

Standard Power Transmission Foundations

High Quality Utility Foundations
Safe, Trusted and Manufactured in the USA

magnumpiering.com/power-transmission-industry/
800-822-7437

MAGNUM[®]
P I E R I N G
designed to support

Fabrication & Quality Control

"...these foundations undergo continuous, multi-step, quality control process including 3rd party inspections."

Magnum's Difference

The Direct Embed Pile and Utility Grillages are designed to order to ensure compatibility with any structure type or manufacturer. The steel grillages can be secured to helical piles, driven piles, drilled shaft, or micropiles. Piles that support steel grillages are smaller than single concrete caissons and require minimal crew and equipment for installation. These pile systems can be installed in congested areas with low headroom to minimize line outages. All of this means mobilization and matting costs are greatly reduced and field schedules are compressed. Rapid construction times can be as little as a single day. Add standard shipping sizes for delivery ease to limited access sites and you have an efficient and cost-effective foundation for challenging environments.

Fabrication and Quality Control

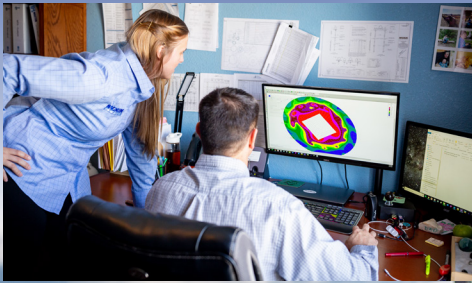
All of Magnum's Power Transmission Foundations are manufactured to order at our 90,000 square foot facility in Cincinnati, Ohio, USA. Each part of these foundations undergo a continuous, multi-step, quality control process including 3rd party inspections. With highly skilled crews of fabricators, manufacturing turnaround can meet even the tightest schedules.



**Quality,
Designs,
Constructability,
Experience,
and Safety
You Can Trust**

Engineering

Licensed in 41 states and equipped with a growing database of over 3,000 project sites, Magnum's staff of foundation engineers is able to apply its experience to assist projects throughout the United States. From support during bidding and design process to turn-key power transmission foundation designs, load testing, and field observation, they ensure quality all the way through to project completion. Trust is their goal.



MAGNUM
GEOENGINEERING

Direct Embed Pile



MAGNUM® Direct Embed Piles (MDEP) are ideal for use in soft, loose or wet soils that are difficult to create an augur hole in. After installing the MDEP into the ground the timber, steel or composite pole is placed into the bucket section and rapidly secured by PoleCrete® Stabilizer. MAGNUM® products are manufactured in the USA according to our ISO 9001 approved Quality Program. Structural capacities are developed according to AISC 360 and NESC provisions. Various coatings, custom lengths, diameters and configurations available upon request.

Design Considerations

Maximum rotation at grade = 2°

Maximum lateral deflection at grade = 2"

Embedment chart based on index soil properties

Uniform soil properties

Standard bucket diameter

Available in 1 ft increments

Accommodates various pole base diameters

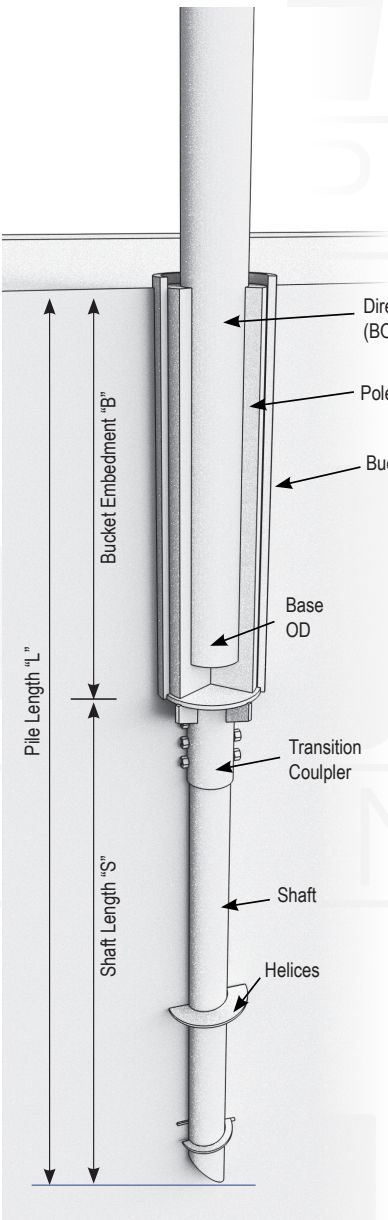


MAGNUM® Direct Embed Pile

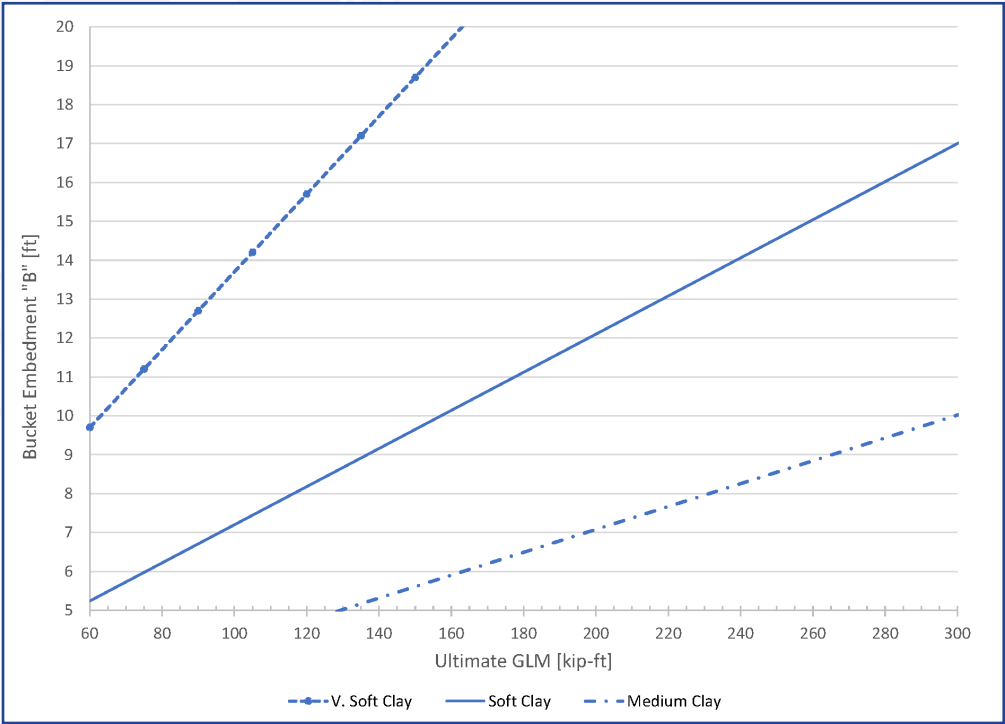
Up to 300 kip-ft Ground Line Moment

Cohesive Soil

Description: MAGNUM® Direct Embed Piles (MDEP) are manufactured in the USA according to our ISO 9001 approved Quality Program. For sites with Cohesive soils the chart and table below can be utilized to estimate the minimum bucket and shaft length of MDEP. Using the Ground Line Moment (GLM) and soil type in the graph to estimate the minimum bucket length, then add it to the shaft length from the table based on the ANSI pole classification for the total estimated length. Install MDEPs to the required depth. Hot-dip galvanized coating, custom lengths, diameters and configurations available upon request.



Shaft Length "S" [ft]			
ANSI Pole Class	Very Soft Clay	Soft Clay	Medium Clay
C1, C2 & H1	20	17	10
*H2, H3 & H4	N/A		



Index Soil Properties	Cohesive Soils		
	V. Soft	Soft	Medium
SPT Blow Count (bpf)	1-2	2-4	4-8
Strain, E_{50}	0.06	0.02	0.01
p-y Modulus (pci)	30	100	500
Cohesion (psf)	200	400	800
Friction Angle (deg)	0	0	0
Unit Weight (pcf)	80	85	90

Notes: MAGNUM® Direct Embed Piles shall be installed to the appropriate bucket embedment depth as determined by geotechnical engineer or local practice. Place and secure pole into the bucket using Polecrete® Stabilizer. Mix and place stabilizer according to manufacturer's recommendations.

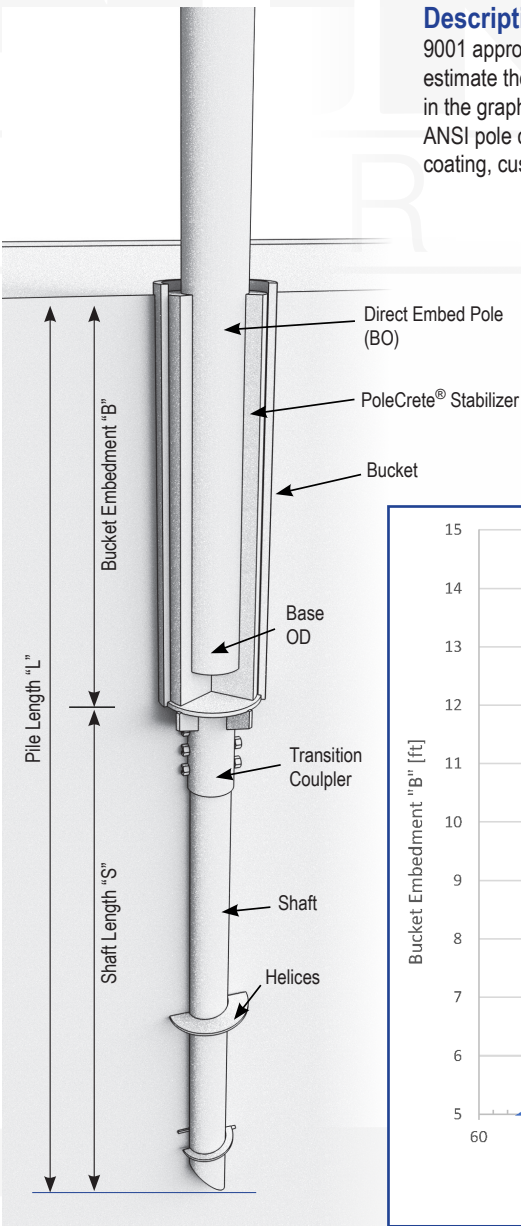


MAGNUM® Direct Embed Pole

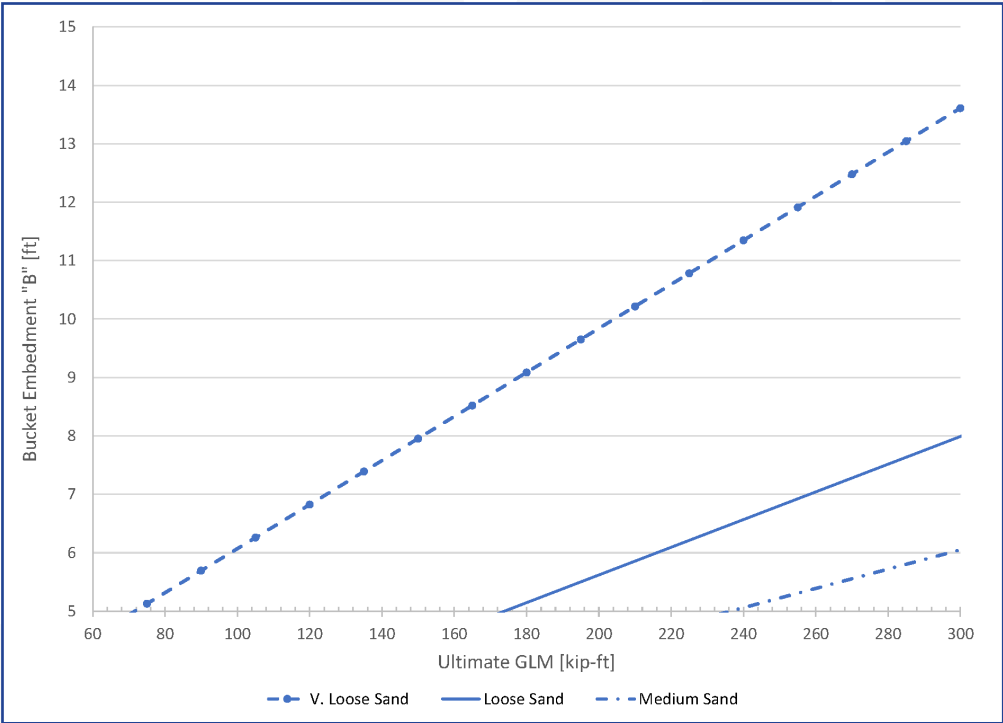
Up to 300 kip-ft Ground Line Moment

Non-Cohesive Soil

Description: MAGNUM® Direct Embed Piles (MDEP) are manufactured in the USA according to our ISO 9001 approved Quality Program. For sites with Non-Cohesive soils the chart and table below can be utilized to estimate the minimum bucket and shaft length of MDEP. Using the Ground Line Moment (GLM) and soil type in the graph to estimate the minimum bucket length, then add it to the shaft length from the table based on the ANSI pole classification for the total estimated length. Install MDEPs to the required depth. Hot-dip galvanized coating, custom lengths, diameters and configurations available upon request.



Shaft Length "S" [ft]			
ANSI Pole Class	Very Loose Sandy	Loose Sand	Medium Sand
C1, C2, H1 H2, H3 & H4	12	9	7



Index Soil Properties	Non-Cohesive Soils		
	V. Loose Sand	Loose Sand	Medium Sand
SPT Blow Count (bpf)	1-4	4-10	10-30
Strain, E ₅₀	N/A	N/A	N/A
p-y Modulus (pci)	5	25	90
Cohesion (psf)	0	0	0
Friction Angle (deg)	25	29	33
Unit Weight (pcf)	70	90	110

Notes: MAGNUM® Direct Embed Piles shall be installed to the appropriate bucket embedment depth as determined by geotechnical engineer or local practice. Place and secure pole into the bucket using Polecrete® Stabilizer. Mix and place stabilizer according to manufacturer's recommendations.



Steel Utility Grillages

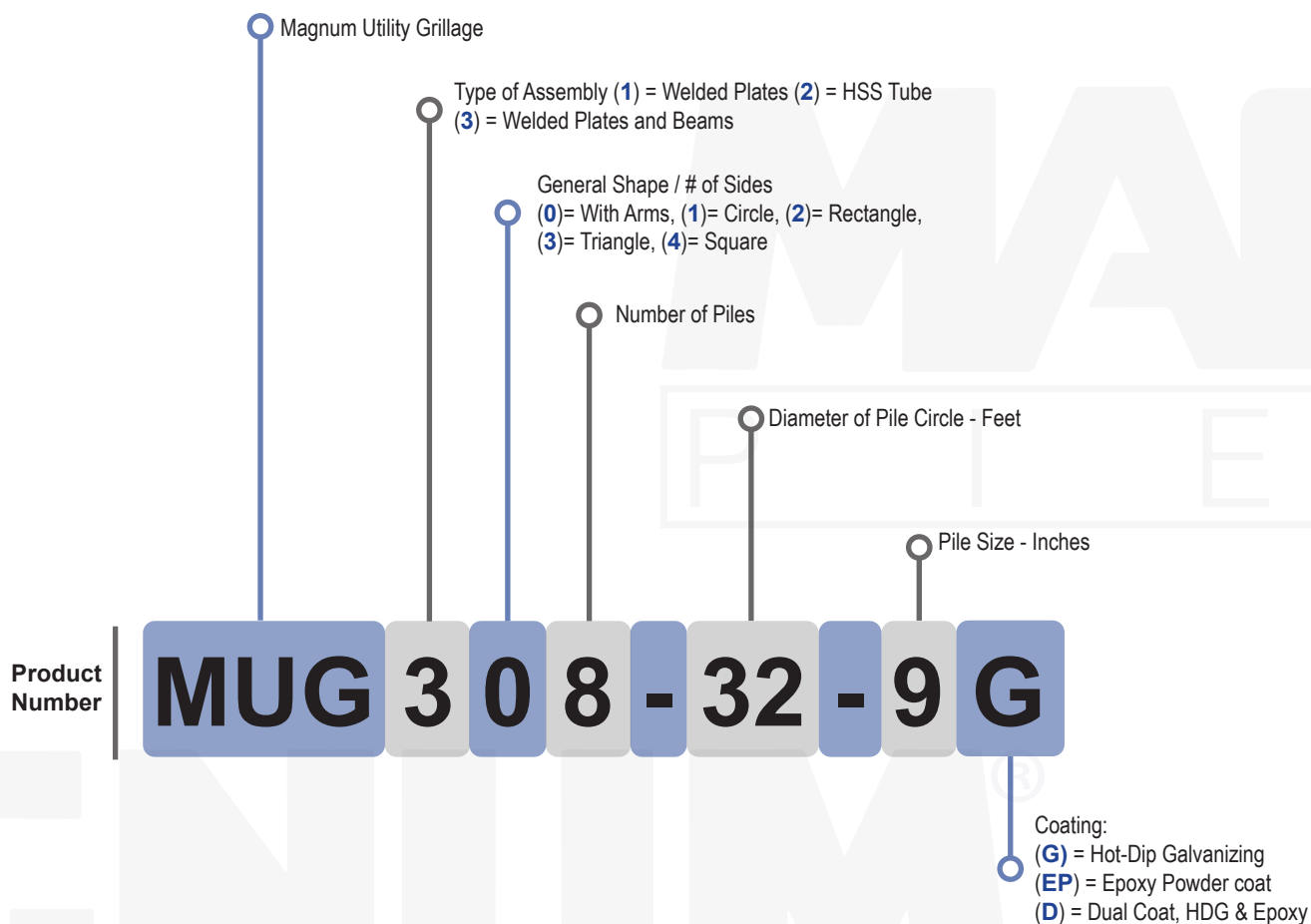
MAGNUM® Utility Grillage (MUG) systems are manufactured in the USA according to our ISO 9001 approved Quality Program. Structural capacities are developed according to AISC 360 and NESC provision. The MUG is configured to fit any structure and ground line moment and can be secured to helical piles, driven piles, drilled shaft, or micropiles. Your MUG system will be designed by our full-time staff of engineers to coordinate with your structure, pile type and site soils to ensure a high-quality foundation for your project. MUG foundation systems are available in many styles, sizes and capacities to fit the needs of your project. MUG are protected from the elements by hot-dip-galvanized, epoxy coating or a dual coat system.



Utility Grillage Number Specification Legend

Example

The Magnum Steel Grillage product number below **MUG 308-32-9 G** is for a grillage that is constructed out of a welded steel plate assembly that connects to field bolted steel arms which are founded on eight (8) piles placed in a circle that is thirty-two (32) feet in diameter, each pile is nominally a nine (9) inch diameter pile.

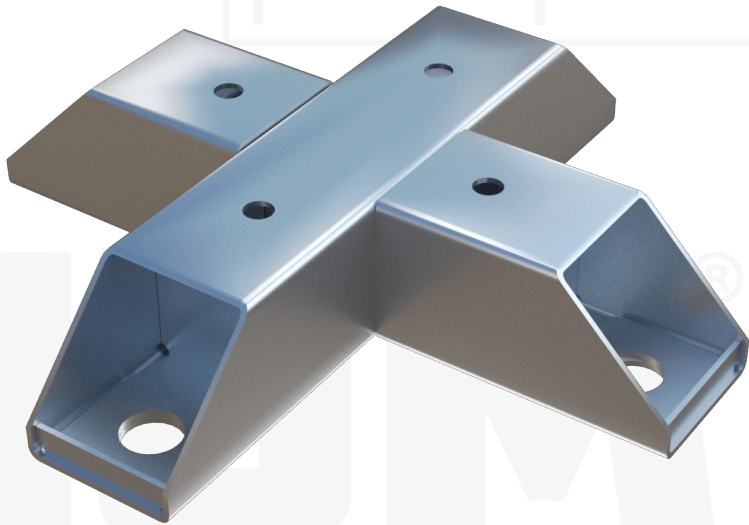


MAGNUM® MUG244-4 Utility Grillage

150 Kip-Ft Grount Line Moment

4-Pile Steel Grillage Foundation System

Description: MAGNUM® MUG244-4 Utility Grillage (MUG) has a factored groundline moment capacity of 150 kip-ft. MUGs are made to order in the USA following our ISO 9001 certified quality program. Grillage central mounting plates are configured to coordinate with project specific pole base plates while the grillage beams span to a symmetric pile group. Patented clamp-style caps allow MAGNUM® helical piles to directly support the MUG providing an all-steel foundation solution for remote or demanding site locations.



Approximate Service Level Tower Reactions	
Moment (kip-ft)	150
Vertical (kip)	10
Properties	
Number of Piles	4
Pile Circle	4 ft

Example Helical Piles for Varying GLM:

Helical Pile Type	Ground Line Moment (k-ft)	Pile Axial (kip)	Pile Shear (kip)
MH429	150	38	1.9
MH3530	100	25	1.3
MH325	50	13	0.7

Installation Notes: After Installation of MAGNUM® helical piles, cut off excess pile shafts to the desired elevation then install MAGNUM® MHC1304 pile end caps on each pile. Install the MUG on top of the end caps and connect to the piles using provided threadbar and washer plates. MUG connection detail allows up to 3" pile location tolerance to accommodate typical pile installations. After MUG is fastened in place, directly mount the structure onto the central mounting plate and secure in place

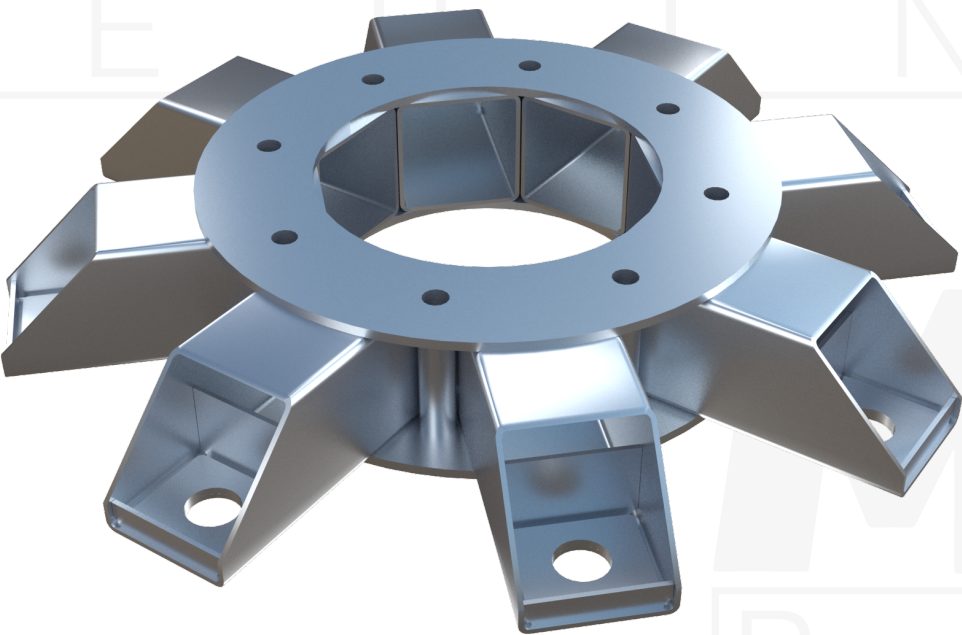


MAGNUM® MUG208-7 Utility Grillage

1,500 Kip-Ft Ground Line Moment

8-Pile Steel Grillage Foundation System

Description: MAGNUM® MUG208-7 Utility Grillage (MUG) has a factored groundline moment capacity of 1,500 kip-ft. MUGs are made to order in the USA following our ISO 9001 certified quality program. Grillage central mounting plates are configured to coordinate with project specific pole base plates while the grillage beams span to a symmetric pile group. Patented clamp-style caps allow MAGNUM® helical piles to directly support the MUG providing an all-steel foundation solution for remote or demanding site locations.

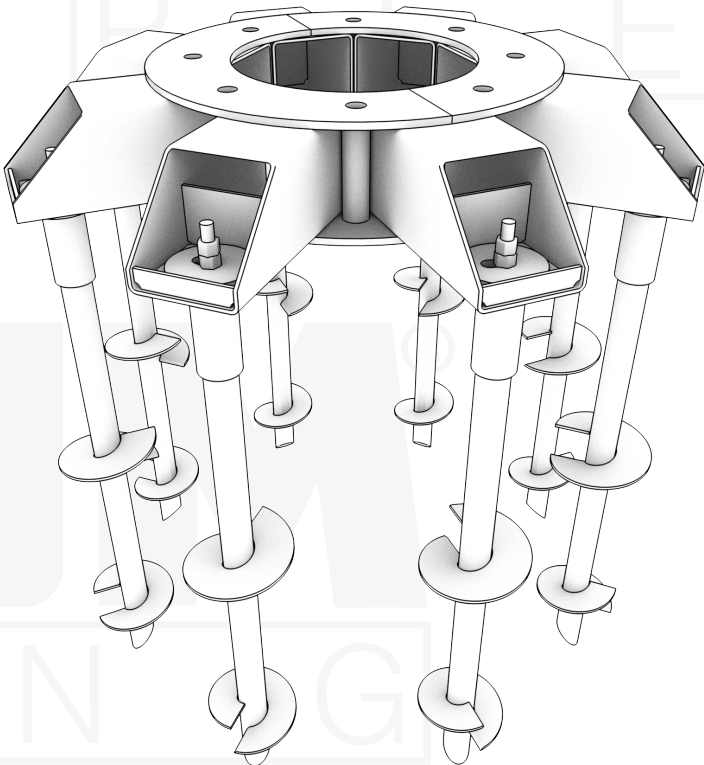


Approximate Service Level Tower Reactions	
Moment (kip-ft)	1,500
Vertical (kip)	15
Properties	
Number of Piles	8
Pile Circle	7.33 ft

Example Helical Piles for Varying GLM:

Helical Pile Type	Ground Line Moment (k-ft)	Pile Axial (kip)	Pile Shear (kip)
MH736	1,500	110	5.5
MH530	1,000	70	3.5
MH429	500	35	1.8

Installation Notes: After Installation of MAGNUM® helical piles, cut off excess pile shafts to the desired elevation then install MAGNUM® MHC1304 pile end caps on each pile. Install the MUG on top of the end caps and connect to the piles using provided threadbar and washer plates. MUG connection detail allows up to 3" pile location tolerance to accommodate typical pile installations. After MUG is fastened in place, directly mount the structure onto the central mounting plate and secure in place.

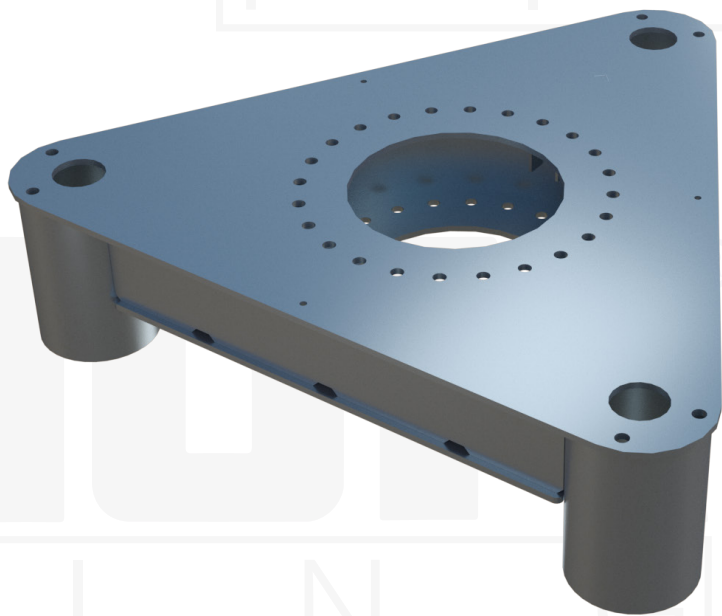


MAGNUM® MUG133-7 Utility Grillage

2,100 Kip-Ft Ground Line Moment

3-Pile Steel Grillage Foundation System

Description: MAGNUM® MUG133-7 Utility Grillage (MUG) has a factored groundline moment capacity of 2,100 kip-ft. MUGs are made to order in the USA following our ISO 9001 certified quality program. Grillage central mounting plates are configured to coordinate with project specific pole base plates while the grillage beams span to a symmetric pile group. Patented clamp-style caps allow MAGNUM® helical piles to directly support the MUG providing an all-steel foundation solution for remote or demanding site locations.

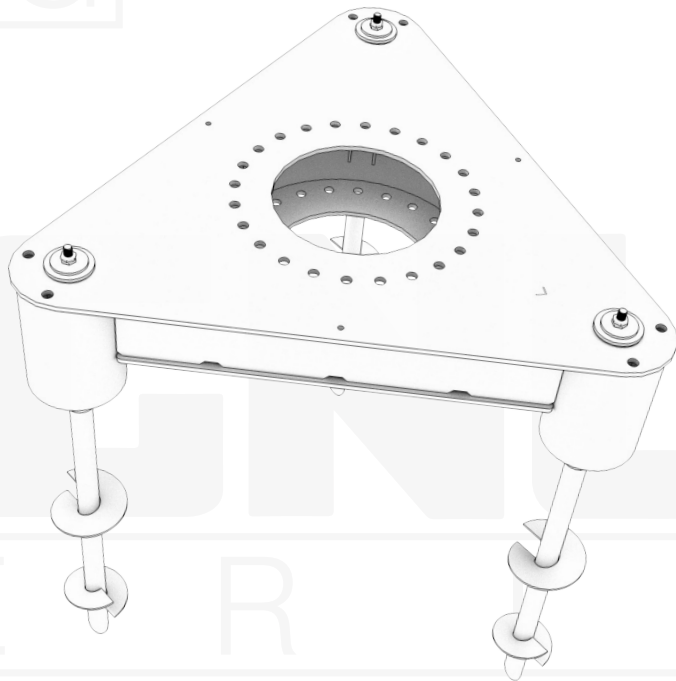


Approximate Service Level Tower Reactions	
Moment (kip-ft)	2,100
Vertical (kip)	190
Properties	
Number of Piles	3
Pile Circle	7 ft

Example Helical Piles for Varying GLM:

Helical Pile Type	Ground Line Moment (k-ft)	Pile Axial (kip)	Pile Shear (kip)
MH1338	2,100	360	18
MH939	1,400	267	13.4
MH736	700	134	6.7

Installation Notes: After Installation of MAGNUM® helical piles, cut off excess pile shafts to the desired elevation then install MAGNUM® MHC1304 pile end caps on each pile. Install the MUG on top of the end caps and connect to the piles using provided threadbar and washer plates. MUG connection detail allows up to 3" pile location tolerance to accommodate typical pile installations. After MUG is fastened in place, directly mount the structure onto the central mounting plate and secure in place.

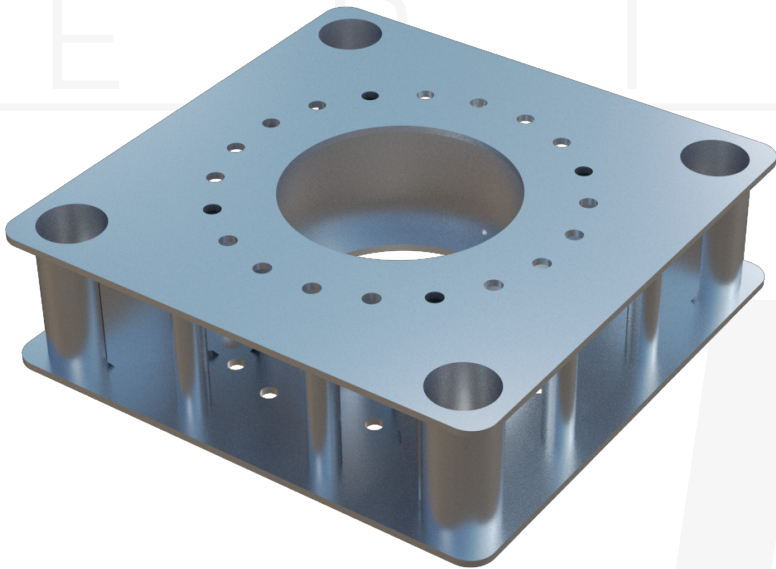


MAGNUM® MUG144-8 Utility Grillage

3,000 Kip-Ft Ground Line Moment

4-Pile Steel Grillage Foundation System

Description: MAGNUM® MUG144-8 Utility Grillage (MUG) has a factored groundline moment capacity of 3,000 kip-ft. MUGs are made to order in the USA following our ISO 9001 certified quality program. Grillage central mounting plates are configured to coordinate with project specific pole base plates while the grillage beams span to a symmetric pile group. Patented clamp-style caps allow MAGNUM® helical piles to directly support the MUG providing an all-steel foundation solution for remote or demanding site locations.

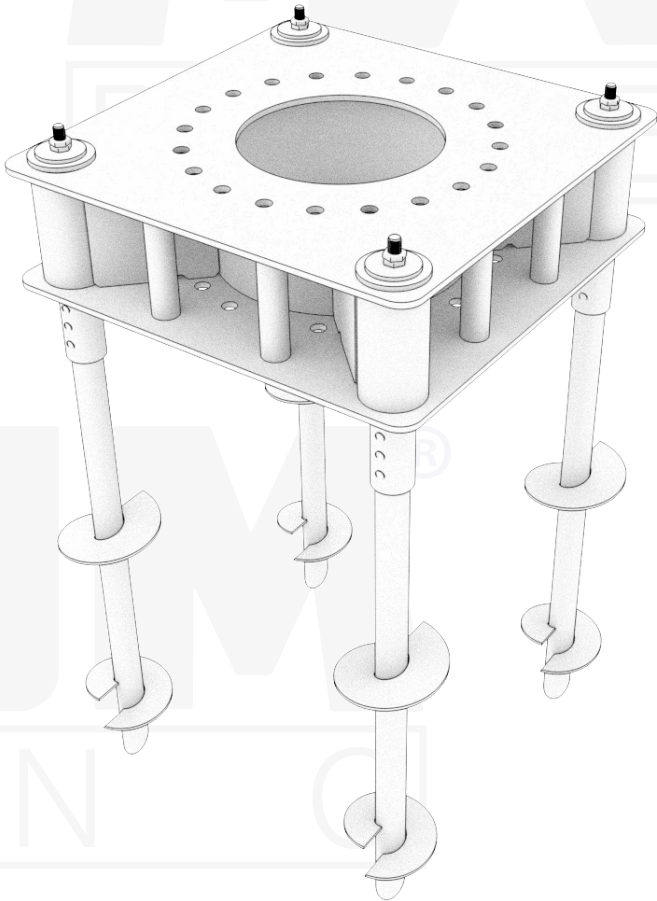


Approximate Service Level Tower Reactions	
Moment (kip-ft)	3,000
Vertical (kip)	160
Properties	
Number of Piles	4
Pile Circle	8 ft

Example Helical Piles for Varying GLM:

Helical Pile Type	Ground Line Moment (k-ft)	Pile Axial (kip)	Pile Shear (kip)
MH1338	3,000	375	18.8
MH939	2,000	250	12.5
MH530	1,000	125	6.3

Installation Notes: After Installation of MAGNUM® helical piles, cut off excess pile shafts to the desired elevation then install MAGNUM® MHC1304 pile end caps on each pile. Install the MUG on top of the end caps and connect to the piles using provided threadbar and washer plates. MUG connection detail allows up to 3" pile location tolerance to accommodate typical pile installations. After MUG is fastened in place, directly mount the structure onto the central mounting plate and secure in place.

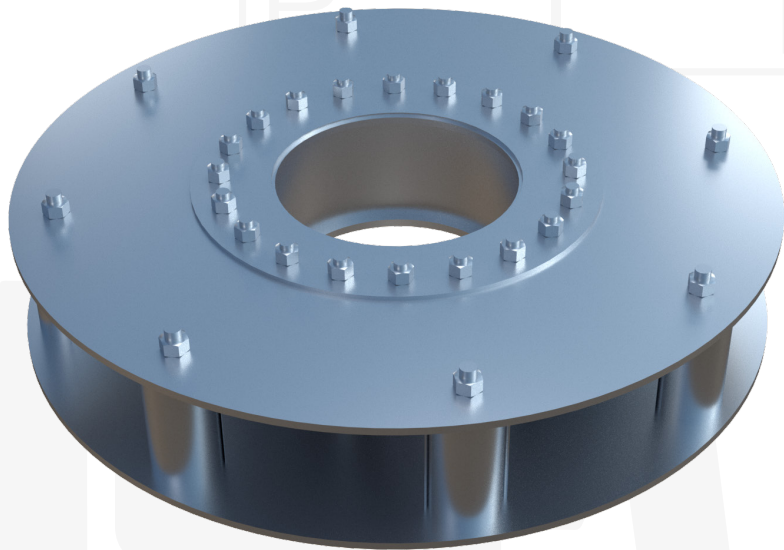


MAGNUM® MUG118-10 Utility Grillage

5,300 Kip-Ft Ground Line Moment

8-Pile Steel Grillage Foundation System

Description: MAGNUM® MUG118-10 Utility Grillage (MUG) has a factored groundline moment capacity of 5,300 kip-ft. MUGs are made to order in the USA following our ISO 9001 certified quality program. Grillage central mounting plates are configured to coordinate with project specific pole base plates while the grillage beams span to a symmetric pile group. Patented clamp-style caps allow MAGNUM® helical piles to directly support the MUG providing an all-steel foundation solution for remote or demanding site locations.

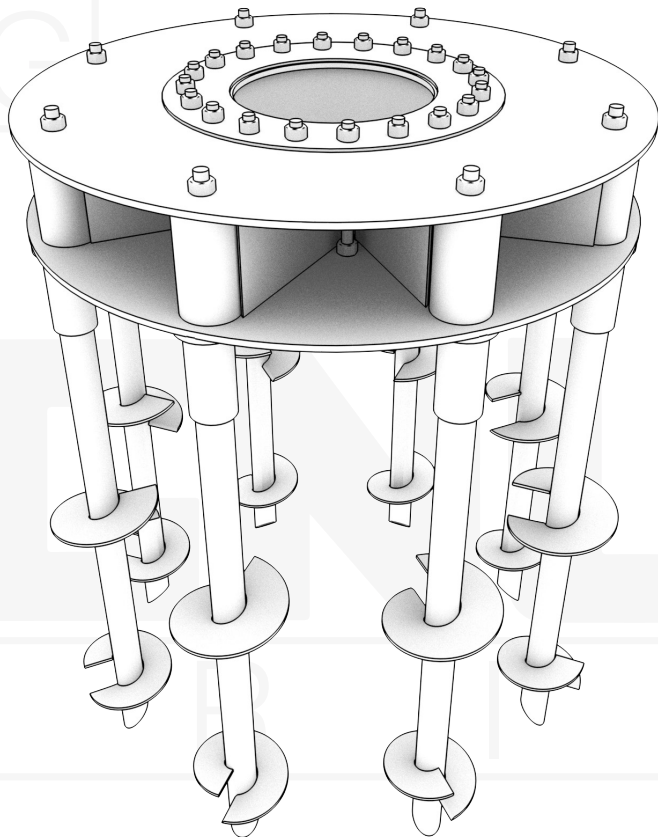


Approximate Service Level Tower Reactions	
Moment (kip-ft)	5,300
Vertical (kip)	60
Properties	
Number of Piles	8
Pile Circle	9.5 ft

Example Helical Piles for Varying GLM:

Helical Pile Type	Ground Line Moment (k-ft)	Pile Axial (kip)	Pile Shear (kip)
MH939	5,300	315	8
MH736	3,533.3	186	6
MH530	1,766.7	93	4

Installation Notes: After Installation of MAGNUM® helical piles, cut off excess pile shafts to the desired elevation then install MAGNUM® MHC1304 pile end caps on each pile. Install the MUG on top of the end caps and connect to the piles using provided threadbar and washer plates. MUG connection detail allows up to 3" pile location tolerance to accommodate typical pile installations. After MUG is fastened in place, directly mount the structure onto the central mounting plate and secure in place.

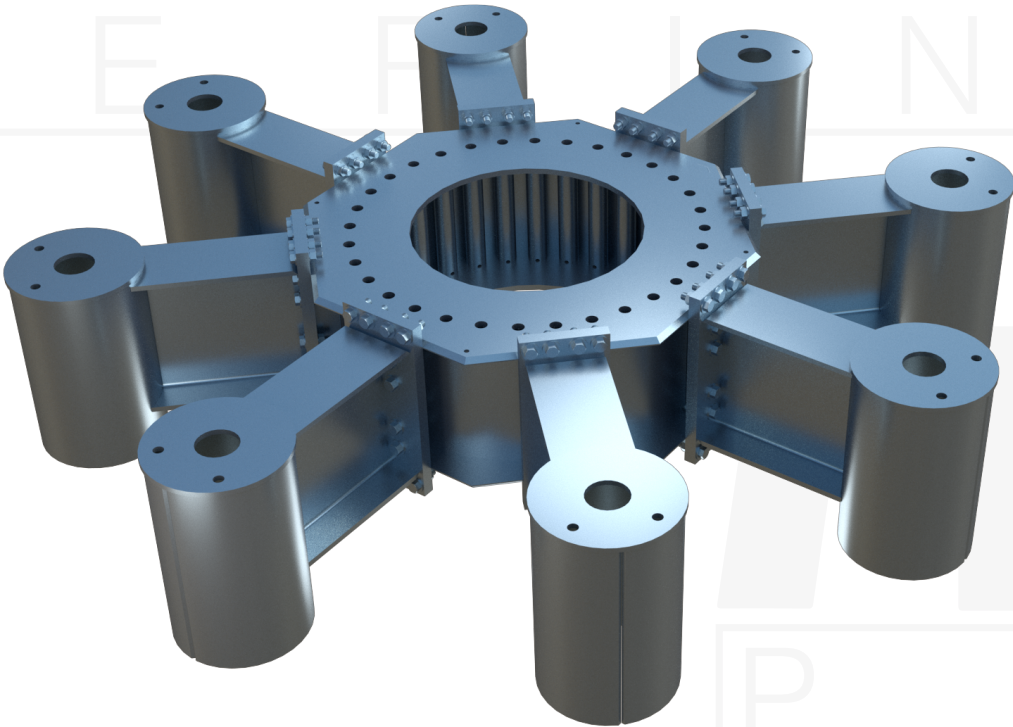


MAGNUM® MUG308-19 Utility Grillage

15,750 Kip-Ft Ground Line Moment

8-Pile Steel Grillage Assembly

Description: MAGNUM® MUG308-19 Utility Grillage (MUG) has a factored groundline moment capacity of 15,750 kip-ft. MUGs are made to order in the USA following our ISO 9001 certified quality program. Grillage central mounting plates are configured to coordinate with project specific pole base plates while the grillage beams span to a symmetric pile group. Patented clamp-style caps allow MAGNUM® helical piles to directly support the MUG providing an all-steel foundation solution for remote or demanding site locations.

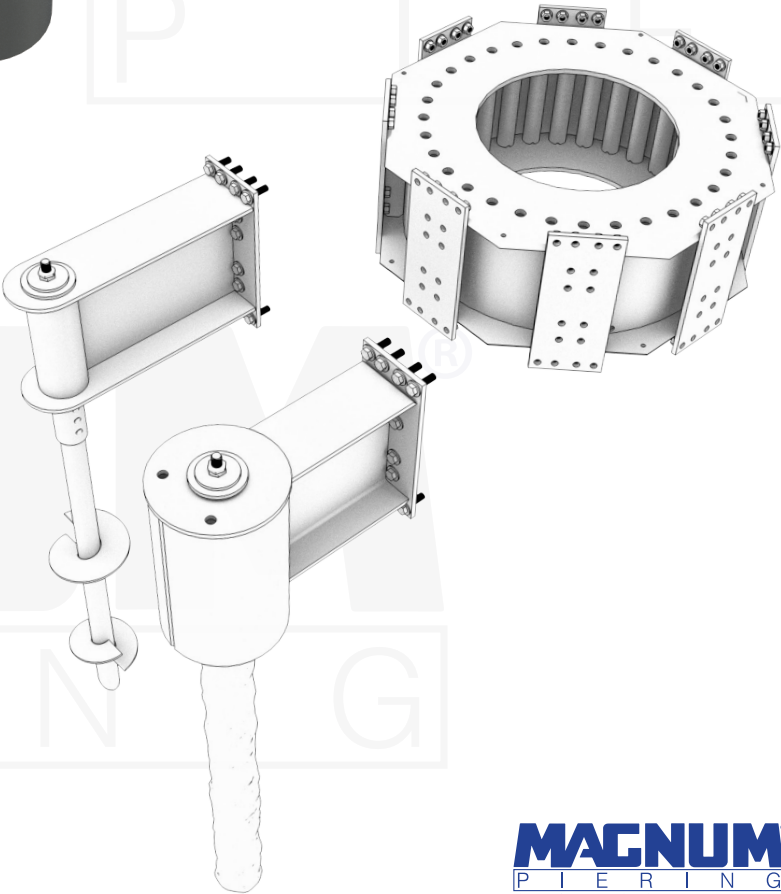


Approximate Service Level Tower Reactions	
Moment (kip-ft)	15,750
Vertical (kip)	220
Properties	
Number of Piles	8
Pile Circle	18.5 ft

Example Helical Piles for Varying GLM:

Helical Pile Type	Ground Line Moment (k-ft)	Pile Axial (kip)	Pile Shear (kip)
MH1338	15,750	430	12.9
MH939	10,500	284	8.5
MH736	5,250	142	4.3

Installation Notes: After Installation of MAGNUM® helical piles, cut off excess pile shafts to the desired elevation then install MAGNUM® MHC1304 pile end caps on each pile. Install the MUG on top of the end caps and connect to the piles using provided threadbar and washer plates. MUG connection detail allows up to 3" pile location tolerance to accommodate typical pile installations. After MUG is fastened in place, directly mount the structure onto the central mounting plate and secure in place.

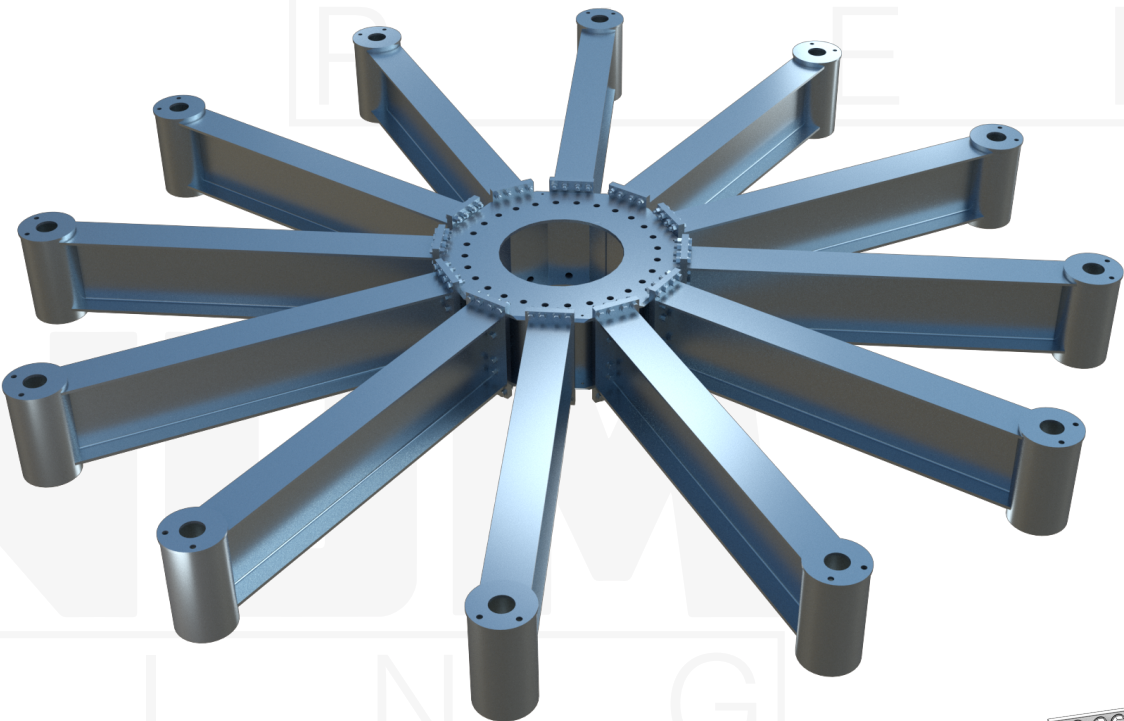


MAGNUM® MUG3012-26 Utility Grillage

19,000 Kip-Ft Ground Line Moment

12-Pile Steel Grillage Assembly

Description: MAGNUM® MUG3012-26 Utility Grillage (MUG) has a factored groundline moment capacity of 19,000 kip-ft. MUGs are made to order in the USA following our ISO 9001 certified quality program. Grillage central mounting plates are configured to coordinate with project specific pole base plates while the grillage beams span to a symmetric pile group. Patented clamp-style caps allow MAGNUM® helical piles to directly support the MUG providing an all-steel foundation solution for remote or demanding site locations.

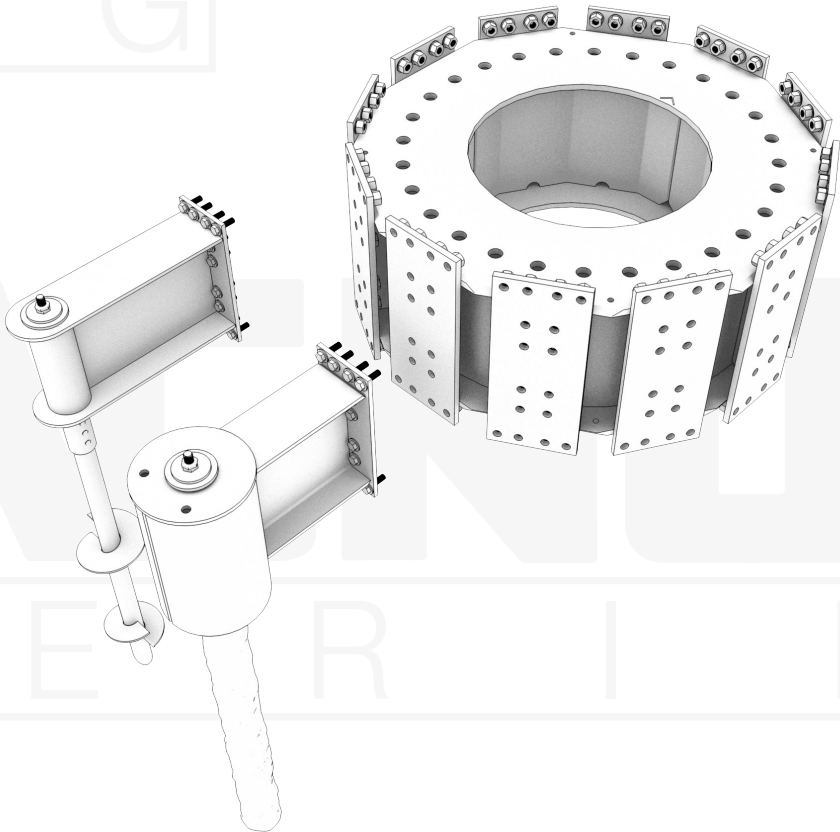


Approximate Service Level Tower Reactions	
Moment (kip-ft)	19,000
Vertical (kip)	230
Properties	
Number of Piles	12
Pile Circle	26 ft

Example Helical Piles for Varying GLM:

Helical Pile Type	Ground Line Moment (k-ft)	Pile Axial (kip)	Pile Shear (kip)
MH939	19,000	244	7.3
MH736	12,666.7	163	4.9
MH530	6,333.3	82	2.5

Installation Notes: After Installation of MAGNUM® helical piles, cut off excess pile shafts to the desired elevation then install MAGNUM® MHC1304 pile end caps on each pile. Install the MUG on top of the end caps and connect to the piles using provided threadbar and washer plates. MUG connection detail allows up to 3" pile location tolerance to accommodate typical pile installations. After MUG is fastened in place, directly mount the structure onto the central mounting plate and secure in place.



All Magnum Products Made in U.S.A.
U.S. Patents 9365998, 6058662 and 5234287; Other Patents Pending.

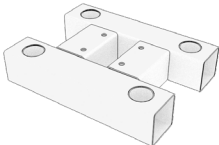
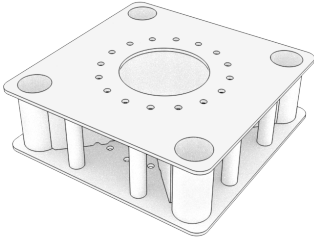
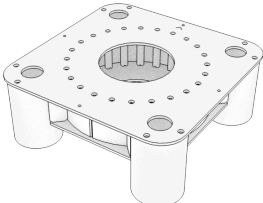
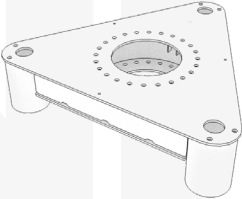
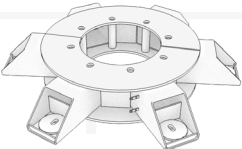
Tangent, Angle, and Dead-End Structures

All of Magnum's Power Transmission Foundations can be designed to meet specifications for a multitude of tower designs, for example:

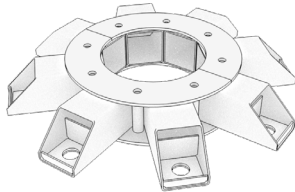
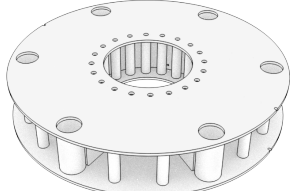
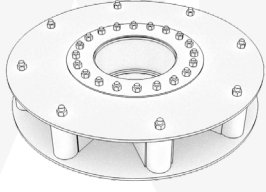
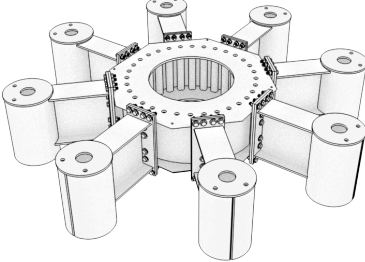
- **Lattice Towers**
- **Monopole Towers**
- **H-Frames**
- **A-Frames**
- **Timber Poles**
- **Steel Poles**
- **Guyed Towers**
- **Self-Supporting Towers**



Magnum® Utility Grillage Specifications

MAGNUM Utility Grillage	NESC Structure Ground Line Reactionss		Pile Circle (ft)	Axial Pile Capacity (kip)	Surface Coating	Schematic
	Moment (kip-ft)	Vertical (kip)				
MUG224-7-4	40	2	6.7	30	G, EP, D	
MUG244-4-4	150	10	4	38	G, EP, D	
MUG244-6-7	475	170	5.5	100	G, EP, D	
MUG144-5-5	440	10	4.67	90	G, EP, D	
MUG144-5-9	700	130	5.33	135	G, EP, D	
MUG144-7-9	800	190	6.67	135	G, EP, D	
MUG144-7-7	900	25	6.67	115	G, EP, D	
MUG144-7-9	1,100	25	6.67	140	G, EP, D	
MUG144-6-5	2,600	150	6	335	G, EP, D	
MUG144-8-5	3,000	160	8	315	G, EP, D	
MUG144-10-9	5,500	75	10	445	G, EP, D	
MUG133-8-9	900	20	7.5	140	G, EP, D	
MUG133-6-5	1,025	10	5.5	125	G, EP, D	
MUG133-8-5	1,450	15	7.5	125	G, EP, D	
MUG133-7-5	2,100	190	7	360	G, EP, D	
MUG206-7-7	1,025	275	7.33	140	G, EP, D	
MUG206-8-9	2,600	200	7.5	330	G, EP, D	

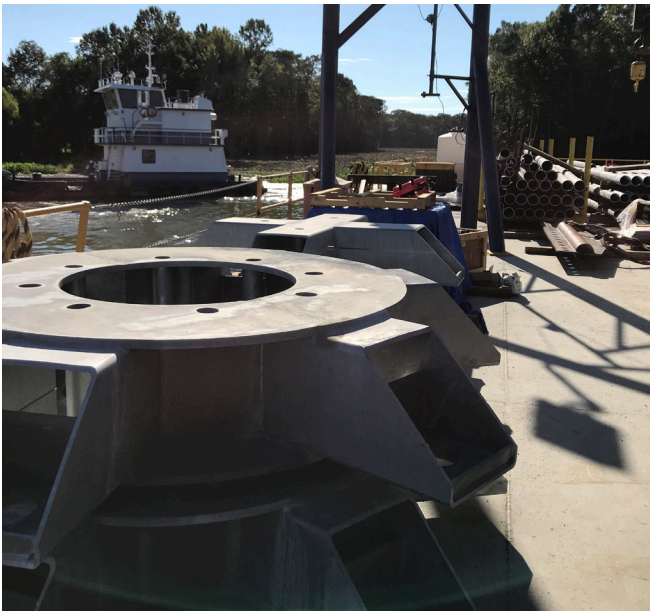
Magnum® Utility Grillage Specifications (Continued)

MAGNUM Utility Grillage	NESC Structure Ground Line Reactions		Pile Circle (ft)	Axial Pile Capacity (kip)	Surface Coating	Schematic
	Moment (kip-ft)	Vertical (kip)				
MUG208-7-7	1,500	15	7.33	110	G, EP, D	
MUG208-9-9	3,700	375	9	375	G, EP, D	
MUG116-8-7	1,050	185	8.33	125	G, EP, D	
MUG116-8-9	1,100	285	8.33	150	G, EP, D	
MUG116-10-9	3,300	20	9.5	230	G, EP, D	
MUG118-8-9	2,300	60	8.33	165	G, EP, D	
MUG118-10-9	5,300	60	9.5	230	G, EP, D	
MUG308-12-9	4,000	70	12	150	G, EP, D	
MUG308-17-9	6,250	20	17	175	G, EP, D	
MUG308-15-9	10,500	200	15	390	G, EP, D	
MUG308-19-9	15,750	220	18.5	470	G, EP, D	
MUG3012-32-9	10,800	125	32	115	G, EP, D	
MUG3012-26-9	19,000	230	26	270	G, EP, D	





















Official Buy American Act Certificate

ATTENTION: Engineers, Architects, Building Officials, and Inspectors

SUBJECT: U.S.A Manufacturing

All Magnum Piering, Inc. products are manufactured in the United States. The raw materials used to produce our products are manufactured in various United States Steel Mills. All materials meet all provisions of the Buy American Act.

If you have any questions or need any further information, please do not hesitate to contact me.

Thank you,

A handwritten signature in black ink, appearing to read "Todd Paddock", with a stylized flourish at the end.

Todd Paddock
Vice President Manufacturing
Cell 513-617-6304
Office 513-759-3348 ext. 237
tpaddock@magnumpiering.comm

MAGNUM Piering Inc.
156 Circle Freeway Drive
Cincinnati Ohio, 45246

www.magnumpiering.com
800-822-7437

Copyright (C) 2024 All Rights Reserved



For more information or to talk with a representative:
800-822-7437 | www.magnumpiercing.com

