



December 15, 2023

Tom Engelhardt  
Garcia Construction  
1801 Lincoln Avenue  
Steamboat Springs, Colorado 80487

Re: Helical Pile Installation Observations  
Scorzafaza Residence Addition  
1495 Mark Twain Lane  
Steamboat Springs, Colorado  
Western Slope Geotech Project No. 23-1094

Dear Tom,

As requested, Western Slope Geotech, Inc. (WSG) visited the project site on December 4, 2023, to conduct special inspections of helical pile installations for the above referenced job. During our site visit, two (2) helical pile installations were observed to completion. Overall, Steamboat Springs Excavating installed two (2) 8 and 10-inch combination helix, 2 7/8-inch shaft Pier Tech® piles at the plan locations shown on Figure 1.

The proposed single 45-kip design pile was replaced by installation of two piles 25-kip design load piles. Plan locations are shown on Figure 1.

Based on our installation observations and review of additional contractor-supplied installation data, all piles were advanced with final below grade penetrations ranging from approximately 7 to 10 feet. Pile installation data is attached.

**Design Installation Torque Requirements:** Based on a review of the structural plans, we understand minimum design pile capacities ranging from approximately 6,000 lbs to 26,000 lbs (6 to 26 kips) were required. Using PierTech® design guidelines, the pile capacity equation is shown below.

$$Q_{\text{design}} (\text{kips}) = K_t \times T$$

Where:  $K_t$  (2 7/8" pile) = Empirical Installation Torque Coefficient = 9 ft-lb

And  $T$  = Installation Torque (ft-lbs)

Therefore, minimum required installation torques are:

$$T_{25 \text{ kip}} = Q_{(\text{design})} / 9^{-1} = (25 \text{ kips}) / 9^{-1} \text{ kips/ft-lb} = 2,277 \text{ ft-lbs (for 25-kip piles)}$$

**Use Minimum Installation Torque = 3,000 ft-lbs (for all piles)**

**REVIEWED  
FOR CODE  
COMPLIANCE**

**12/19/2023**

Western Slope Geotech, Inc.  
P.O. Box 771330 • Steamboat Springs, CO 80477 • (970) 875-4075

**Conclusions and Limitations:** Based on our part-time observations and review of contractor supplied data (via electronic torque data recording device), two (2) piles were installed to a minimum installation torque of 3,000 ft-lbs and met the minimum project design load capacity requirements.

One pile (HP-1) was installed to refusal condition at a depth of approximately 7 feet. No relevant installation torque value was recorded for this pile due to refusal conditions. Based on manufacturer design guidelines, piles advanced to the refusal condition are typically relied upon to provide supporting capacities equal to the rated pile capacities (60 kips).

Helical pile installation logs are attached. Steamboat Springs Excavating's installer certificate and torque monitor calibration certificate are also attached.

WSG does not warranty the foundation design, pile installation, installation torque requirements or measurements, or rated pile capacities. Installation torque requirements and calculations are based on review of "*PierTech Systems – Design/Engineering Handbook*", 2006, PierTech Systems, LLC.

WSG appreciates the opportunity to be of service to you on this project. If you have any questions concerning our observations or if we can be of further service to you in any way, please do not hesitate to contact us.

Very Truly Yours,  
**Western Slope Geotech, Inc.**



Harold Schlicht, P.E.  
Principal Engineer

**REVIEWED  
FOR CODE  
COMPLIANCE**

**12/19/2023**



# ASCEND

**SCORZAFAZA GARAGE ADDITION**  
BETTINA & KEVIN SCORZAFAVA

PROJECT NUMBER:	2022-009
DATE:	MARCH 10, 2023
DRAWN BY:	FRANK

**PERMIT SET**

ST

SHEET: 10 of 15

## SITE PLAN/LOCATION OF PILES

12/19/2023

Project Name: Scorzafaza Addition

**Location:** 1495 Mark Twain Lane, Steamboat Springs, CO

STEAMBOAT SPRINGS  
COLORADO

Project No.: 23-1094	Drawn/Checked:HS
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Date: 12/14/23	Figure No.: 1
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**REVIEWED  
FOR CODE  
COMPLIANCE**

**12/19/2023**



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**REVIEWED  
FOR CODE  
COMPLIANCE**

**12/19/2023**





THIS  
**Certificate of Training**  
Certifies That

**Casey O'Donnell**

Steamboat Springs Excavating

Has Successfully Completed the Required Course of  
**Analyzation and Installation of the Pier Tech Helical System**

For PierTech Systems®, LLC.

A handwritten signature in black ink, appearing to read "Casey O'Donnell", written over a horizontal line.

Company Officer Signature

August 15th, 2018

Effective Date



This Certificate of Training is only valid if signed by an approved PierTech systems, LLC. company officer







THIS  
**Certificate of Training**  
Certifies That

**Josh Scott**

Steamboat Springs Excavating

Has Successfully Completed the Required Course of  
Analyzation and Installation of the Pier Tech Helical System

For PierTech Systems®, LLC.

A handwritten signature in black ink, appearing to read "A. Scott", written over a horizontal line.

Company Officer Signature

August 15th, 2018

Effective Date



This Certificate of Training is only valid if signed by an approved PierTech systems, LLC. company officer







# CALIBRATION CERTIFICATE

DOCUMENT #: 2813

The load cell under test was tested using procedure: **TP-0124**

MODEL: SP-030

CAPACITY: 30000

SERIAL #: 60300300069

TEST 1	
APPLIED FORCE (FT-LBS)	OUTPUT (FT-LBS)
3000	3003
6000	5991
9000	9002
12000	12000
15000	14993
18000	17999
21000	20994
24000	23999
27000	26995
30000	29998

OUTPUT ERROR %: -0.02

TEST 2	
APPLIED FORCE (FT-LBS)	OUTPUT (FT-LBS)
3000	3001
6000	5989
9000	8997
12000	11996
15000	14999
18000	18004
21000	21001
24000	24002
27000	26996
30000	29997

OUTPUT ERROR %: -0.01

AllTorqueHD Specifications: Pass/Fail mark is +/- 0.5% on total test averages.

Allweigh Scale Systems Inc. certifies that the force measurement Load Cell used for testing is traceable to primary standards at NIST.  
Force Standard STD-10 NST#STD-10C3116  
Instrumentation used for testing calibrated using CX-0440 Precision mV/V Simulator  
Serial# 1981, Standard Used: #738 Fluke, Model 8508A  
Load Cell Model 1620AJH-50K Serial# 1025449 – Gold Standard

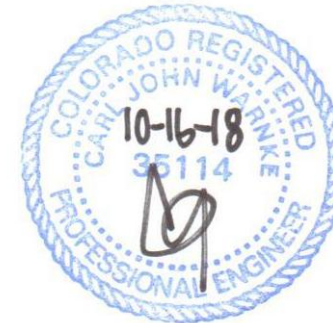
**REVIEWED  
FOR CODE  
COMPLIANCE**

TECHNICIAN: 9279c0ea

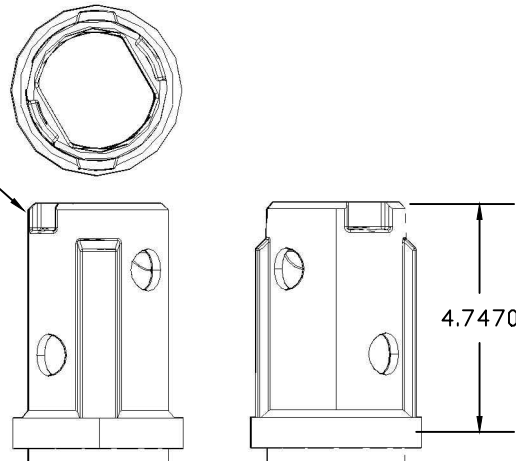
CALIBRATION DATE: 2023-07-10

**12/19/2023**

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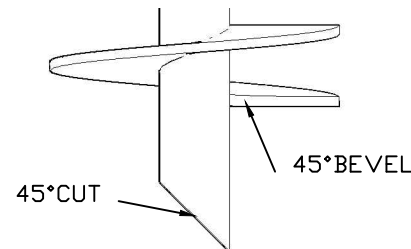


PIERTECH  
PATENTED  
CROSS-LOCK  
COUPLING



4.7470

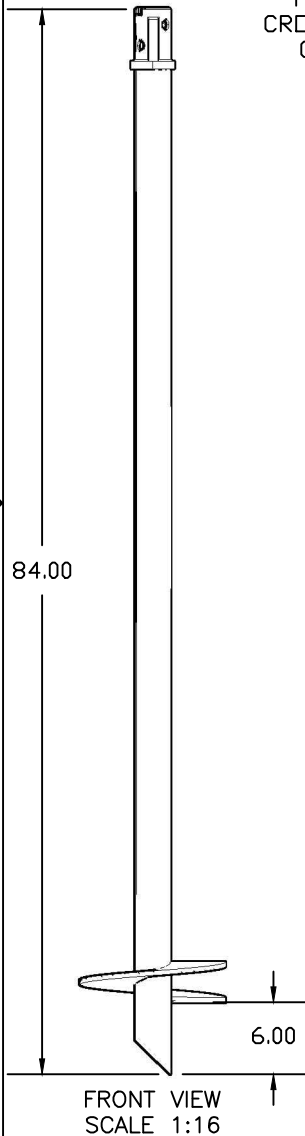
DRIVE COUPLING DETAIL  
SCALE 1:4



HELIX DETAIL  
SCALE 1:8

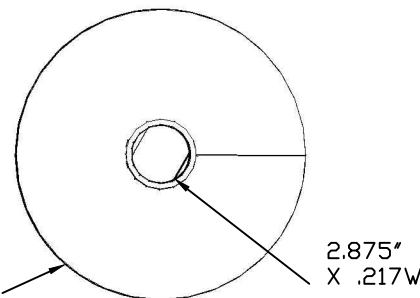
NOTES:

1. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.
2. ALL WELDS PER AWS D1.1.
3.  $\frac{1}{4}$ " FILLET WELD ON EACH SIDE OF THE HELIX AND BOTTOM OF COUPLING.
4. SHAFT MATERIAL 60KSI MIN YIELD.
5. HELIX MATERIAL 50KSI MIN YIELD.
6. FINISH: HOT-DIPPED GALVANIZED PER ASTM A123/153.
7. BOLTS:  $\frac{3}{4}$ " GRADE 5 MIN.
8. RECOMMENDED KT FACTOR = 9 (1/FT).
9. ULTIMATE SHAFT RATING = 100 KIPS
10. ALLOWABLE SHAFT RATING = 50 KIPS
11. ULTIMATE GEOTECHNICAL CAPACITY BASED ON A KT OF 9 (1/FT) = 79.2 KIPS.
12. ULTIMATE TORQUE RATING = 8,800 FT-LBS.



FRONT VIEW  
SCALE 1:16

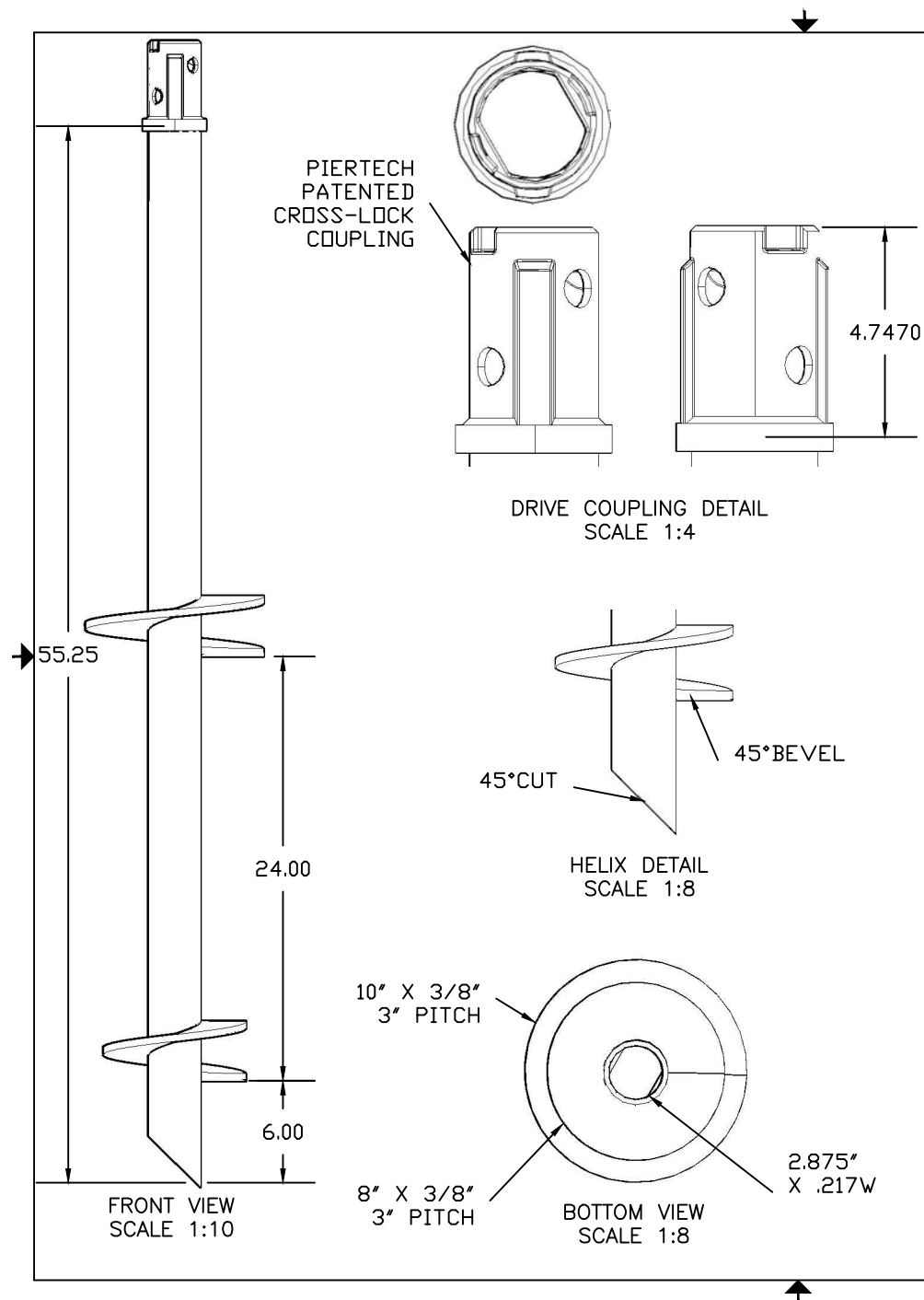
12" X  $\frac{3}{8}$ "  
3" PITCH



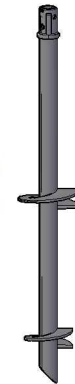
BOTTOM VIEW  
SCALE 1:8

ITEM	PART NO.	QTY	DESCRIPTION
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DRAWN 6/23/15 MW			L_CL_2.880D_.217W_7FT_12_.375_GALV
CHECK 6/23/15 NP			TOLERANCES UNLESS OTHERWISE SPECIFIED .X $\pm$ .1 .XX $\pm$ .03 .XXX $\pm$ .010 ANGLE $\pm$ 1 DEG
SIZE DWG NO			REV
A 2.88-L712G			-
SCALE VARIES		WEIGHT 62_LBS	SHEET 1_OF_1

**PierTech**  
SYSTEMS®



REV	DESCRIPTION	DATE	APPROVED



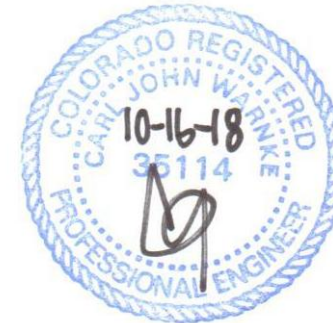
#### NOTES:

1. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.
2. ALL WELDS PER AWS D1.1.
3.  $\frac{1}{4}$ " FILLET WELD ON EACH SIDE OF THE HELIX AND BOTTOM OF COUPLING.
4. SHAFT MATERIAL 60KSI MIN YIELD.
5. HELIX MATERIAL 50KSI MIN YIELD.
6. FINISH: HOT-DIPPED GALVANIZED PER ASTM A123/153.
7. BOLTS:  $\frac{3}{4}$ " GRADE 5 MIN.
8. RECOMMENDED KT FACTOR = 9 (1/FT).
9. ULTIMATE SHAFT RATING = 100 KIPS
10. ALLOWABLE SHAFT RATING = 50 KIPS
11. ULTIMATE GEOTECHNICAL CAPACITY BASED ON A KT OF 9 (1/FT) = 79.2 KIPS.
12. ULTIMATE TORQUE RATING = 8,800 FT-LBS.

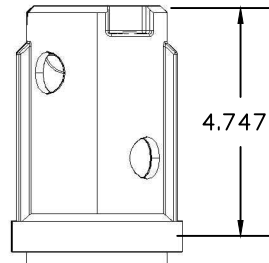
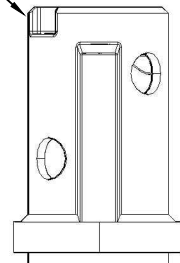
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DRAWN 6/17/15 MW	L__CL_2.880D_.217W_5FT_8-10_.375_GALV		
CHECK 6/17/15 NP	TOLERANCES UNLESS OTHERWISE SPECIFIED .X ± .1 .XX ± .03 .XXX ± .010 ANGLE ± 1 DEG		
	SIZE	DWG NO	REV
	A	2.88-L5810G	-
	SCALE VARIES	WEIGHT 49_LBS	SHEET 1_OF_1



REV	DESCRIPTION	DATE	APPROVED



PIERTECH  
PATENTED  
CROSS-LOCK  
COUPLING

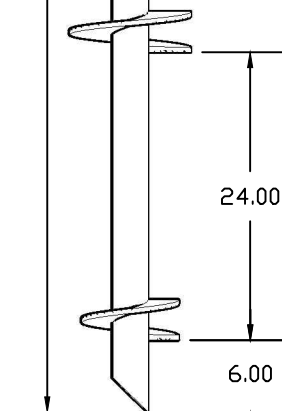


4.7470

DRIVE COUPLING DETAIL  
SCALE 1:4

2-7/8"OD  
X.217WALL

79.25



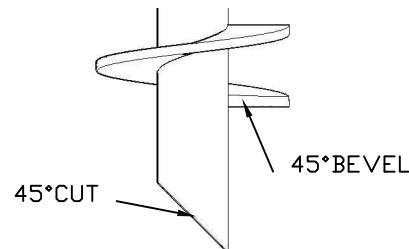
FRONT VIEW  
SCALE 1:16

24.00

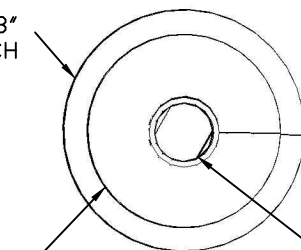
6.00

10" X 3/8"  
3" PITCH

8" X 3/8"  
3" PITCH



HELIX DETAIL  
SCALE 1:8



BOTTOM VIEW  
SCALE 1:8

2.875"  
X .217W

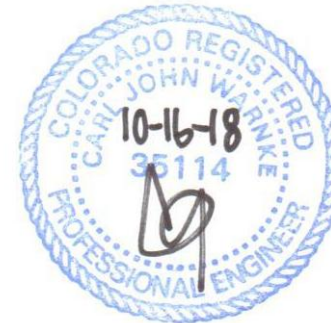
#### NOTES:

1. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.
2. ALL WELDS PER AWS D1.1.
3. 1/4" FILLET WELD ON EACH SIDE OF THE HELIX AND BOTTOM OF COUPLING.
4. SHAFT MATERIAL 60KSI MIN YIELD.
5. HELIX MATERIAL 50KSI MIN YIELD.
6. FINISH: HOT-DIPPED GALVANIZED PER ASTM A123/153.
7. BOLTS: 3/4" GRADE 5 MIN.
8. RECOMMENDED KT FACTOR = 9 (1/FT).
9. ULTIMATE SHAFT RATING = 100 KIPS
10. ALLOWABLE SHAFT RATING = 50 KIPS
11. ULTIMATE GEOTECHNICAL CAPACITY BASED ON A KT OF 9 (1/FT) = 79.2 KIPS.
12. ULTIMATE TORQUE RATING = 8,800 FT-LBS.

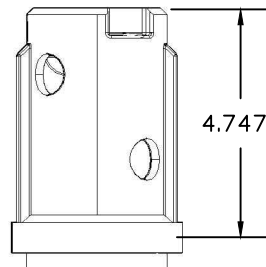
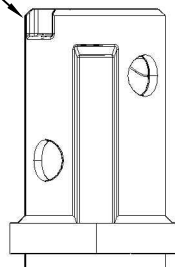
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DRAWN 2/23/16 MW			L_CL_2.880D_.217W_7FT_8-10_.375_GALV
CHECK 2/23/16 NP			TOLERANCES UNLESS OTHERWISE SPECIFIED
			.X ± .1 .XX ± .03 .XXX ± .010 ANGLE ± 1 DEG
SIZE DWG NO			REV
A 2.88-L7810G			-
SCALE VARIES		WEIGHT 62_LBS	SHEET 1_OF_1

**PierTech**  
SYSTEMS

REV	DESCRIPTION	DATE	APPROVED

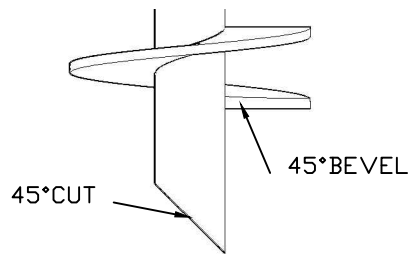


PIERTECH  
PATENTED  
CROSS-LOCK  
COUPLING



4.7470

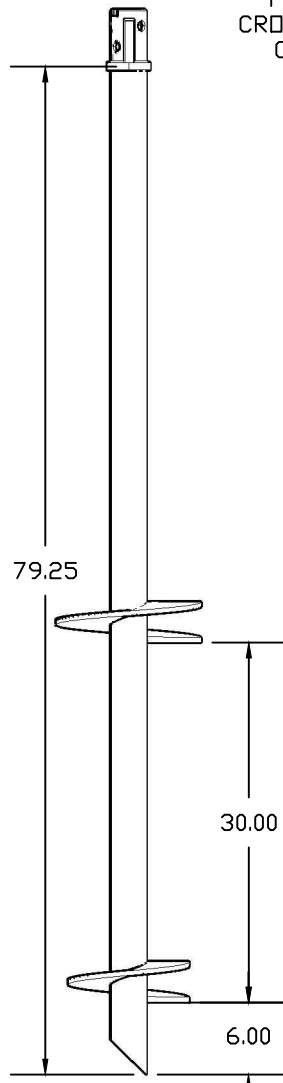
DRIVE COUPLING DETAIL  
SCALE 1:4



HELIX DETAIL  
SCALE 1:8

NOTES:

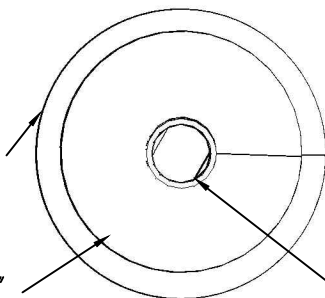
1. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.
2. ALL WELDS PER AWS D1.1.
3.  $\frac{1}{4}$ " FILLET WELD ON EACH SIDE OF THE HELIX AND BOTTOM OF COUPLING.
4. SHAFT MATERIAL 60KSI MIN YIELD.
5. HELIX MATERIAL 50KSI MIN YIELD.
6. FINISH: HOT-DIPPED GALVANIZED PER ASTM A123/153.
7. BOLTS:  $\frac{3}{4}$ " GRADE 5 MIN.
8. RECOMMENDED KT FACTOR = 9 (1/FT).
9. ULTIMATE SHAFT RATING = 100 KIPS
10. ALLOWABLE SHAFT RATING = 50 KIPS
11. ULTIMATE GEOTECHNICAL CAPACITY BASED ON A KT OF 9 (1/FT) = 79.2 KIPS.
12. ULTIMATE TORQUE RATING = 8,800 FT-LBS.



FRONT VIEW  
SCALE 1:16

12" X  $\frac{3}{8}$ "  
3" PITCH

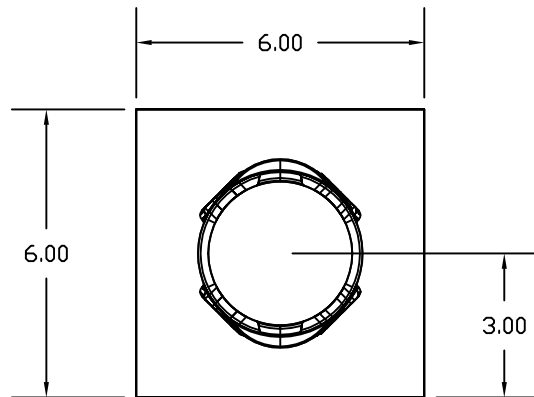
10" X  $\frac{3}{8}$ "  
3" PITCH



BOTTOM VIEW  
SCALE 1:8

2.875"  
X .217W

ITEM	PART NO.	QTY	DESCRIPTION
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DRAWN 6/23/15 MW	L__CL_2.880D_.217W_7FT_10-12_.375_GALV		
CHECK 6/23/15 NP	TOLERANCES UNLESS OTHERWISE SPECIFIED .X $\pm$ .1 .XX $\pm$ .03 .XXX $\pm$ .010 ANGLE $\pm$ 1 DEG		
SIZE	DWG NO	REV	
A	2.88-L71012G	-	
SCALE VARIES	WEIGHT 69_LBS	SHEET 1_OF_1	

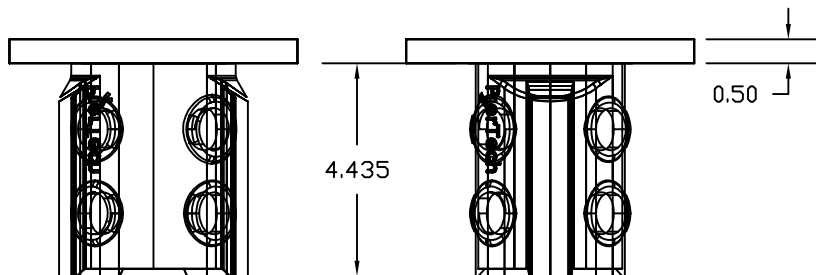


TOP VIEW SCALE 1:4



NOTES:

1. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.
2. ALL WELDS PER AWS D1.1.
3.  $\frac{1}{4}$ " FILLET WELD ON COUPLING.
4. PLATE MATERIAL 50KSI MIN YIELD.
5. FINISH: HOT-DIPPED GALVANIZED PER ASTM A123/153.
6. BOLTS:  $\frac{3}{4}$ " GRADE 5 MIN.
7. ULTIMATE COMPRESSIVE RATING = 80 KIPS
8. ALLOWABLE COMPRESSIVE RATING = 40 KIPS



LEFT VIEW  
SCALE 1:4

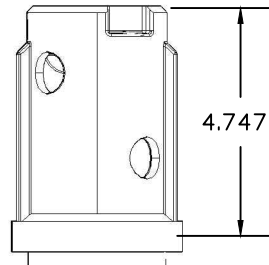
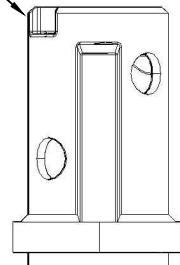
FRONT VIEW SCALE 1:4

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DRAWN 7/2/15 MW	RS2-7/8NEWCONSTBRKT_6X6X1/2GALV		
CHECK 7/2/15 NP	TOLERANCES UNLESS OTHERWISE SPECIFIED .X ± .1 .XX ± .03 .XXX ± .010 ANGLE ± 1 DEG		
SIZE	DWG NO.	REV	
A	2.88-BNC665G		
SCALE	VARIES	WEIGHT	NA
SHEET		1_OF_1	



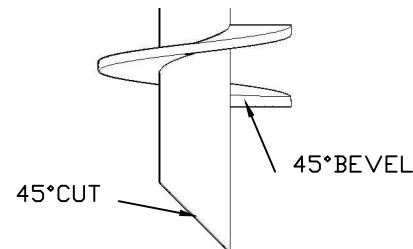
REV	DESCRIPTION	DATE	APPROVED

PIERTECH  
PATENTED  
CROSS-LOCK  
COUPLING

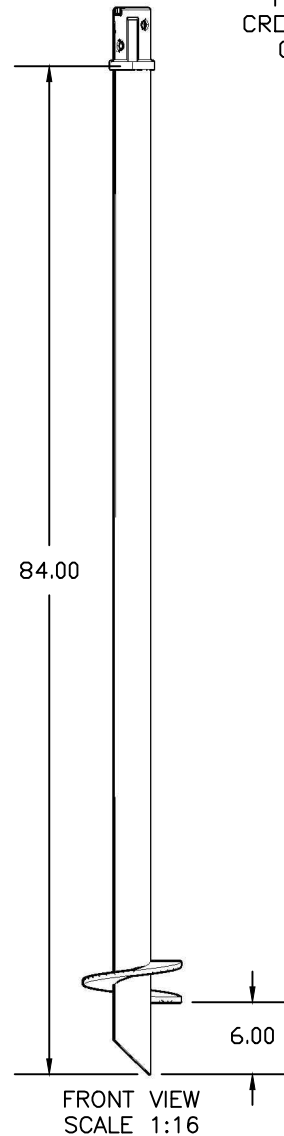


4.7470

DRIVE COUPLING DETAIL  
SCALE 1:4

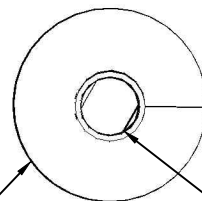


HELIX DETAIL  
SCALE 1:8



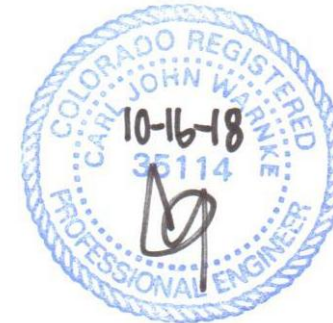
FRONT VIEW  
SCALE 1:16

8" X 3/8"  
3" PITCH



BOTTOM VIEW  
SCALE 1:8

2.875"  
X .217W



NOTES:

1. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.
2. ALL WELDS PER AWS D1.1.
3.  $\frac{1}{4}$ " FILLET WELD ON EACH SIDE OF THE HELIX AND BOTTOM OF COUPLING.
4. SHAFT MATERIAL 60KSI MIN YIELD.
5. HELIX MATERIAL 50KSI MIN YIELD.
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DRAWN 6/17/15 MW			L_CL_2.88OD_.217W_7FT_8_.375_GALV
CHECK 6/17/15 NP			TOLERANCES UNLESS OTHERWISE SPECIFIED
			.X $\pm$ .1 .XX $\pm$ .03 .XXX $\pm$ .010 ANGLE $\pm$ 1 DEG
SIZE DWG NO			REV
A 2.88-L78G			-
SCALE VARIES		WEIGHT 54_LBS	SHEET 1_OF_1

**PierTech**  
SYSTEMS

REV	DESCRIPTION	DATE	APPROVED
A	Change It		

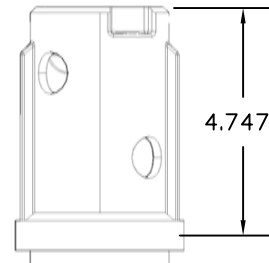
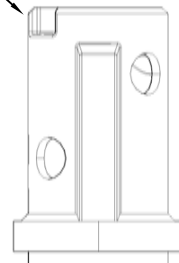
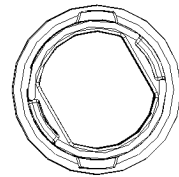


#### NOTES:

1. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.
2. ALL WELDS PER AWS D1.1.
3.  $\frac{1}{4}$ " FILLET WELD ON EACH SIDE OF THE HELIX AND BOTTOM OF COUPLING.
4. SHAFT MATERIAL 60KSI MIN YIELD.
5. HELIX MATERIAL 50KSI MIN YIELD.
6. FINISH: HOT-DIPPED GALVANIZED PER ASTM A123/153.
7. BOLTS:  $\frac{3}{4}$ " GRADE 5 MIN.
8. RECOMMENDED KT FACTOR = 9 (1/FT).
9. ULTIMATE SHAFT RATING = 100 KIPS
10. ALLOWABLE SHAFT RATING = 50 KIPS
11. ULTIMATE GEOTECHNICAL CAPACITY BASED ON A KT OF 9 (1/FT) = 79.2 KIPS.
12. ULTIMATE TORQUE RATING = 8,800 FT-LBS.

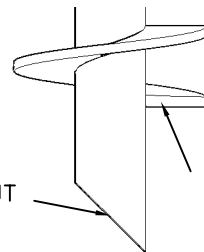
ITEM	PART NO.	QTY	DESCRIPTION
THIS DRAWING AND ALL INFORMATION THERE ON IS THE PROPERTY OF PIERTECH, LLC AND IS CONSIDERED CONFIDENTIAL AND PROPRIETARY. COPYING, DISCLOSURE, TRANSMITTING TO OTHERS, AND ANY OTHER USE IS HEREBY PROHIBITED UNLESS CONSENT HAS BEEN OBTAINED. THIS DRAWING SHALL BE RETURNED OR DESTROYED AT THE REQUEST OF IT'S OWNER. THIS DRAWING IS PROTECTED BY FEDERAL COPYRIGHT LAWS AND/OR FEDERAL AND STATE TRADE SECRET LAWS. ALL RIGHTS RESERVED			<b>PierTech</b> SYSTEMS®
DRAWN 6/23/15 MW	L_CL_2.880D_.217W_7FT_8-10-12_.375_GALV		
CHECK 6/23/15 NP	TOLERANCES UNLESS OTHERWISE SPECIFIED .X ± .1 .XX ± .03 .XXX ± .010 ANGLE ± 1 DEG		
	SIZE	DWG NO	REV
	A	2.88-L781012G	A
	SCALE VARIES	WEIGHT NA	SHEET 1_OF_1

PIERTECH  
PATENTED  
CROSS-LOCK  
COUPLING



4.7470

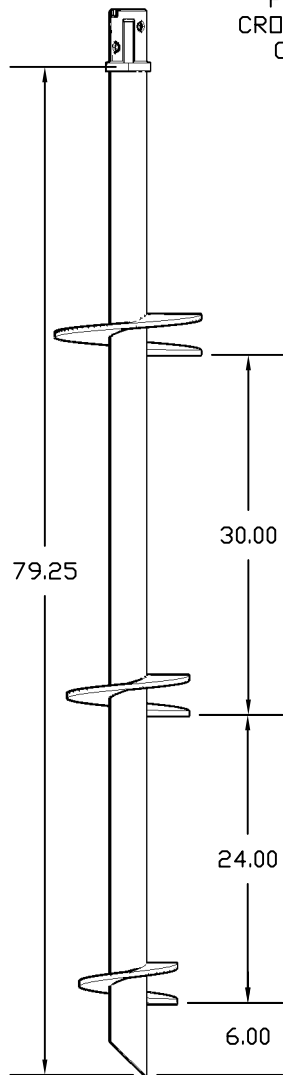
DRIVE COUPLING DETAIL  
SCALE 1:4



45° CUT

45° BEVEL

HELIX DETAIL  
SCALE 1:8

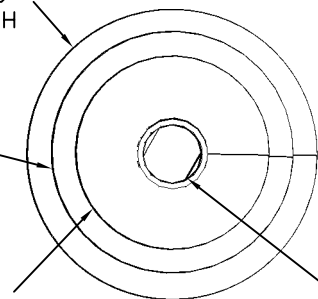


FRONT VIEW  
SCALE 1:16

12" X  $\frac{3}{8}$ "  
3" PITCH

10" X  $\frac{3}{8}$ "  
3" PITCH

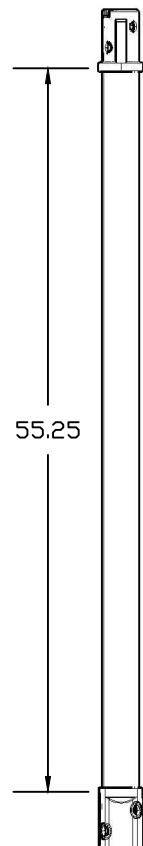
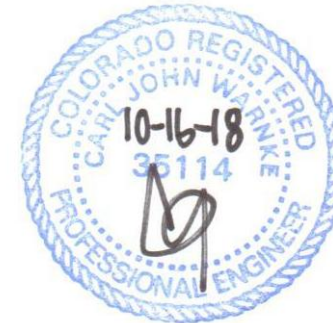
8" X  $\frac{3}{8}$ "  
3" PITCH



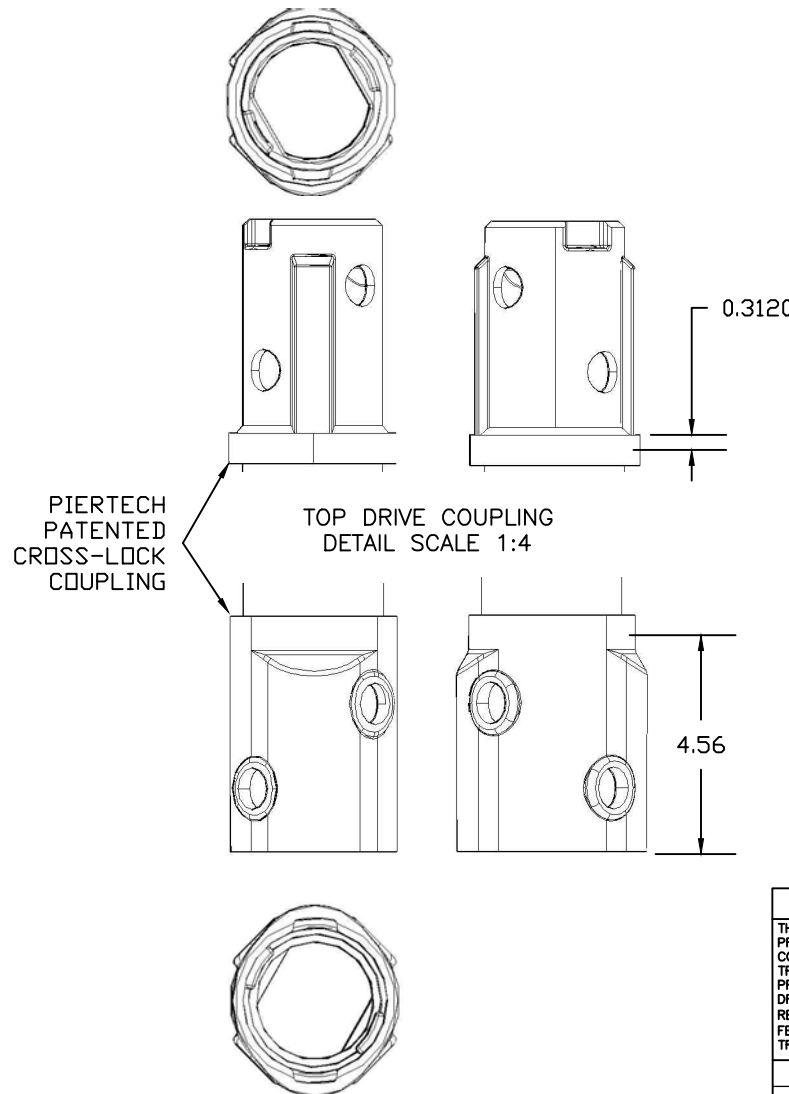
BOTTOM VIEW  
SCALE 1:8

2.875"  
X .217W

REV	DESCRIPTION	DATE	APPROVED



FRONT VIEW  
SCALE 1:16



BOTTOM DRIVE COUPLING  
DETAIL SCALE 1:4

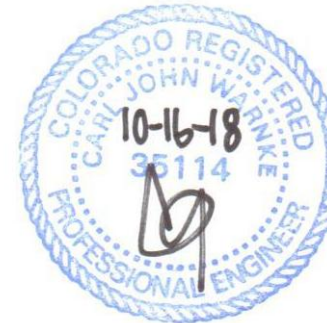
NOTES:

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3.  $\frac{1}{4}$ " FILLET WELD ON EACH COUPLING.
4. SHAFT MATERIAL 60KSI MIN YIELD.
5. FINISH: HOT-DIPPED GALVANIZED PER ASTM A123/153.
6. BOLTS:  $\frac{3}{4}$ " GRADE 5 MIN.
7. RECOMMENDED KT FACTOR = 9 (1/FT).
8. ULTIMATE SHAFT RATING = 100 KIPS
9. ALLOWABLE SHAFT RATING = 50 KIPS
10. ULTIMATE GEOTECHNICAL CAPACITY BASED ON A KT OF 9 (1/FT) = 79.2 KIPS.
11. ULTIMATE TORQUE RATING = 8,800 FT-LBS.

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<p>DRAWN 7/2/15 MW CHECK 7/2/15 NP</p>			<p><b>PierTech</b> SYSTEMS®</p>
<p>E_CL_2.88OD_.217W_5FT_GALV</p>			<p>TOLERANCES UNLESS OTHERWISE SPECIFIED .X ± .1 .XX ± .03 .XXX ± .010 ANGLE ± 1 DEG</p>
SIZE	DWG NO	REV	
A	2.88-E5G	-	
SCALE	VARIES	WEIGHT	40_LBS
		SHEET	1_OF_1



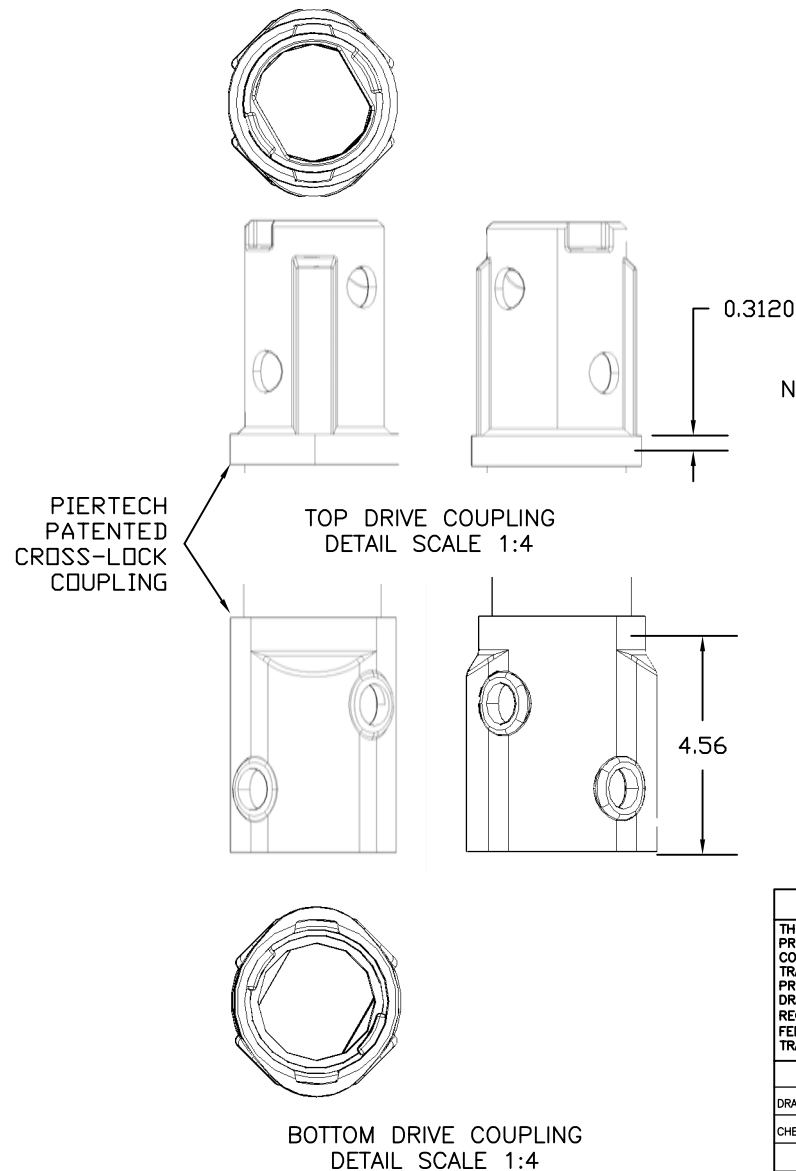
REV	DESCRIPTION	DATE	APPROVED
A	Change L		



NOTES:

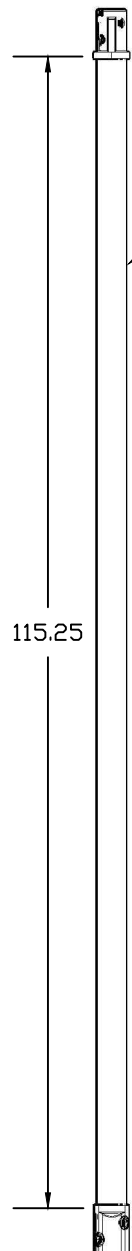
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DRAWN 7/2/15 MW	RS2-7/8CLX.217X7FT_EXTGALV		
CHECK 7/2/15 NP	TOLERANCES UNLESS OTHERWISE SPECIFIED .X ± .1 .XX ± .03 .XXX ± .010 ANGLE ± 1 DEG		
SIZE	DWG NO.	REV	
A	2.88-E7G	A	
SCALE	VARIES	WEIGHT	NA
SHEET		1_OF_1	



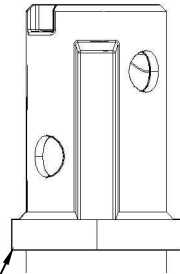
FRONT VIEW  
SCALE 1:16

BOTTOM DRIVE COUPLING  
DETAIL SCALE 1:4

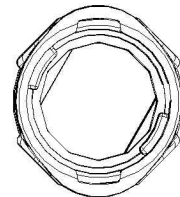
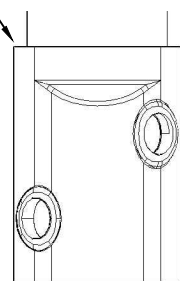


2-7/8"  $\varnothing$ D  
X .217W

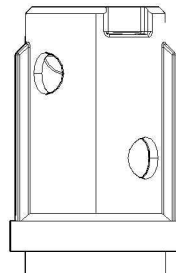
PIERTECH  
PATENTED  
CROSS-LOCK  
COUPLING



TOP DRIVE COUPLING  
DETAIL SCALE 1:4



BOTTOM DRIVE COUPLING  
DETAIL SCALE 1:4



0.31

4.56

FRONT VIEW  
SCALE 1:20

REV	DESCRIPTION	DATE	APPROVED



#### NOTES:

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DRAWN 7/2/15 MW		E_CL_2.88OD_.217W_10FT_GALV	
CHECK 7/2/15 NP		TOLERANCES UNLESS OTHERWISE SPECIFIED .X $\pm$ .1 .XX $\pm$ .03 .XXX $\pm$ .010 ANGLE $\pm$ 1 DEG	
SIZE	DWG NO	REV	
A	2.88-E10G	-	
SCALE	VARIES	WEIGHT	74_LBS
SHEET		1_OF_1	