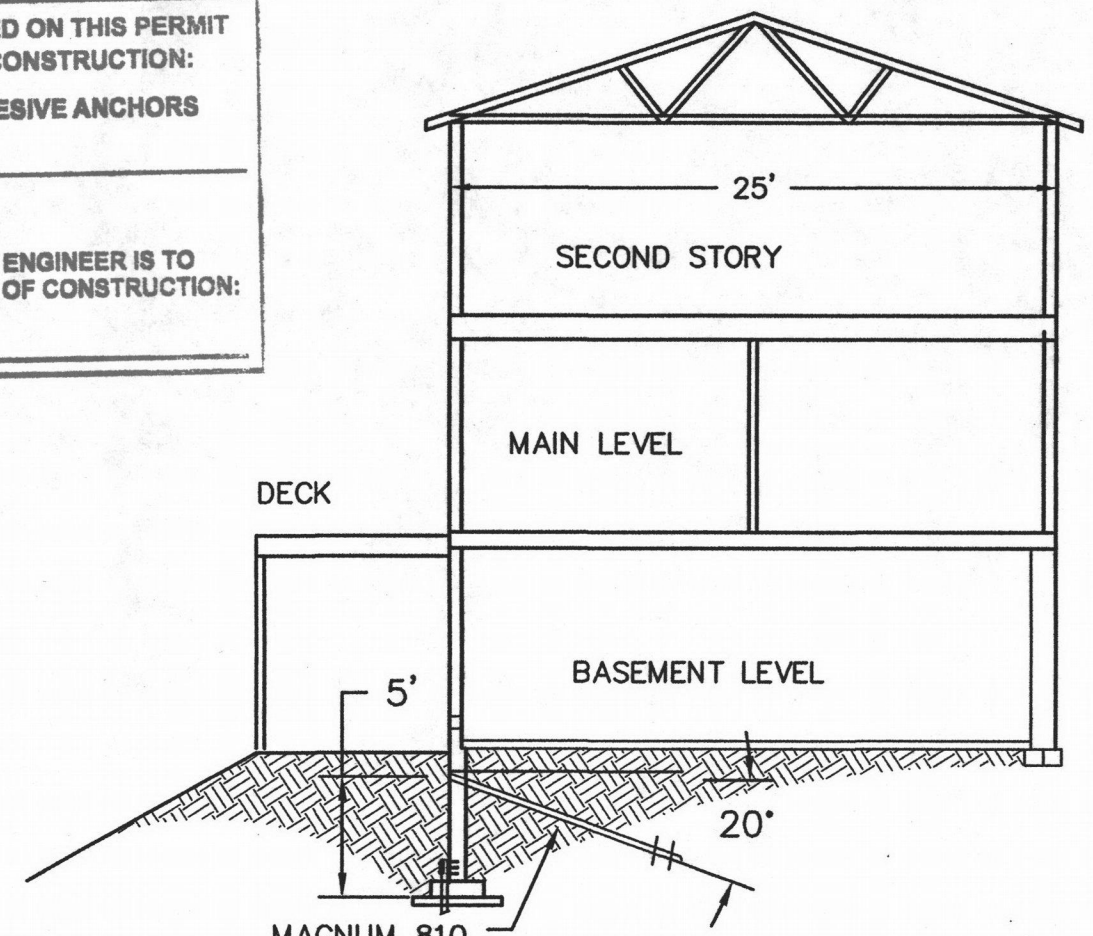


**SPECIAL INSPECTIONS ARE REQUIRED ON THIS PERMIT FOR THE FOLLOWING AREAS OF CONSTRUCTION:**

- STRUCTURAL STEEL
- REINFORCED CONCRETE
- EXPANSION/SCREW ANCHORS
- STRUCTURAL OBSERVATION BY THE ENGINEER IS TO OCCUR AT THE FOLLOWING STAGES OF CONSTRUCTION:

ADHESIVE ANCHORS



MAGNUM 810 HELICAL TIEBACK TO RESIST 10 K DESIGN LATERAL LOAD  
 16 K ALLOWABLE  
 14 K TEST LOAD  
 32 K ULTIMATE (16 TON)

**(A) CROSS SECTION**  
 S1 SCALE: 1"=8'-0"

**STRUCTURAL OBSERVATION NOTES**

THE PIERS SHALL BE INSTALLED UNDER PERIODIC INSPECTION FROM PROJECT ENGINEER MONITORING INSTALLATION DEPTH AND PRESSURE AND PROVIDE A FINAL REPORT DOCUMENTING THE PIER INSTALLATION TO THE CITY OF PORTLAND

THE DESIGN ENGINEER SHALL PERFORM STRUCTURAL OBSERVATION OF THE BRACKET INSTALLATION AND OBSERVE THE PUSHING OF THE PIERS ON A PERIODIC BASIS. THE INSTALLER SHALL KEEP LOGS OF THE PIER INSTALLATION NOTING DEPTH AND PRESSURE

THE PIER BRACKETS SHALL BE INSTALLED UNDER PERIODIC INSPECTION FROM AN THE DESIGN ENGINEER AND HE SHALL PROVIDE A FINAL REPORT DOCUMENTING THE PIER BRACKET INSTALLATION TO THE CITY OF PORTLAND

City of Portland  
 REVIEWED FOR CODE COMPLIANCE  
 MAR 26 2013  
 Permit Number

RENEWS 6/30/2014  
**REGISTERED PROFESSIONAL ENGINEER**  
 16478  
 Dean P. Zarosinski  
 OREGON  
 MAR. 16, 1993  
 DEAN P. ZAROSINSKI

City of Portland  
 REVIEWED FOR CODE COMPLIANCE  
 MAR 26 2013  
 Permit Number

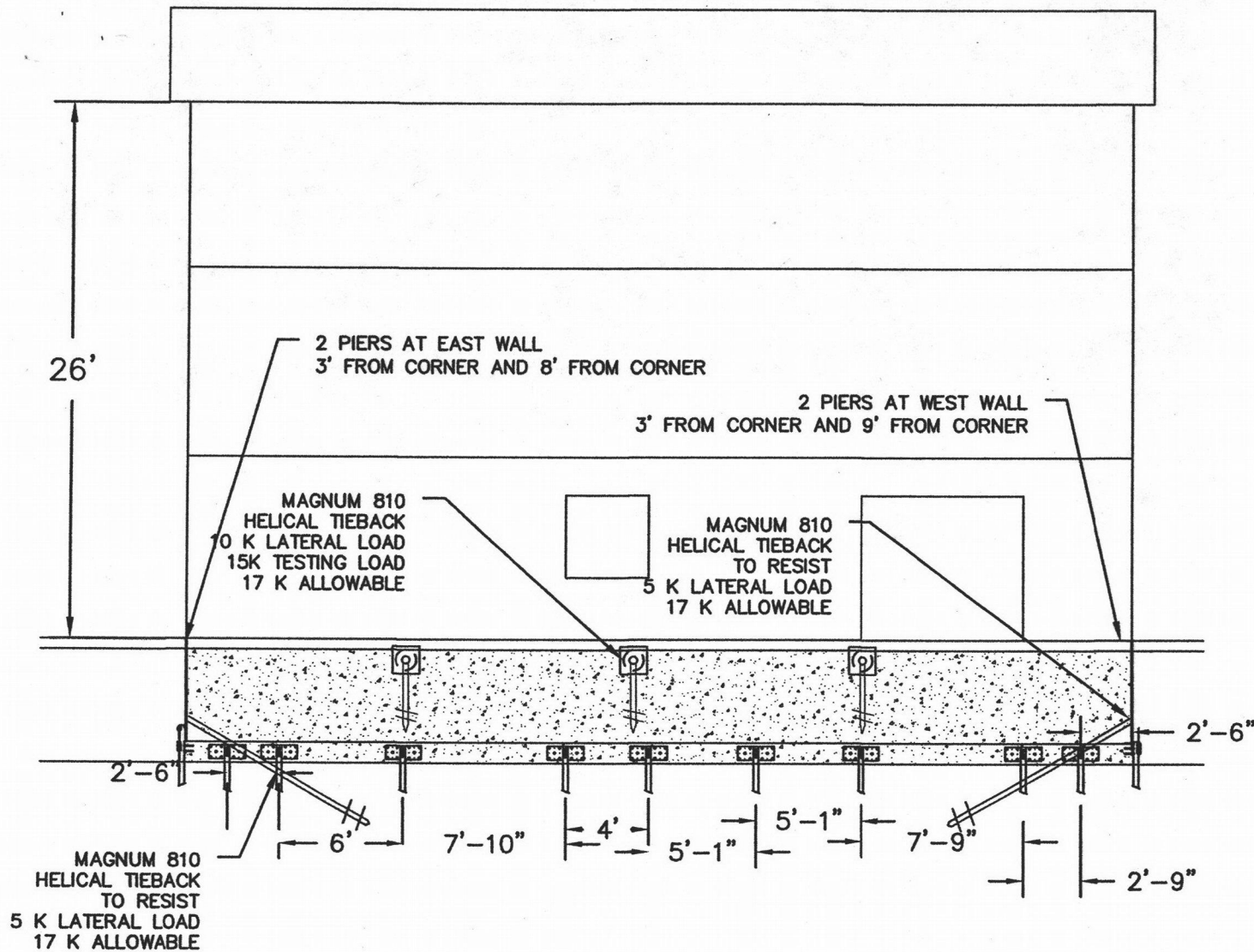
ZAROSINSKI Engineering & Design  
 1400 NW 156th Circle  
 Vancouver, WA 98685  
 PHONE: (360) 513-2746  
 EMAIL: dzaro@zaroenig.com  
 DATE: 2/21/13  
 DRAWN BY: DPZ  
 3/20/13

PUSH PIER INSTALLATION SITE PLAN & SECTION  
 TITLE  
 PERMIT DRAWINGS FOR FOUNDATION REPAIR  
 2829 SW STANLEY COURT  
 PORTLAND, OREGON 97219

JOB NO: K0071-1  
 DRAW NO: K0071-1  
 SCALE: NOTED  
 SHEET: S1

ZARO CAD FILE:K0071-1-1.DWG





**PF NORTH ELEVATION SHOWING PIER LAYOUT**  
S1 SCALE: 1"=8'-0"

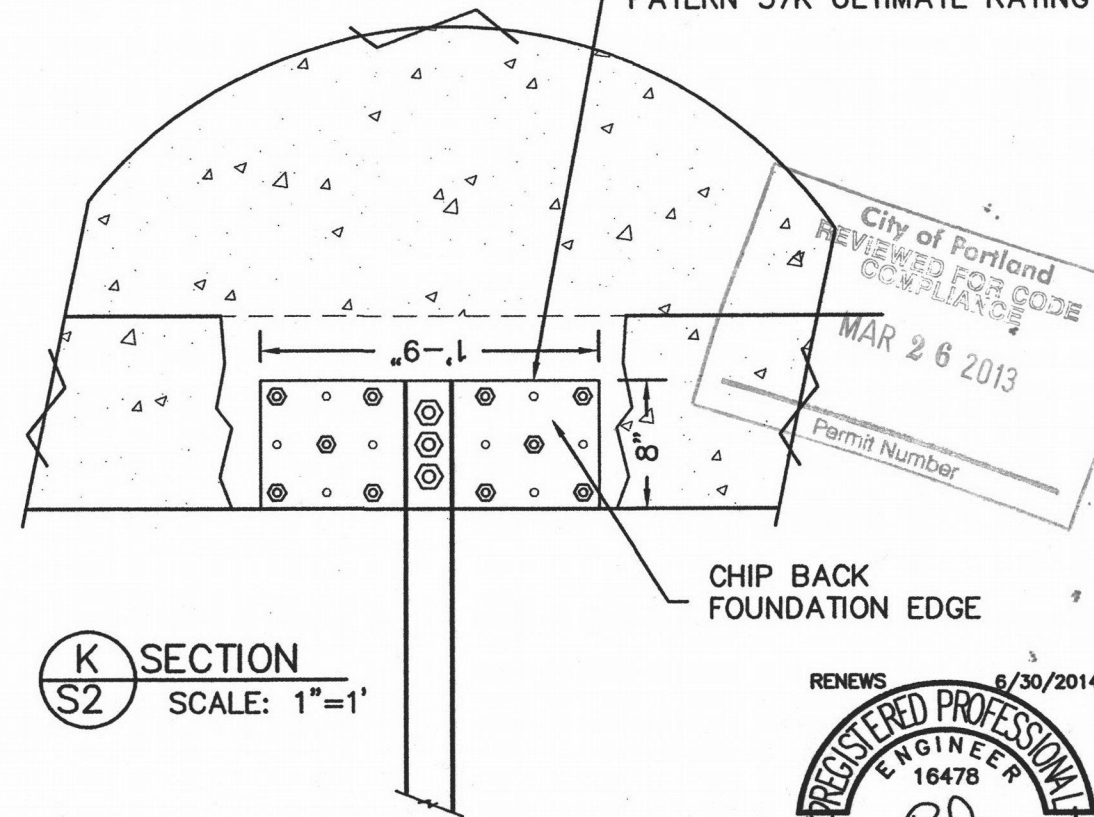
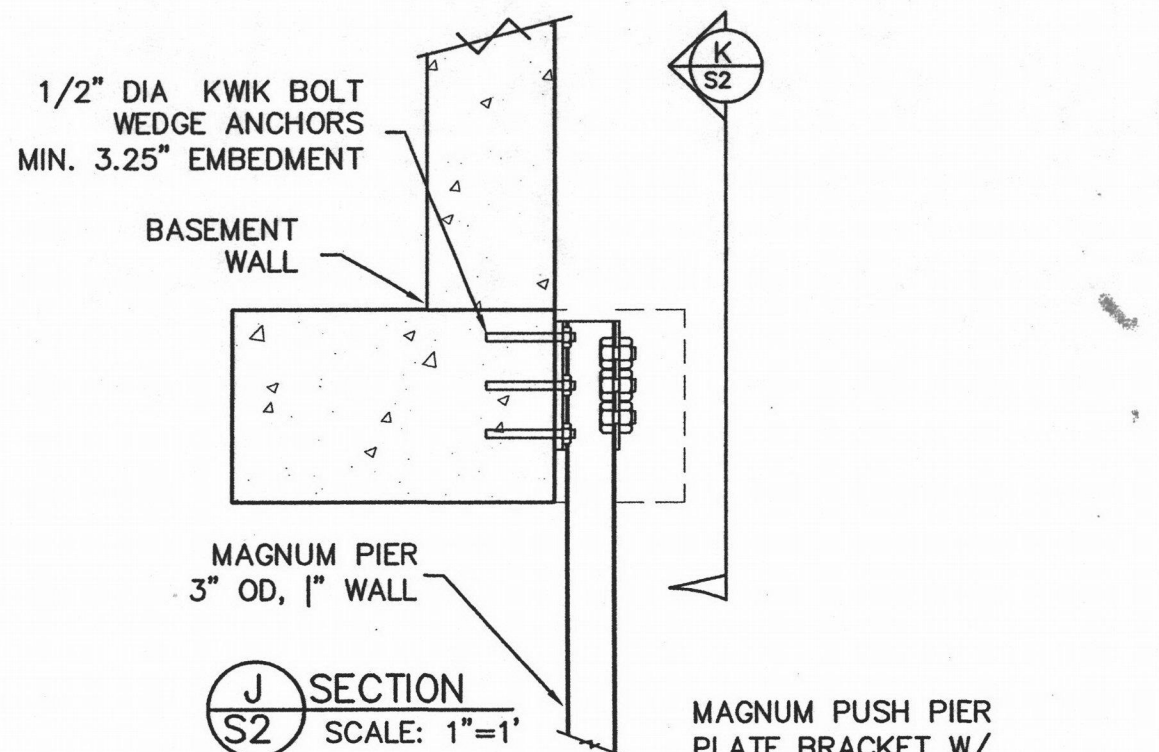
THE DESIGN LOAD ON THE VERTICAL PIERS IS 2513 lbs PER FOOT  
AT 5' ON CENTER THE LOAD IS 12565 POUNDS

THE DESIGN LOAD ON THE LATERAL HELICAL IS 4875 LBS

FOUNDATION INVESTIGATION SHOWS THE INNER BASEMENT WALL IS  
SELF SUPPORTING AND THE OUTER WALL DOES NOT SUPPORT THE INNER WALL

TYPICAL CONNECTION MAGNUM PUSH PIER  
W/ STANDARD ANGLE BRACKET USING  
2 BOLT CONNECTION TO PILE AND (10) 1/2"  
BOLTS TO FTG. W/ HILTI KWIK BOLT TZ SS  
1/2" DIAMETER BOLTS W/ 3 1/4" EMBEDMENT

TO LIFT THE FOUNDATION, INSTALL WALL PIERS  
AND UNIFORMLY LIFT THE STRUCTURE. WHEN  
FINAL GRADE IS REACHED, INSTALL BOLTS THROUGH  
PIER BRACKET INTO PIER SECTION



City of Portland  
REVIEWED FOR CODE  
COMPLIANCE  
MAR 26 2013  
Permit Number

RENEWS 6/30/2014  
**REGISTERED PROFESSIONAL ENGINEER**  
16478  
Dean P. Zarosinski  
OREGON  
MAR. 16, 1993  
DEAN P. ZAROSINSKI

SUBTITLE: PUSH PIER LAYOUT AND DETAILS  
TITLE: PERMIT DRAWINGS FOR FOUNDATION REPAIR  
2829 SW STANLEY COURT  
PORTLAND, OREGON 97219

**Zarosinski Engineering & Design**  
1400 NW 155th Circle  
Vancouver, WA, 98685  
PHONE: (360) 513-2746  
EMAIL: dzaro@zaroseng.com

DATE: 2/21/13  
DRAWN BY: DPZ

JOB NO.: K0071-1  
DWG. NO.: K0071-1  
SCALE: NOTED  
SHEET: S2

ZARO CAD FILE:K0071-1.DWG

DATE: 2/21/13

DRAWN BY: DPZ

3/18/13





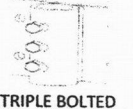
## MAGNUM® MP1001-3 Plate Bracket

### Allowable Capacity 26 Tons

8.00" x 21.00" x 0.375" Plate with 18 - 0.50" Thru Holes & 3.00" I.D. Collar  
Fits MH313, MH313R, MH325, and MH325R Magnum® Helical Piles  
and MP313 and MP325 Magnum® Steel Push Piers

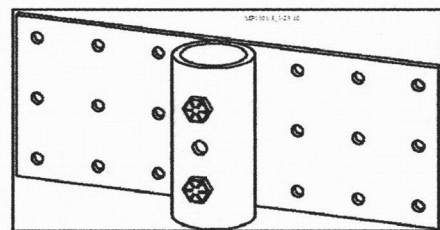


SPECIFICATIONS	
Collar Tube	0.37 in. x 3.00 in. I.D. ASTM A513 GR65+
Configuration	8.00" x 21.00" x 0.375" Plate with 18 - 0.50" Thru Holes for Expansion Anchors
Pile Connection	(1, 2, or 3) 0.75" SAE GR8 / ASTM A480
Surface Coating	Galvanized per ASTM A153/A123 (G) or Standard Magnum Blue Paint (P)
Compatibility	MH313, MH313R, MH325, MH325R, MP313, and MP325

CONNECTION TYPE	ULTIMATE CAPACITY 0.13 / 0.25 Wall Pile	ALLOWABLE CAPACITY 0.13 / 0.25 Wall Pile
 SINGLE BOLTED	10 Tons / 18 Tons	5 Tons / 9 Tons
 DOUBLE BOLTED	17 Tons / 35 Tons	8 Tons / 18 Tons
 TRIPLE BOLTED	28 Tons / 53 Tons	14 Tons / 26 Tons

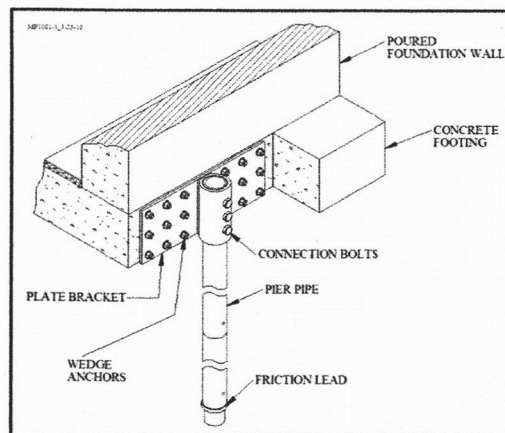
### Description

The Magnum MP1001-3 plate bracket has 53 tons maximum ultimate capacity, 26 tons working capacity in compression and tension. The bracket consists of a collar tube with (3) 0.75" threaded bolt holes for connection to Magnum helical piles and Magnum push piers and 18 thru holes for attachment to existing concrete using concrete expansion anchors. The bracket is designed in accordance with ICC-ES document AC308 as well as IBC, ACI, and AISC codes. Design and detailing of the connection to the structure varies by project and is the responsibility of registered design professional including maximum concrete span, pier spacing, concrete shear, and concrete bearing.



### Installation Notes:

Prepare the existing foundation. For steel push pier applications, attach the bracket and Magnum ram. Install the push pier to the required pressure and load test. For helical pile applications, excavate the pier location so the helix bearing plates fit below the existing foundation and the shaft is as close as possible to the face of the foundation. Install the helical pile to the correct depth and torque. Mount the bracket by sliding down the shaft rotating into position. In both cases, lift the structure as needed using either a Magnum ram or lifting fixture. Drill holes and bolt the bracket to the pile.



All Magnum Steel & Products Made in U.S.A.

**Magnum Piering, Inc.**  
6082 Schumacher Park Dr.  
West Chester, OH 45069  
800-822-7437  
www.magnumpiering.com

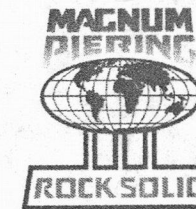
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U.S. Patents 6,058,662 and 5,234,287; Other Patents Pending.

Rev. 3-23-10

## MAGNUM® MP313 Push Pier

### 13 Tons Allowable Structural Capacity in Compression

High-Strength 3.00" Diameter, 0.13" Wall, Round-Shaft  
Push Piers with Male-Female Slip Connectors



### Description

Magnum® MP313 push piers have a structural capacity in compression of 26 tons ultimate and 13 tons working. Push piers do not have tensile capacity unless the sections are welded together or a reinforcing steel bar and grout is placed in the pile casing. Sections couple together with male-female slip connectors. High strength steel offers increased buckling resistance compared to others. A friction reduction collar can be added to the pile to increase penetration depth. Sections are available in bare steel, epoxy powder coated, and galvanized. Galvanized coating extends average life expectancy to over 100 years even in highly corrosive environments. Custom lengths are available upon request. See Magnum® Technical Manual for additional information.



SPECIFICATIONS	
SHAFT	HSS 3.00" x 0.13" Wall ASTM A513 Grade 65 KSI, or Equiv.
I	1.10 in <sup>4</sup>
Ag	1.06 in <sup>2</sup>
S	0.74 in <sup>3</sup>
COUPLING	Inner 0.125" Sleeve
COATING	Hot-Dip Galvanized (G), Bare Steel (NG), or Epoxy Powder Coated (EP)
STANDARD RAM	8.30 in <sup>2</sup> Piston Area, 6,250 Maximum P.S.I.
STRUCTURAL CAPACITY IN COMPRESSION* Bare Steel / Galvanized (Tons)	
26 / 33	Ultimate
13 / 17	Allowable
CAPACITY FROM LOAD TEST**	
26 Tons	Maximum Test Load
17 Tons	Allowable from Test (F.S.=1.5)

\*Note1: Structural capacity is based on buckling strength of shaft in firm soils with fixed head conditions. Push piers shall be installed to appropriate depth into suitable bearing stratum as determined by geotechnical engineer or local practice. For tension capacity, push pier sections must be welded together or a reinforcing steel bar and grout must be placed in the pile.

\*\*Note2: Push pier capacity is determined by load test using Magnum installation rams or lifting kit. All push piers shall be load tested to 1.5 times the desired working load. Test load is limited by maximum safe operating ram pressure or buckling capacity of shaft, whichever is less.

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Rev. 3-23-10

Zarosinski Engineering & Design

FOUNDATION SUPPORT PIER DETAILS  
2 STORY HOUSE W/ DAYLIGHT BASEMENT  
2829 SW STANLEY COURT  
PORTLAND, OREGON

1400 NW 155th Circle  
Vancouver, WA 98685  
PHONE: (360) 513-2746  
EMAIL: dzaro@zaroeng.com

JOB NO.: K0071-1  
DRAWING NO.: K0071-1  
SCALE: NOTED  
SHEET: S3

ZARO CAD FILE:K0071-1.DWG

DATE: DPT

DRAWN BY: DPT

2/21/13



# MAGNUM® MH313B Helical Piles

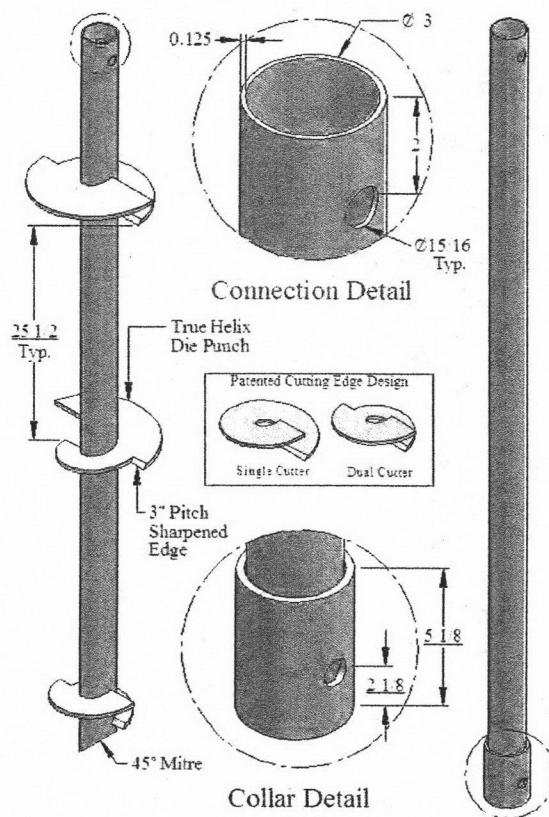
## 16 Ton Ultimate - 8 Ton Allowable Capacity

High-Strength 3.00" Diameter, 0.125" Wall, Round-Shaft with Rigid Coupler & (1) 7/8" Bolt



### Description

Magnum MH313B Helical Piles have 16 tons ultimate capacity and 8 tons working capacity in compression and tension. Lead sections and extensions couple together to extend helical bearing plates to the desired bearing stratum. Round shafts offer increased lateral and buckling resistance compared to solid square shafts. Capacity calculations are based on average life expectancy of over 75 years for most soil conditions. Patented Magnum Dual-Cutting Edge helical bearing plates (DCE) enhance penetration through dense soils with occasional cobbles and debris. Custom lengths and helix configurations are available upon request. See Magnum Technical Reference Manual for additional information including design tools, prescriptive specifications and example plans.



Drawing above shows an example pile lead and extension section. Section lengths and number of helices vary with project requirements and soil conditions.

### 3.0" Product Line Helical Bearing Plate Specifications & Available Configurations

- 0.375" Thick; ASTM A36 or Higher
- 3.00" Helix Pitch
- 8", 10", 12", 14" Diameter
- Standard Circular Helix, or Patented Dual Cutting Edge Helix
- Sharpened Edges - All Helix**
- \*3 ft. Lead or Extension - up to 2 helical bearing plates
- \*6 ft. Lead or Extension - up to 3 helical bearing plates
- \*10 ft. Lead or Extension - up to 6 helical bearing plates
- \*15 ft. Lead or Extension - up to 10 helical bearing plates
- \* **Standard Stocking Length**

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U.S. Patents 6,058,662 and 5,234,287; Other Patents Pending.

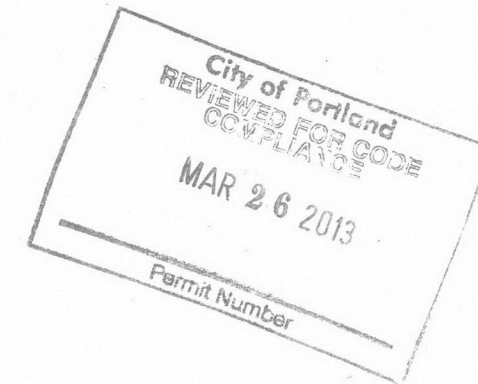
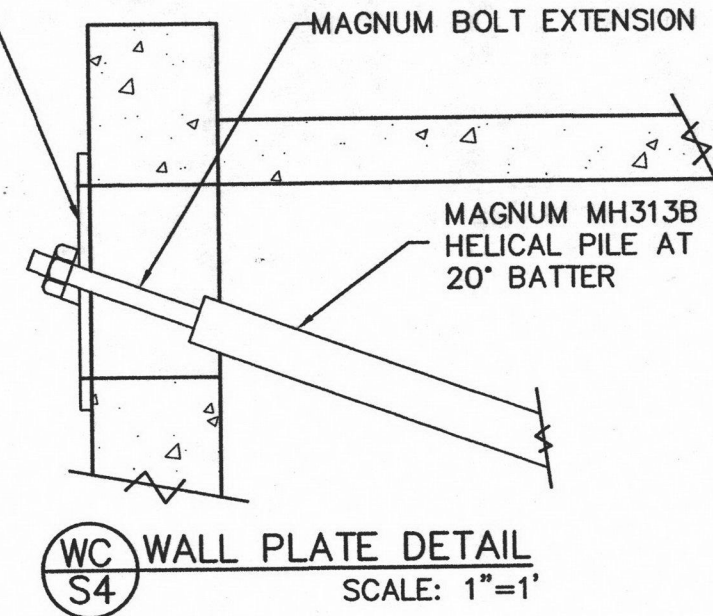
STEEL SPECIFICATIONS	
SHAFT	HSS 3.00" x 0.125" Wall ASTM A513 65 KSI, or Equivalent
I	New= 1.17 in <sup>4</sup> , Corroded= 0.70 in <sup>4</sup>
Ag	New= 1.13 in <sup>2</sup> , Corroded= 0.68 in <sup>2</sup>
S	New= 0.78 in <sup>3</sup> , Corroded= 0.48 in <sup>3</sup>
COUPLING	Outer 0.25" Sleeve
BOLTS	(1) 7/8" Diam. SAE J429 Grade 5 Zinc Coated to ASTM B695/F1941
BLADES	0.375" Thick, Helix Die-Pressed ASTM A36, or Better
COATING OPTIONS	Galvanized (G), Bare Steel (NG), Epoxy Powder Coated (EP)
PROPERTIES	
8 ft <sup>1</sup>	Ultimate Capacity-to-Torque Ratio
4,000 ft-lbs	Maximum Installation Torque
STRUCTURAL CAPACITY	
22 Tons	Ultimate Capacity
11 Tons	Allowable Capacity
CAPACITY BY TORQUE	
16 Tons	Ultimate Compression & Tension
8 Tons	Allowable Compression & Tension

**Note:** Helical piles shall be installed to appropriate depth into suitable bearing stratum as determined by geotechnical engineer or local practice. Capacity by torque is based on advancing pile to maximum installation torque. A minimum factor of safety of 2.0 is recommended for determining allowable capacity from correlations with final installation torque. Deflections of 0.5" are typical at allowable capacity. A higher factor of safety may be required for smaller deflections. For tension capacity, helical bearing plates must be deeply embedded. Load tests are recommended when practical.

**Magnum Piering, Inc.**  
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800-822-7437  
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16"x16"x3/4" PLATE WITH BEVELED WASHER



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HELICAL TIE DETAILS  
PERMIT DRAWINGS FOR FOUNDATION REPAIR  
2829 SW STANLEY COURT  
PORTLAND, OREGON 97219

JOB NO: K0071-1  
DWG NO: K0071-1  
SCALE: NOTED  
SHEET: S4

DRAWN BY: DPZ DATE: 3-7-13 ZARO CAD FILE:K0071-1.DWG