up hinge design removes the need for a support crane for lofting



## HOW TO CONTACT US



Phone: 905-528-7924  
Toll Free (US & Canada): 1-800-668-9432  
Email: [bfssales@berminghammer.com](mailto:bfssales@berminghammer.com)  
Website: [www.berminghammer.com](http://www.berminghammer.com)