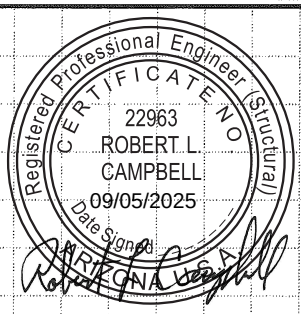
Campbell STRUCTURAL
200 E. 16th St., Suite 100
Yuma, AZ 85364
(928) 726-2646

JOB SOMERTON LIBRARY 25073
SHEET NO. 1 OF 6
CALCULATED BY RLC DATE 9/2025
CHECKED BY DATE
SCALE

Yuma County Somerton Library
HVAC Replacement
240 Canal Street
Somerton, AZ 85350

Client:

Sternco Engineers, Inc.
202 S. 1st Ave., Suite 205
Yuma, AZ 85364



Structural calculations for vertical support and seismic restraint at the new suspended fan coil units.

SEISMIC FORCES

$S_{DS} = 0.53$
$a_p = 2.5$
$R_p = 2.5$
$\Omega_0 = 2.0$
} SUSPENDED VIBRATION ISOLATED

$$F_p = \frac{0.4(2.5)(0.53)W_p(3)(1.0)}{2.5}$$

$F_p = 0.64 k W_p$ ⇐ GOVERNS

$F_{p\,min} = 0.3(0.53)(1.0)W_p = 0.16 k W_p$

MAX FAN COIL = 250#

$F_p = 0.64(250) = 160^{\#}$

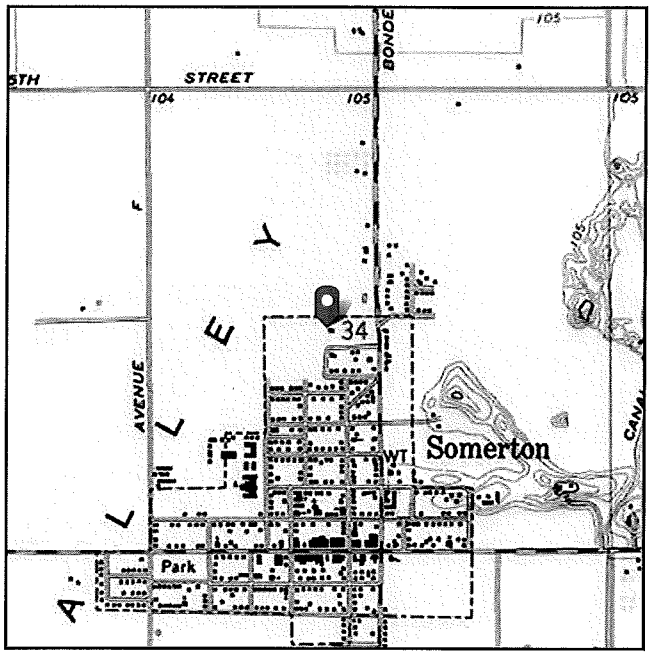
2

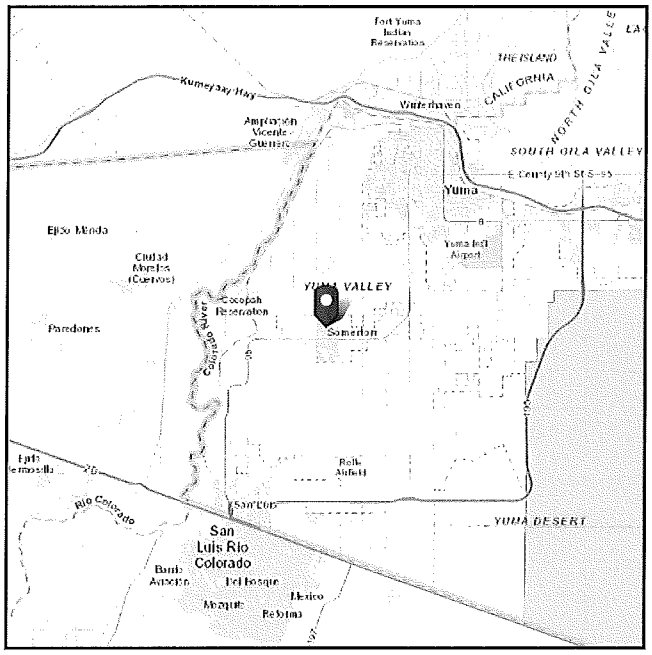
ASCE Hazards Report

Address:
Yuma County Somerton Library - 240 West Canal Street
Somerton,

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Latitude: 32.6035
Longitude: -114.7119
Elevation: 106.31059751611224 ft (NAVD 88)





ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	0.609	S_{D1} :	N/A
S_1 :	0.261	T_L :	8
F_a :	1.313	PGA :	0.256
F_v :	N/A	PGA_M :	0.345
S_{MS} :	0.8	F_{PGA} :	1.344
S_{M1} :	N/A	I_e :	1
S_{DS} :	0.533	C_v :	1.105

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Thu Sep 04 2025

Date Source: USGS Seismic Design Maps

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JOB 25073 SOMERTON LIB. HVAC
SHEET NO. 4 OF
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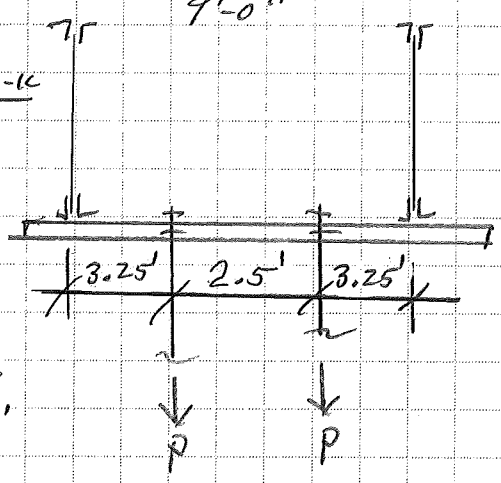
UNISTRUT BETWEEN JOIST

$P = 250\left(\frac{1}{4}\right)(1.15) = 72$ SAY 80#

$M = 80(3.25) = 0.26^{\text{FT-K}} = 3.12^{\text{IN-K}}$



UNISTRUT P1000

$M_{allow} = 14.36^{\text{IN-K}} = 1.20^{\text{FT-K}}$

$DCR = \frac{3.12}{14.36} = 0.22 < 1.0$ O.K.

$\Delta = \frac{Pa}{24EI}\left(3\ell^2 - 4a^2\right)$

$\Delta = \frac{0.08(42)\left[3(108)^2 - 4(42)^2\right]}{24(29\times10^3)(0.928)} = 0.15^{\text{IN}} \quad \frac{\ell}{743}$ O.K.

USE: UNISTRUT P1001 - TWO PER UNIT

Channel Selection Chart

Channel	Channel Dimensions: Width In (mm)	Channel Dimensions: Height In (mm)	Material & Thickness: Steel gauge	Material & Thickness: Stainless Steel gauge	Material & Thickness: Alum. In (mm)	Hole Pattern Styles: HS	T	WT	KO	SL	DS	H3
									Steel Only			
P1000	1⅝ (41.3)	1⅝ (41.3)	12 ga	12 ga	0.109 (2.8)	■	■	■	■	■	■	■
P1100	1⅝ (41.3)	1⅝ (41.3)	14 ga	14 ga	—	■	■	■	■	■	–	–
P2000	1⅝ (41.3)	1⅝ (41.3)	16 ga	—	—	■	■	■	■	■	–	–
P3000	1⅝ (41.3)	1⅜ (34.9)	12 ga	—	—	■	■	■	■	■	–	–
P3300	1⅝ (41.3)	⅞ (22.2)	12 ga	12 ga	—	■	■	■	–	■	–	–
P4000	1⅝ (41.3)	13/16 (20.6)	16 ga	16 ga	0.078 (2.0)	■	■	■	–	■	–	–
P4100	1⅝ (41.3)	13/16 (20.6)	14 ga	—	—	■	■	■	–	■	–	–
P4400	1⅝ (41.3)	1(25.4)	12 ga	—	—	■	■	■	–	■	–	–
P4520	1⅝ (41.3)	13/16 (20.6)	12 ga	—	—	■	■	■	–	■	–	–
P5000	1⅝ (41.3)	3¼ (82.6)	12 ga	12 ga	—	■	■	■	■	■	–	–
P5500	1⅝ (41.3)	2 1/16 (61.9)	12 ga	—	0.109 (2.8)	■	■	■	■	■	–	–

Channels & Combinations in Descending Order of Strength

Channel	Area In² (cm²)	Weight lbs/ft (kg/m)	I In⁴ (cm⁴)	s In³(cm³)	Allow. Moment In-lbs (N•m)
P5001	1.793	6.10	6.227	1.916	48,180
	11.57	*9.1*	*259.2*	*31.4*	*5,440*
P1004A	1.965	6.68	4.068	1.669	41,980
	12.68	*9.9*	*169.3*	*27.4*	*4,740*
P5501	1.452	4.94	2.805	1.151	28,940
	9.37	*7.3*	*116.8*	*18.9*	*3,270*
P1001C41	2.221	7.55	1.856	1.142	28,720
	14.33	*11.2*	*77.2*	*18.7*	*3,250*
P5000	0.897	3.05	1.098	0.627	15,770
	5.78	*4.5*	*45.7*	*10.3*	*1,780*
P1001	1.111	3.78	0.928	0.571	14,360
	7.16	*5.6*	*38.6*	*9.4*	*1,620*
P1101	0.835	2.84	0.733	0.451	11,340
	5.39	*4.2*	*30.5*	*7.4*	*1,280*
P3001	1.000	3.40	0.591	0.430	10,810
	6.45	*5.1*	*24.6*	*7.0*	*1,220*
P5500	0.726	2.47	0.522	0.390	9,820
	4.68	*3.7*	*21.7*	*6.4*	*1,110*
P2001	0.684	2.32	0.618	0.381	9,570
	4.41	*3.5*	*25.7*	*6.2*	*1,080*
P9200	0.489	2.23	0.279	0.297	7,480
	3.16	*3.3*	*11.6*	*4.9*	*850*
P4401	0.849	5.77	0.26	0.26	6,410
	5.48	*8.5*	*10.6*	*4.2*	*725*
A1001	0.609	2.07	0.302	0.242	6,070
	3.93	*3.1*	*12.6*	*4.0*	*690*
P9000	0.387	1.88	0.166	0.205	5,150
	2.50	*2.8*	*6.9*	*3.4*	*580*
P1000	0.555	1.89	0.185	0.202	5,070
	3.58	*2.8*	*7.7*	*3.3*	*570*
P3301	0.790	2.69	0.176	0.201	5,060
	5.10	*4.0*	*7.3*	*3.3*	*570*
P4521	0.77	2.62	0.15	0.18	4,538
	4.97	*3.9*	*6.1*	*2.9*	*513*

Channel	Area In² (cm²)	Weight lbs/ft (kg/m)	I In⁴ (cm⁴)	s In³(cm³)	Allow. Moment In-lbs (N•m)
P1100	0.418	1.42	0.145	0.162	4,060
	2.69	*2.1*	*6.0*	*2.6*	*460*
P3000	0.500	1.70	0.120	0.153	3,850
	3.23	*2.5*	*5.0*	*2.5*	*430*
P4101	0.579	1.97	0.117	0.143	3,610
	3.74	*2.9*	*4.9*	*2.4*	*410*
P2000	0.342	1.16	0.125	0.140	3,520
	2.21	*1.7*	*5.2*	*2.3*	*400*
P4001	0.478	1.66	0.104	0.128	3,210
	3.14	*2.5*	*4.3*	*2.1*	*360*
A3301	0.459	1.56	0.077	0.103	2,590
	2.96	*2.3*	*3.2*	*1.7*	*290*
P4400	0.424	2.89	0.053	0.092	2,300
	2.74	*4.3*	*2.2*	*1.5*	*260*
A1000	0.305	1.04	0.061	0.086	2,170
	1.96	*1.5*	*2.5*	*1.4*	*250*
P3300	0.395	1.34	0.037	0.072	1,800
	2.55	*2.0*	*1.5*	*1.2*	*200*
P4520	0.384	1.31	0.031	0.064	1,615
	2.48	*1.9*	*1.3*	*1.0*	*183*
A4001	0.264	0.90	0.037	0.058	1,470
	1.70	*1.3*	*1.5*	*1.0*	*170*
P6001	0.213	0.73	0.045	0.055	1,400
	1.38	*1.1*	*1.9*	*0.9*	*160*
P4100	0.290	0.98	0.026	0.054	1,360
	1.87	*1.5*	*1.1*	*0.9*	*150*
P4000	0.244	0.83	0.023	0.049	1,230
	1.57	*1.2*	*0.9*	*0.8*	*140*
A3300	0.230	0.78	0.017	0.038	950
	1.48	*1.2*	*0.7*	*0.6*	*110*
P6000	0.107	0.36	0.009	0.020	510
	0.69	*0.5*	*0.4*	*0.3*	*60*
P7001	0.148	0.50	0.007	0.018	460
	0.96	*0.8*	*0.3*	*0.3*	*50*
P7000	0.074	0.25	0.002	0.007	170
	0.48	*0.4*	*0.1*	*0.1*	*20*

Combinations not shown in catalog are available on special order.
Consult factory for more details.

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SHEET NO. 6 OF 6
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SEISMIC BRACING CABLE

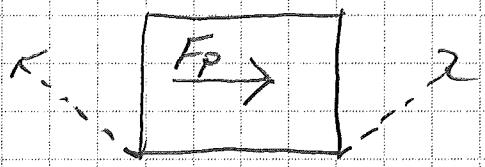
$F_p = 160^{\#}$

FORCE PER CABLE

$T_U = 160\left(\frac{1}{2}\right)(1.41)(1.41)$

$T_U = 160^{\#}$/CABLE

$T_{ASD} = 0.7(160) = 112^{\#}$



USE: 1/8" Φ 7X19 WIRE ROPE

$T_{allow} = 400^{\#}$ WORKING LOAD

$DCR = \frac{112}{400} = 0.28$