

Y.J INC. SIGN ENGINEER



January 23, 2019

Structural Calculations

Prepared For:

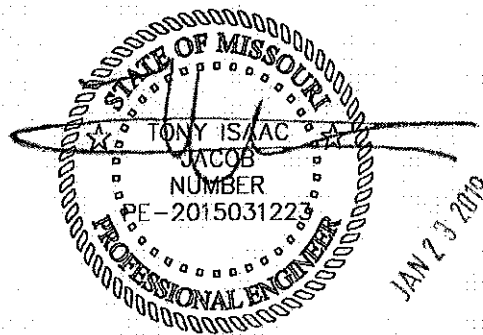
Teksign, Inc.
86 Plant Farm Blvd.
Brantford, Ontario N3S 7W3, Canada

Project:

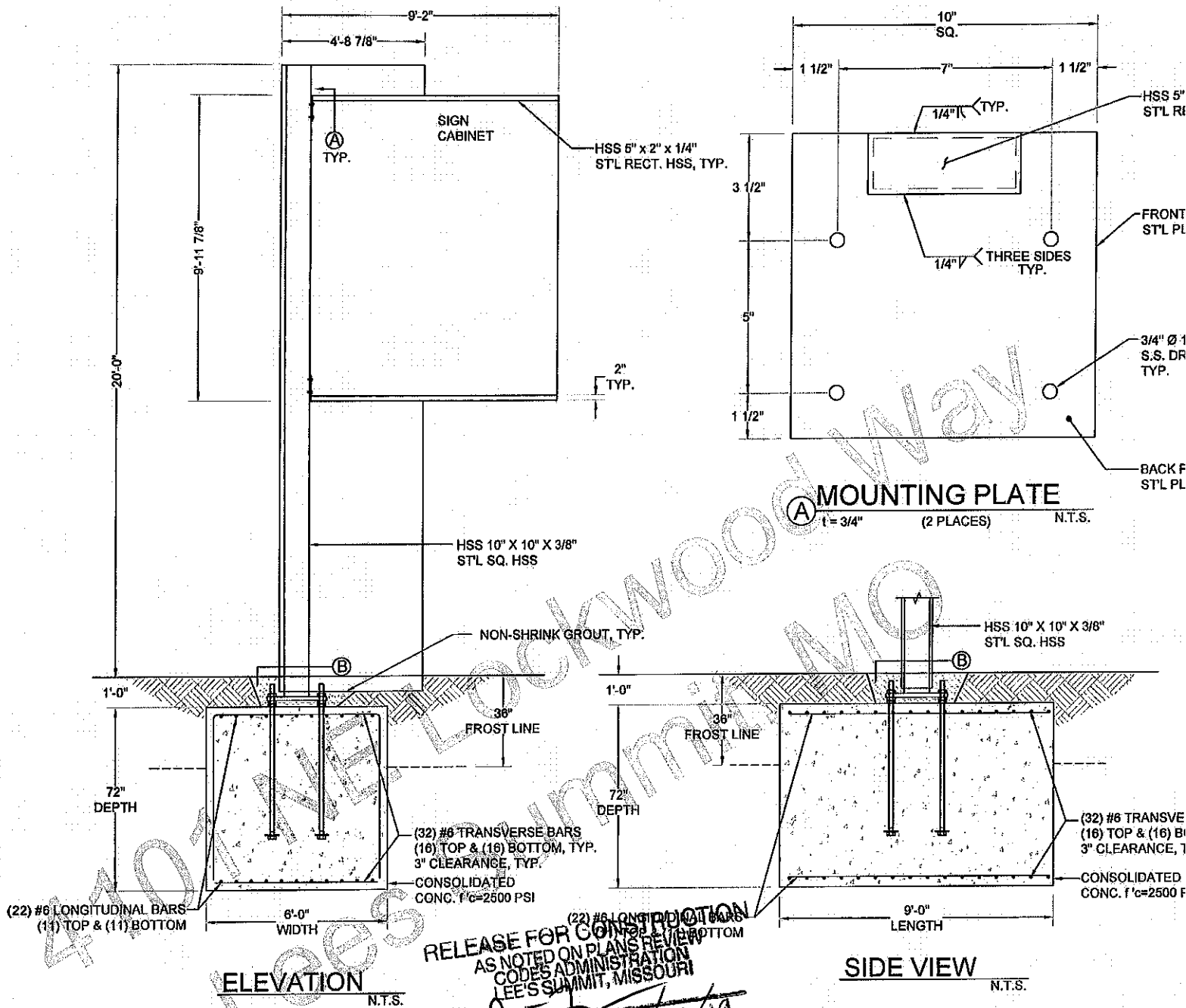
JTS_253218
Coleman Equipment – Pylon
4101 NE Lockwood Way
Lees Summit, MO

Prepared By:

YJ Inc.
P.O. Box 802050
Santa Clarita, CA 91380



Total 5 - pages including cover



RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
CODES ADMINISTRATION
LEE'S SUMMIT, MISSOURI
BY [Signature]
DATE 3/22/19

NOTES :

GENERAL :

- SIGN DESIGN IS BASED ON ADEQUATE EXISTING SUPPORT ELEMENTS.
- PROVIDE ISOLATION OF DISSIMILAR MATERIALS.
- COAT ALUMINUM IN CONTACT WITH CONCRETE WITH ZINC RICH PAINT.
- THERE IS NO PROTECTION ZONE AS DEFINED IN AISC 341-10.
- PROVIDE FULLY WELDED END CAPS AT EXPOSED OPEN ENDS OF STEEL / ALUM. TUBES, MATCH THICKNESS LIKE FOR LIKE.
- SLOPE TOP OF EXPOSED FOOTING AWAY FROM DIRECT BURIAL POSTS

ANCHORS :

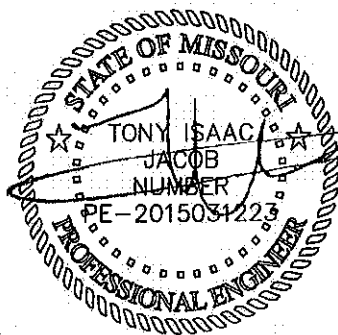
- BRAND NAME APPROVED POST INSTALLED ANCHORS SPECIFIED ON PLANS MAY BE SUBSTITUTED BY APPROVED EQUAL.

STEEL :

- DESIGN AND FABRICATION ACCORDING TO AISC 360-10.
- PLATE, ANGLE, CHANNEL TEE, AND WELDED CONNECTIONS SHALL BE FABRICATED FROM A36 STEEL OR EQUIVALENT.
- ALL ANCHORS BOLTS SHOULD BE: A307 OR EQUIVALENT.
- ALL STEEL MACHINED BOLTS SHOULD BE: A307 OR EQUIVALENT.
- ALL STAINLESS STEEL MACHINED BOLTS SHOULD BE: A307 OR EQUIVALENT.
- ZINC COATED (HOT DIPPED) PER: AIAA 100-100.
- BEARING TYPE CONNECTION REINFORCED WITH 60 DEFORMED BARS

ALUMINUM :

- DESIGN AND FABRICATION ACCORDING TO AISC 360-10.
- PLATES, ANGLES, CHANNELS, TEE, AND WELDED CONNECTIONS SHALL BE FABRICATED FROM 6061-T6 ALLOY 6061-T6 WITH 0.098 LBS PER INCH



1/23/2019



www.yjinc.com
P.O. BOX 802050
SANTA CLARITA, CA. 91380

SHEET TITLE:

**COLEMAN EQUIPMENT
PYLON SIGN**

DRN BY: I
CHK BY:
REV BY:

YJ Inc.
PO Box 802050
Santa Clarita, CA 91380
T. 661-256-0700

Project Title: Coleman Equipment
Engineer: R.G.
Project ID: JTS_253218
Project Descr: Pylon Concrete Footing

Printed: 9 JAN 2019, 10:40AM

General Footing

File = Z:\YJ\SIGN-3\2018\JT-1\253218-1\JTS_253218.ec6
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Licensee : YJ INC.

Lic. # : KW-06009182

Description : Pylon Concrete Footing

Code References

Calculations per ACI 318-11, IBC 2012, CBC 2013, ASCE 7-10

Load Combinations Used : IBC 2012

General Information

Material Properties

f_c : Concrete 28 day strength = 2.50 ksi
 f_y : Rebar Yield = 60.0 ksi
 E_c : Concrete Elastic Modulus = 2,850.0 ksi
Concrete Density = 145.0 pcf
 ϕ Values Flexure = 0.880
Shear = 0.750

Analysis Settings

Min Steel % Bending Reinf. =
Min Allow % Temp Reinf. = 0.00180
Min. Overturning Safety Factor = 1.50 : 1
Min. Sliding Safety Factor = 1.50 : 1
Add Ftg Wt for Soil Pressure : Yes
Use ftg wt for stability, moments & shears : Yes
Add Pedestal Wt for Soil Pressure : Yes
Use Pedestal wt for stability, mom & shear : Yes

Soil Design Values

Allowable Soil Bearing = 1.50 ksf
Increase Bearing By Footing Weight = Yes
Soil Passive Resistance (for Sliding) = 240.0 pcf
Soil/Concrete Friction Coeff. = 0.320

Increases based on footing Depth

Footing base depth below soil surface = 7.0 ft
Allow press. increase per foot of depth when footing base is below = ksf ft

Increases based on footing plan dimension

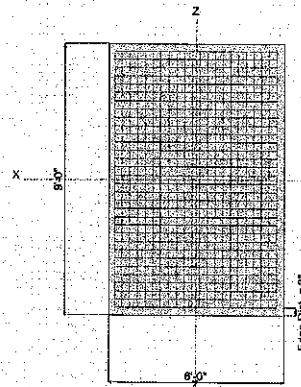
Allowable pressure increase per foot of depth when max. length or width is greater than = ksf ft

Dimensions

Width parallel to X-X Axis = 6.0 ft
Length parallel to Z-Z Axis = 9.0 ft
Footing Thickness = 72.0 in

Pedestal dimensions...

px : parallel to X-X Axis = in
pz : parallel to Z-Z Axis = in
Height = in
Rebar Centerline to Edge of Concrete... at Bottom of footing = 3.0 in



Reinforcing

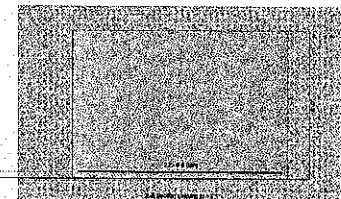
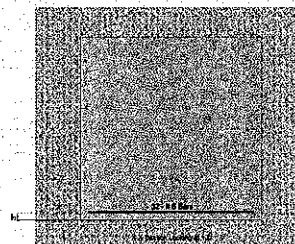
Bars parallel to X-X Axis
Number of Bars = 32.0
Reinforcing Bar Size = # 6
Bars parallel to Z-Z Axis
Number of Bars = 22.0
Reinforcing Bar Size = # 6

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

Bars along X-X Axis

Bars required within zone = 80.0 %
Bars required on each side of zone = 20.0 %



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	1.380					k
OB : Overburden	=						ksf
M-xx	=				56.930		k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=				5.052		k

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General Footing

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Licensee: YJ INC.

Description: Pylon Concrete Footing

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.6477	Soil Bearing	1.535 ksf	2.370 ksf	+D-0.60W about X-X axis
PASS	2.494	Overturning - X-X	52.345 k-ft	130.572 k-ft	+0.60D+0.60W
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	14.465	Sliding - Z-Z	3.031 k	43.845 k	+0.60D+0.60W
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.000348	Z Flexure (+X)	0.1610 k-ft/ft	462.296 k-ft/ft	+1.40D
PASS	0.000348	Z Flexure (-X)	0.1610 k-ft/ft	462.296 k-ft/ft	+1.40D
PASS	0.01629	X Flexure (+Z)	7.761 k-ft/ft	476.334 k-ft/ft	+0.90D+W
PASS	0.01629	X Flexure (-Z)	7.761 k-ft/ft	476.334 k-ft/ft	+0.90D-W
PASS	n/a	1-way Shear (+X)	0.0 psi	75.0 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a
PASS	n/a	1-way Shear (+Z)	0.0 psi	75.0 psi	n/a
PASS	n/a	1-way Shear (-Z)	0.0 psi	75.0 psi	n/a
PASS	n/a	2-way Punching	0.08251 psi	75.0 psi	+0.90D-W

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Zecc (in)	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	2.370	n/a	0.0	0.8956	0.8956	n/a	n/a	0.378
X-X, +D+0.60W	2.370	n/a	12.989	0.2558	1.535	n/a	n/a	0.648
X-X, +D-0.60W	2.370	n/a	-12.989	1.535	0.2558	n/a	n/a	0.648
X-X, +D+0.450W	2.370	n/a	9.742	0.4157	1.375	n/a	n/a	0.580
X-X, +D-0.450W	2.370	n/a	-9.742	1.375	0.4157	n/a	n/a	0.580
X-X, +0.60D+0.60W	2.370	n/a	21.648	0.0	1.189	n/a	n/a	0.502
X-X, +0.60D-0.60W	2.370	n/a	-21.648	1.189	0.0	n/a	n/a	0.502
X-X, +0.60D	2.370	n/a	0.0	0.5373	0.5373	n/a	n/a	0.227
Z-Z, D Only	2.370	0.0	n/a	n/a	n/a	0.8956	0.8956	0.378
Z-Z, +D+0.60W	2.370	0.0	n/a	n/a	n/a	0.8956	0.8956	0.378
Z-Z, +D-0.60W	2.370	0.0	n/a	n/a	n/a	0.8956	0.8956	0.378
Z-Z, +D+0.450W	2.370	0.0	n/a	n/a	n/a	0.8956	0.8956	0.378
Z-Z, +D-0.450W	2.370	0.0	n/a	n/a	n/a	0.8956	0.8956	0.378
Z-Z, +0.60D+0.60W	2.370	0.0	n/a	n/a	n/a	0.5373	0.5373	0.227
Z-Z, +0.60D-0.60W	2.370	0.0	n/a	n/a	n/a	0.5373	0.5373	0.227
Z-Z, +0.60D	2.370	0.0	n/a	n/a	n/a	0.5373	0.5373	0.227

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
X-X, D Only	None	0.0 k-ft	Infinity	OK
X-X, +D+0.60W	52.345 k-ft	217.620 k-ft	4.157	OK
X-X, +D+0.450W	39.259 k-ft	217.620 k-ft	5.543	OK
X-X, +0.60D+0.60W	52.345 k-ft	130.572 k-ft	2.494	OK
X-X, +0.60D	None	0.0 k-ft	Infinity	OK
Z-Z, D Only	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.60W	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.450W	None	0.0 k-ft	Infinity	OK
Z-Z, +0.60D+0.60W	None	0.0 k-ft	Infinity	OK
Z-Z, +0.60D	None	0.0 k-ft	Infinity	OK

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
X-X, D Only	0.0 k	67.315 k	No Sliding	OK
X-X, +D+0.60W	0.0 k	67.315 k	No Sliding	OK
X-X, +D+0.450W	0.0 k	67.315 k	No Sliding	OK
X-X, +0.60D+0.60W	0.0 k	61.125 k	No Sliding	OK
X-X, +0.60D	0.0 k	61.125 k	No Sliding	OK

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General Footing

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Licensee: YJ INC.

Description: Pylon Concrete Footing

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Z-Z, D Only	0.0 k	50.035 k	No Sliding	OK
Z-Z, +D+0.60W	3.031 k	50.035 k	16.507	OK
Z-Z, +D+0.450W	2.273 k	50.035 k	22.009	OK
Z-Z, +0.60D+0.60W	3.031 k	43.845 k	14.465	OK
Z-Z, +0.60D	0.0 k	43.845 k	No Sliding	OK

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in ²	Gvrn. As in ²	Actual As in ²	Phi*Mn k-ft	Status
X-X, +1.40D	0.3623	+Z	Bottom	1.555	Min Temp %	1.613	476.334	OK
X-X, +1.40D	0.3623	-Z	Bottom	1.555	Min Temp %	1.613	476.334	OK
X-X, +1.20D+0.50W	3.945	+Z	Bottom	1.555	Min Temp %	1.613	476.334	OK
X-X, +1.20D+0.50W	3.324	-Z	Top	1.555	Min Temp %	1.613	476.334	OK
X-X, +1.20D-0.50W	3.324	+Z	Top	1.555	Min Temp %	1.613	476.334	OK
X-X, +1.20D-0.50W	3.945	-Z	Bottom	1.555	Min Temp %	1.613	476.334	OK
X-X, +1.20D+W	7.580	+Z	Bottom	1.555	Min Temp %	1.613	476.334	OK
X-X, +1.20D+W	6.959	-Z	Top	1.555	Min Temp %	1.613	476.334	OK
X-X, +1.20D-W	6.959	+Z	Top	1.555	Min Temp %	1.613	476.334	OK
X-X, +1.20D-W	7.580	-Z	Bottom	1.555	Min Temp %	1.613	476.334	OK
X-X, +0.90D+W	7.761	+Z	Bottom	1.555	Min Temp %	1.613	476.334	OK
X-X, +0.90D+W	6.778	-Z	Top	1.555	Min Temp %	1.613	476.334	OK
X-X, +0.90D-W	6.778	+Z	Top	1.555	Min Temp %	1.613	476.334	OK
X-X, +0.90D-W	7.761	-Z	Bottom	1.555	Min Temp %	1.613	476.334	OK
Z-Z, +1.40D	0.1610	-X	Bottom	1.555	Min Temp %	1.564	462.296	OK
Z-Z, +1.40D	0.1610	+X	Bottom	1.555	Min Temp %	1.564	462.296	OK
Z-Z, +1.20D+0.50W	0.1380	-X	Bottom	1.555	Min Temp %	1.564	462.296	OK
Z-Z, +1.20D+0.50W	0.1380	+X	Bottom	1.555	Min Temp %	1.564	462.296	OK
Z-Z, +1.20D-0.50W	0.1380	-X	Bottom	1.555	Min Temp %	1.564	462.296	OK
Z-Z, +1.20D-0.50W	0.1380	+X	Bottom	1.555	Min Temp %	1.564	462.296	OK
Z-Z, +1.20D+W	0.1380	-X	Bottom	1.555	Min Temp %	1.564	462.296	OK
Z-Z, +1.20D+W	0.1380	+X	Bottom	1.555	Min Temp %	1.564	462.296	OK
Z-Z, +1.20D-W	0.1380	-X	Bottom	1.555	Min Temp %	1.564	462.296	OK
Z-Z, +1.20D-W	0.1380	+X	Bottom	1.555	Min Temp %	1.564	462.296	OK
Z-Z, +0.90D+W	0.1035	-X	Bottom	1.555	Min Temp %	1.564	462.296	OK
Z-Z, +0.90D+W	0.1035	+X	Bottom	1.555	Min Temp %	1.564	462.296	OK
Z-Z, +0.90D-W	0.1035	-X	Bottom	1.555	Min Temp %	1.564	462.296	OK
Z-Z, +0.90D-W	0.1035	+X	Bottom	1.555	Min Temp %	1.564	462.296	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D-0.50W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D-W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+0.90D+W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+0.90D-W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	0.04 psi	150.00psi	0.000261	OK
+1.20D+0.50W	0.03 psi	150.00psi	0.000224	OK
+1.20D-0.50W	0.03 psi	150.00psi	0.000224	OK
+1.20D+W	0.03 psi	150.00psi	0.000224	OK
+1.20D-W	0.03 psi	150.00psi	0.000224	OK
+0.90D+W	0.08 psi	150.00psi	0.00055	OK
+0.90D-W	0.08 psi	150.00psi	0.00055	OK