TM RIPPEY
CONSULTING ENGINEERS

7650 SW Beveland St
Suite 100
Tigard, Oregon 97223
Phone: (503) 443-3900
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SUPPLEMENTAL CALCULATIONS

FOR

Ankrom Moisan Architecture

KOIN Tower RVK – TI
222 SW Columbia St, Portland, OR 97201

TMR # 23250

EXPIRES: 6–30–24

December 7, 2023

INTERIOR PARTITION WALL WIRE BRACING

PARTIAL WALL HEIGHT = 9'-0"
LIVE TRIB = 4'-6"
LIVE LOAD PER FOOT = 5PSF (4.5') = 22.5 PLF
TENSION ON CABLE @ 45° = 32.8 PLF

CABLE CAPACITY W/ (3) WRAPS = 270# (12GA MIN)
MAX CABLE SPACING = 270# / 32.8PLF = 8.48'

⇒ use splay wires @ 4'-0" o/c w/ 45° every other side (max)

CONNECTION TO DECK

use 1/4" eyehook screws (NOT USED)

RELIES ON DECK ONLY

SCREW CAPACITY IN 20GA DECK:
SHEAR = 127#
PULLOUT = 73#

NOT USED

SCREW UTILIZATION:

$$\frac{22.5\,PLF\,(\ell)}{127\#} + \frac{22.5\,PLF\,(\ell)}{73\#} \leq 1.0 \;\therefore\; \ell_{MAX} = 2.06'$$

⇒ use 1/4" eyehook screws @ every 2'-0" max

use simpson 'PDPA' fasteners w/ cable eyelet

RELIES ON CONC. ONLY

PDPA CAPACITY IN 4000PSI CONCRETE:
SHEAR = 310#
TENSION = 310#

PDPA UTILIZATION:

$$\frac{22.5\,(\ell)}{310\#} + \frac{22.5\,(\ell)}{310\#} \leq 1.0 \;\therefore\; \ell_{MAX} = 6.88'$$

⇒ use 0.157" ϕ x 1 1/4" PDPA @ 4'-0" max o/c

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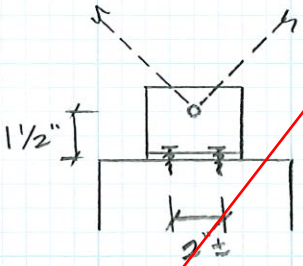
KOIN TWR

BY KES DATE
CHK BY DATE
JOB NO
SHEET C12 OF

CONNECTION TO TRACK



min QTY screws to top track

SCREW CAPACITY:

SHEAR = 103#

PULLOUT = 48#

QTY OF SCREWS REQ'D PER CLIP:

$$\frac{22.5\text{PLF}(4')}{103\#(x)} + \frac{22.5\text{PLF}(4')}{48\#(x)} \leq 1.0 \;\therefore\; x = 2.75$$

⇒ use min (4) #8 screws per clip to track

min clip GA for wire connection

SCREW CAPACITY:

SHEAR = 302#

PULLOUT = 144#

NOT USED

SCREW UTILIZATION:

$$\frac{22.5\text{PLF}(4')}{302\#} + \frac{22.5\text{PLF}(4')}{144\#} = 0.923 \leq 1.0 \;\therefore\; \text{OK}$$

⇒ use ¼" ϕ screw w/ min 43 mil clip

check 20 GA track @ 4'-0" o/c bracing

20 GA TRACK CAPACITY:

M_{ALLOW} = 3.44 k·in (assumed)

TRACK UTILIZATION:

$$\frac{22.5\#\cdot\text{FT}}{M_{ALLOW}} = 0.078 \leq 1.0 \;\therefore\; \text{20GA TRACK OK}$$

check overturning on connection

$$\frac{22.5\#(4')}{127\#(4)} + \frac{22.5\#(4')}{73\#(4)} + \frac{22.5\#(4')(1\frac{1}{2}"/2")}{73\#(2)} = 0.948 \leq 1.0 \;\therefore$$

increase #8's to (4) ¼" ϕ screws.

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JOB NO 23250

SHEET C13 OF

Track (T) Section Properties

Table Notes

1. The centerline bend radius is based on inside corner radii shown in the steel thickness table on page 5.
2. Web depth for track sections is equal to the nominal height plus 2 times the design thickness plus the bend radius.
3. Hems on nonstructural track sections are ignored. Not all track members are hemmed.
4. Effective properties incorporate the strength increase from the cold work of forming as applicable per AISI S100 Section A7.2.
5. For deflection calculations, use the effective moment of inertia.
6. Based on ASTM C645, 18, and 30 mil track material is considered nonstructural.
7. See page 5 for additional table notes.

Section	Design Thickness (in)	Fy (ksi)	Gross Properties							Effective Properties				Torsional Properties					
			Area (in^2)	Weight (lb/ft)	Ix (in^4)	Sx (in^3)	Rx (in)	Iy (in^4)	Ry (in)	Ixe (in^4)	Sxe (in^3)	Ma (in-k)	Vag (lb)	Jx1000 (in^4)	Cw (in^6)	Xo (in)	m (in)	Ro (in)	ß
162T125-18	0.0188	33	0.077	0.26	0.041	0.047	0.733	0.013	0.411	0.030	0.025	0.50	302	0.009	0.007	-0.878	0.503	1.215	0.478
162T125-30	0.0312	33	0.129	0.44	0.070	0.079	0.735	0.022	0.409	0.057	0.050	1.00	597	0.042	0.012	-0.870	0.500	1.210	0.483
162T125-33	0.0346	33	0.143	0.49	0.077	0.087	0.736	0.024	0.408	0.066	0.058	1.15	663	0.057	0.013	-0.868	0.499	1.209	0.484
250T125-18	0.0188	33	0.094	0.32	0.103	0.079	1.051	0.015	0.400	0.078	0.045	0.90	249	0.011	0.018	-0.769	0.460	1.362	0.681
250T125-30	0.0312	33	0.156	0.53	0.173	0.131	1.053	0.025	0.397	0.145	0.090	1.77	832	0.051	0.030	-0.762	0.456	1.359	0.686
250T125-33	0.0346	33	0.173	0.59	0.192	0.145	1.054	0.027	0.397	0.166	0.103	2.03	1024	0.069	0.033	-0.760	0.456	1.358	0.687
250T125-43	0.0451	33	0.225	0.77	0.250	0.188	1.055	0.035	0.395	0.231	0.147	2.91	1356	0.153	0.042	-0.755	0.453	1.356	0.690
250T125-54	0.0566	50	0.282	0.96	0.318	0.236	1.062	0.043	0.392	0.297	0.188	5.64	2563	0.301	0.054	-0.749	0.449	1.357	0.696
250T125-68	0.0713	50	0.355	1.21	0.408	0.297	1.072	0.054	0.389	0.402	0.262	7.85	3199	0.602	0.069	-0.740	0.444	1.360	0.704
250T125-97	0.1017	50	0.506	1.72	0.604	0.423	1.092	0.074	0.383	0.604	0.423	12.67	4476	1.745	0.101	-0.724	0.434	1.365	0.719
250T150-30	0.0312	33	0.172	0.58	0.199	0.151	1.078	0.040	0.486	0.157	0.093	1.83	832	0.056	0.049	-0.975	0.574	1.533	0.595
250T150-33	0.0346	33	0.190	0.65	0.221	0.167	1.079	0.045	0.485	0.179	0.107	2.11	1024	0.076	0.054	-0.973	0.573	1.532	0.596
250T150-43	0.0451	33	0.248	0.84	0.289	0.217	1.080	0.058	0.483	0.252	0.154	3.03	1356	0.168	0.070	-0.968	0.570	1.529	0.599
250T150-54	0.0566	50	0.311	1.06	0.368	0.273	1.088	0.072	0.481	0.325	0.197	5.89	2563	0.332	0.089	-0.961	0.566	1.529	0.605
250T150-68	0.0713	50	0.391	1.33	0.472	0.344	1.099	0.089	0.478	0.445	0.276	8.27	3199	0.663	0.114	-0.953	0.561	1.531	0.613
250T150-97	0.1017	50	0.557	1.9	0.701	0.491	1.121	0.124	0.471	0.701	0.463	13.86	4476	1.921	0.168	-0.935	0.55	1.534	0.629
250T200-33	0.0346	33	0.225	0.76	0.280	0.212	1.117	0.097	0.658	0.203	0.112	2.22	1024	0.090	0.118	-1.418	0.813	1.921	0.455
250T200-43	0.0451	33	0.293	1.00	0.366	0.275	1.118	0.126	0.657	0.288	0.163	3.21	1356	0.198	0.153	-1.413	0.810	1.918	0.457
250T200-54	0.0566	50	0.367	1.25	0.466	0.346	1.127	0.157	0.654	0.371	0.209	6.25	2563	0.392	0.195	-1.405	0.806	1.917	0.462
250T200-68	0.0713	50	0.462	1.57	0.600	0.437	1.139	0.196	0.652	0.517	0.296	8.86	3199	0.783	0.251	-1.396	0.800	1.916	0.469
250T200-97	0.1017	50	0.659	2.24	0.893	0.626	1.165	0.275	0.646	0.856	0.51	15.27	4476	2.271	0.374	-1.376	0.789	1.915	0.484
350T125-18	0.0188	33	0.113	0.38	0.219	0.121	1.394	0.016	0.383	0.174	0.063	1.25	175	0.013	0.038	-0.675	0.418	1.595	0.821
350T125-30	0.0312	33	0.187	0.64	0.365	0.200	1.396	0.027	0.380	0.312	0.145	2.86	790	0.061	0.063	-0.669	0.415	1.594	0.824
350T125-33	0.0346	33	0.207	0.71	0.405	0.222	1.397	0.030	0.379	0.354	0.165	3.27	1024	0.083	0.070	-0.668	0.414	1.594	0.824
350T125-43	0.0451	33	0.270	0.92	0.528	0.288	1.397	0.038	0.377	0.490	0.233	4.61	1739	0.183	0.090	-0.663	0.412	1.592	0.826
350T125-54	0.0566	50	0.339	1.15	0.668	0.361	1.404	0.048	0.375	0.626	0.297	8.89	3372	0.362	0.114	-0.658	0.408	1.595	0.830
350T125-68	0.0713	50	0.427	1.45	0.851	0.454	1.412	0.0	NOT USED	9	0.407	12.18	4536	0.723	0.144	-0.650	0.403	1.599	0.835
350T125-97	0.1017	50	0.608	2.07	1.243	0.645	1.43	0.0		3	0.645	19.3	6383	2.096	0.209	-0.636	0.394	1.607	0.844
350T150-30	0.0312	33	0.203	0.69	0.416	0.228	1.432	0.045	0.469	0.336	0.150	2.96	790	0.066	0.103	-0.867	0.528	1.739	0.751
350T150-33	0.0346	33	0.225	0.76	0.461	0.253	1.432	0.049	0.469	0.382	0.171	3.39	1024	0.090	0.114	-0.866	0.527	1.738	0.752
350T150-43	0.0451	33	0.293	1.00	0.601	0.328	1.433	0.064	0.467	0.531	0.243	4.80	1739	0.198	0.148	-0.861	0.525	1.736	0.754
350T150-54	0.0566	50	0.367	1.25	0.761	0.412	1.440	0.079	0.465	0.679	0.310	9.28	3372	0.392	0.187	-0.855	0.521	1.738	0.758
350T150-68	0.0713	50	0.462	1.57	0.972	0.518	1.450	0.099	0.462	0.919	0.428	12.81	4536	0.783	0.238	-0.847	0.516	1.741	0.763
350T150-97	0.1017	50	0.659	2.24	1.422	0.738	1.469	0.136	0.455	1.422	0.701	20.98	6383	2.271	0.346	-0.831	0.506	1.748	0.774
350T200-33	0.0346	33	0.259	0.88	0.574	0.315	1.487	0.108	0.647	0.428	0.181	3.57	1024	0.103	0.249	-1.285	0.761	2.069	0.614
350T200-43	0.0451	33	0.338	1.15	0.749	0.409	1.489	0.140	0.645	0.600	0.257	5.09	1739	0.229	0.323	-1.280	0.758	2.066	0.616
350T200-54	0.0566	50	0.424	1.44	0.949	0.513	1.496	0.175	0.642	0.770	0.329	9.85	3372	0.453	0.409	-1.273	0.754	2.067	0.621
350T200-68	0.0713	50	0.534	1.82	1.213	0.647	1.508	0.218	0.639	1.054	0.458	13.71	4536	0.904	0.522	-1.264	0.749	2.069	0.626
350T200-97	0.1017	50	0.761	2.59	1.78	0.923	1.53	0.305	0.633	1.708	0.769	23.01	6383	2.622	0.765	-1.247	0.738	2.073	0.638
350T250-43	0.0451	33	0.383	1.30	0.896	0.490	1.530	0.257	0.819	0.659	0.268	5.29	1739	0.260	0.593	-1.719	0.996	2.443	0.505
350T250-54	0.0566	50	0.480	1.63	1.137	0.615	1.538	0.321	0.817	0.846	0.343	10.26	3372	0.513	0.752	-1.712	0.992	2.442	0.509
350T250-68	0.0713	50	0.605	2.06	1.454	0.776	1.550	0.401	0.814	1.168	0.479	14.35	4536	1.025	0.961	-1.703	0.987	2.443	0.514
350T250-97	0.1017	50	0.862	2.93	2.139	1.109	1.575	0.563	0.808	1.924	0.815	24.39	6383	2.973	1.413	-1.684	0.975	2.443	0.525
362T125-18	0.0188	33	0.115	0.39	0.237	0.126	1.435	0.017	0.380	0.189	0.065	1.29	169	0.014	0.042	-0.665	0.413	1.627	0.833
362T125-30	0.0312	33	0.191	0.65	0.395	0.210	1.438	0.027	0.378	0.339	0.152	3.01	762	0.062	0.068	-0.659	0.410	1.626	0.836
362T125-33	0.0346	33	0.212	0.72	0.438	0.232	1.438	0.030	0.377	0.384	0.174	3.44	1024	0.085	0.076	-0.658	0.409	1.626	0.836
362T125-43	0.0451	33	0.276	0.94	0.571	0.302	1.439	0.039	0.375	0.531	0.245	4.84	1739	0.187	0.098	-0.654	0.407	1.625	0.838
362T125-54	0.0566	50	0.346	1.18	0.723	0.378	1.445	0.048	0.373	0.678	0.312	9.34	3372	0.369	0.123	-0.648	0.404	1.627	0.841
362T125-68	0.0713	50	0.436	1.48	0.921	0.475	1.454	0.060	0.370	0.907	0.427	12.78	4703	0.738	0.156	-0.641	0.399	1.631	0.846
362T125-97	0.1017	50	0.621	2.11	1.343	0.675	1.471	0.082	0.363	1.343	0.675	20.2	6622	2.14	0.226	-0.626	0.39	1.639	0.854
362T150-30	0.0312	33	0.207	0.70	0.449	0.239	1.475	0.045	0.467	0.364	0.158	3.12	762	0.067	0.112	-0.856	0.523	1.768	0.766
362T150-33	0.0346	33	0.229	0.78	0.499	0.264	1.475	0.050	0.467	0.414	0.180	3.56	1024	0.091	0.124	-0.854	0.522	1.767	0.766
362T150-43	0.0451	33	0.298	1.02	0.650	0.343	1.476	0.064	0.465	0.574	0.255	5.04	1739	0.202	0.160	-0.850	0.519	1.766	0.768
362T150-54	0.0566	50	0.374	1.27	0.823	0.431	1.483	0.080	0.462	0.735	0.325	9.74	3372	0.400	0.202	-0.844	0.516	1.768	0.772
362T150-68	0.0713	50	0.471	1.60	1.050	0.542	1.492	0.099	0.459	0.993	0.449	13.43	4703	0.799	0.257	-0.836	0.511	1.771	0.777
362T150-97	0.1017	50	0.672	2.29	1.534	0.771	1.512	0.138	0.453	1.534	0.733	21.94	6622	2.315	0.374	-0.82	0.501	1.778	0.787

[1]Web height-to-thickness ratio exceeds 200. Web stiffeners are required at all support points and concentrated loads.

[2]Allowable moment includes cold work of forming.

Seismic Loading - Lateral-Force Resisting System

Based on ASCE 7-16 CH 12

Seismic Design Parameters

Conterminous 48 States
ASCE 7-16 Seismic Design Provisions
Latitude = 45.513121
Longitude = -122.677709
Spectral Response Accelerations S_s and S_1
S_s and S_1 = Mapped Spectral Acceleration Values
Site Class B: F_a = 0.900 F_v = 0.800
Data are based on a 0.05 deg grid spacing

Period (sec)	S_a (g)	
0.2	0.887	(S_s, Site Class B)
1.0	0.396	(S_1, Site Class B)

Spectral Response Accelerations S_{MS} and S_{M1}
$S_{MS} = F_a \times S_s$ and $S_{M1} = F_v \times S_1$
Site Class D: F_a = 1.200 F_v = 1.904

Period (sec)	S_a (g)	
0.2	1.064	(S_{MS}, Site Class D)
1.0	0.754	(S_{M1}, Site Class D)

Design Spectral Response Accelerations S_{DS} and S_{D1}
$S_{DS} = 2/3 \times S_{MS}$ and $S_{D1} = 2/3 \times S_{M1}$
Site Class D: F_a = 1.200 F_v = 1.904

Period (sec)	S_a (g)	
0.2	0.710	(S_{DS}, Site Class D)
1.0	0.503	(S_{D1}, Site Class D)

Seismic Loading - Nonstructural Components – SUSPENDED CEILING

Based on ASCE 7-16 CH 13

Material Weight:

Support grid	2.0	psf
Ceiling panels	1.0	psf
Hardboard spacers	0.0	psf
Mech / Elec	1.0	psf
Miscellaneous	1.0	psf
Total	**5.0**	**psf**

Installation:

Wire hangers 4'-0" o/c along clip rails
Clip rails at 2'-0" oc
Compression strut and splay wires as required

Seismic Loading - Nonstructural Components

Based on ASCE 7-16 CH 13

Gravity Support:

Transverse spacing	4.0	ft
Longitudinal spacing	2.0	ft
Applied load	5.0	psf
Wire reaction	**40.0**	**lbs**

12 ga wire:

F_t =	70	ksi	
F_y =	30	ksi	
A =	0.0088	in^2	
T allowable =	158.4	lbs	OK

~~Eyehook to Deck:~~ NOT USED

1/4" Eyehook Cap =	73.0	lbs	OK

Use 12 ga wire on 2' x 4' spacing with min (3) wraps at ends and ~~Eye-Hook~~ to (E) roof system

Seismic Loading - Nonstructural Components

Based on ASCE 7-16 CH 13

→ wt of ceiling overly conservative, 1.5 PSF used for seismic

Component: **Acoustic Tile Ceilings** Per ASCE 7-16

Seismic Force, F_p = $[(0.4*a_p*S_{DS}*W_P)/(R_P/I_P)]*(1 + 2*(z/h))$

Lower Limit, F_p = $1.6*S_{DS}*I_P*W_P$

Upper Limit, F_p = $0.3*S_{DS}*I_P*W_P$

Input:

S_S =	0.887		From ATC Hazards Maps
S_1 =	0.396		From ATC Hazards Maps
F_a =	1.200		From ATC Hazards Maps
F_v =	1.904		From ATC Hazards Maps
a_p =	1.0		From Table 13.5-1
R_P =	2.5		From Table 13.5-1
Trib A (max) =	144.0	sq ft	
W_P =	216.0	lb	Tributary ceiling weight
I_P =	1.00		From ASCE 7-16 13.1.3
z =	9.00	ft	Height of point of attachment of component
h =	12.00	ft	Ave. height w/ respect to base

Calculated Values

S_{MS} =	1.065	=	From ASCE Design Hazards Report
S_{M1} =	0.754	=	From Seismic Design Parameters (Calculated)
S_{DS} =	0.710	=	From ASCE Design Hazards Report
S_{D1} =	0.503	=	From Seismic Design Parameters (Calculated)

Resulting Seismic Force

F_p =	61.3	lb	**<< Controls**
F_p (upper limit) =	245.2	lb	
F_p (lower limit) =	46.0	lb	
Use F_p =	**61.3**	**lbs**	

Brace wires:

Transverse spacing	12.0	ft
Longitudinal spacing	12.0	ft
Seismic load	61.3	lb (ULT)
	42.9	lb (ASD)

Assume 45 deg splay each way

Wire seismic load =	61.3	lbs	
Tension load =	86.7	lbs	at 1:1 max slope
T allowable =	158.4	lbs	12 ga wire

Anchorage to roof:

~~Simpson 'PDPA' w/ Cable Eyelet~~ not used

Safe Working Load at 45°	438	lbs (ASD)

~~Simpson 'PDPA' w/ Cable Eyelet~~

not used

Compression struts:

Transverse spacing	12.0	ft
Longitudinal spacing	12.0	ft
Height to structure	3.0	ft
Vertical seismic load	51.1	lbs (ULT)
	35.8	lbs (ASD)

Install compression struts adjacent to seismic splay wires

1/2" dia x 18 ga EMT

t =	0.048	in	
d1 =	0.71	in	
d2 =	0.62	in	
A =	0.088	in^2	
I =	0.005	in^4	
r =	0.235	in	
kl / r =	153		
4.71 sqr(E/Fy) =	146		Use Eq E3-3
Fe =	12.2		
Fcr =	10.72	ksi	
Pn/Ω =	0.562	kips	
=	562.2	lbs	

Use 1/2" dia EMT conduit on max. 12' x 12' spacing

ASCE 7 Hazards Report

Address:
222 SW Columbia St
Portland, Oregon
97201

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

Latitude: 45.513121
Longitude: -122.677709
Elevation: 75.46706704093032 ft (NAVD 88)

Seismic

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

S_S :	0.887	S_{D1} :	N/A
S_1 :	0.396	T_L :	16
F_a :	1.2	PGA :	0.4
F_v :	N/A	PGA_M :	0.481
S_{MS} :	1.065	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1
S_{DS} :	0.71	C_v :	1.244

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

Data Accessed: Mon Nov 27 2023
Date Source: USGS Seismic Design Maps

C21

PARTITION WALL KICKER

PARTIAL WALL HEIGHT = 9'-0"
LIVE TRIB = 4'-6"
LIVE LOAD PER FOOT = 22.5 PLF

TOP TRACK: 362T125-30
KICKER: 362S125-30 @ 4' O/C
FASTENERS TO TRACK: (2) #8 SCREWS
FASTENERS TO STRUCTURE: (1) 1/4" ϕ PAF

CHECK TRACK

ALLOWABLE MOMENT = 3.01 K·IN

$M_{MAX} = \frac{wl^2}{8}$ ∴ $l_{MAX} = \sqrt{\frac{M_{ALLOW}(8)}{w}} = 9.44'$ ∴ max brace spacing of 8'-0" O/C

⇒ top track OK, verify track attached to studs on both sides.

CHECK KICKER

APPLIED AXIAL LOAD = $\frac{22.5\,PLF\,(8')}{\cos(45°)} = 254.6\#\,(1.6) = 407\#$ (conserv.)

ALLOWABLE AXIAL LOAD = $0.9\,(0.194\,IN^2)(33KSI) = 5.76K$ >> APPLIED ∴ OK

CHECK CONNECTION TO TRACK

ALLOWABLE SHEAR = 103# } metal
ALLOWABLE PULLOUT = 48# }

65.1# } wood
140.4# }

APPLIED LOAD = 22.5PLF (4') = 90#

$\frac{90\#}{103\#(2)} + \frac{90\#}{48\#(2)} = 1.374 > 1.0$ ∴ NG

use (3) #8 screws ∴ UTILIZATION = 0.916 ≤ 1.0 ∴ OK

⇒ add additional screw to ea. conn. & verify brace spacing is 4'-0" max

$\frac{90\#}{65.1\#(3)} + \frac{90\#}{140.4\#(3)} = 0.675 \le 1.0$ ∴ OK

TM RIPPEY
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Tigard, Oregon 97223
Phone (503) 443-3900

KOIN TOWER

BY KEJ DATE
CHK BY DATE
JOB NO 23250
SHEET C22 OF

Track (T) Section Properties

Table Notes

1. The centerline bend radius is based on inside corner radii shown in the steel thickness table on page 5.
2. Web depth for track sections is equal to the nominal height plus 2 times the design thickness plus the bend radius.
3. Hems on nonstructural track sections are ignored. Not all track members are hemmed.
4. Effective properties incorporate the strength increase from the cold work of forming as applicable per AISI S100 Section A7.2.
5. For deflection calculations, use the effective moment of inertia.
6. Based on ASTM C645, 18, and 30 mil track material is considered nonstructural.
7. See page 5 for additional table notes.

Section	Design Thickness (in)	Fy (ksi)	Gross Properties							Effective Properties				Torsional Properties					
			Area (in^2)	Weight (lb/ft)	Ix (in^4)	Sx (in^3)	Rx (in)	Iy (in^4)	Ry (in)	Ixe (in^4)	Sxe (in^3)	Ma (in-k)	Vag (lb)	Jx1000 (in^4)	Cw (in^6)	Xo (in)	m (in)	Ro (in)	ß
162T125-18	0.0188	33	0.077	0.26	0.041	0.047	0.733	0.013	0.411	0.030	0.025	0.50	302	0.009	0.007	-0.878	0.503	1.215	0.478
162T125-30	0.0312	33	0.129	0.44	0.070	0.079	0.735	0.022	0.409	0.057	0.050	1.00	597	0.042	0.012	-0.870	0.500	1.210	0.483
162T125-33	0.0346	33	0.143	0.49	0.077	0.087	0.736	0.024	0.408	0.066	0.058	1.15	663	0.057	0.013	-0.868	0.499	1.209	0.484
250T125-18	0.0188	33	0.094	0.32	0.103	0.079	1.051	0.015	0.400	0.078	0.045	0.90	249	0.011	0.018	-0.769	0.460	1.362	0.681
250T125-30	0.0312	33	0.156	0.53	0.173	0.131	1.053	0.025	0.397	0.145	0.090	1.77	832	0.051	0.030	-0.762	0.456	1.359	0.686
250T125-33	0.0346	33	0.173	0.59	0.192	0.145	1.054	0.027	0.397	0.166	0.103	2.03	1024	0.069	0.033	-0.760	0.456	1.358	0.687
250T125-43	0.0451	33	0.225	0.77	0.250	0.188	1.055	0.035	0.395	0.231	0.147	2.91	1356	0.153	0.042	-0.755	0.453	1.356	0.690
250T125-54	0.0566	50	0.282	0.96	0.318	0.236	1.062	0.043	0.392	0.297	0.188	5.64	2563	0.301	0.054	-0.749	0.449	1.357	0.696
250T125-68	0.0713	50	0.355	1.21	0.408	0.297	1.072	0.054	0.389	0.402	0.262	7.85	3199	0.602	0.069	-0.740	0.444	1.360	0.704
250T125-97	0.1017	50	0.506	1.72	0.604	0.423	1.092	0.074	0.383	0.604	0.423	12.67	4476	1.745	0.101	-0.724	0.434	1.365	0.719
250T150-30	0.0312	33	0.172	0.58	0.199	0.151	1.078	0.040	0.486	0.157	0.093	1.83	832	0.056	0.049	-0.975	0.574	1.533	0.595
250T150-33	0.0346	33	0.190	0.65	0.221	0.167	1.079	0.045	0.485	0.179	0.107	2.11	1024	0.076	0.054	-0.973	0.573	1.532	0.596
250T150-43	0.0451	33	0.248	0.84	0.289	0.217	1.080	0.058	0.483	0.252	0.154	3.03	1356	0.168	0.070	-0.968	0.570	1.529	0.599
250T150-54	0.0566	50	0.311	1.06	0.368	0.273	1.088	0.072	0.481	0.325	0.197	5.89	2563	0.332	0.089	-0.961	0.566	1.529	0.605
250T150-68	0.0713	50	0.391	1.33	0.472	0.344	1.099	0.089	0.478	0.445	0.276	8.27	3199	0.663	0.114	-0.953	0.561	1.531	0.613
250T150-97	0.1017	50	0.557	1.9	0.701	0.491	1.121	0.124	0.471	0.701	0.463	13.86	4476	1.921	0.168	-0.935	0.55	1.534	0.629
250T200-33	0.0346	33	0.225	0.76	0.280	0.212	1.117	0.097	0.658	0.203	0.112	2.22	1024	0.090	0.118	-1.418	0.813	1.921	0.455
250T200-43	0.0451	33	0.293	1.00	0.366	0.275	1.118	0.126	0.657	0.288	0.163	3.21	1356	0.198	0.153	-1.413	0.810	1.918	0.457
250T200-54	0.0566	50	0.367	1.25	0.466	0.346	1.127	0.157	0.654	0.371	0.209	6.25	2563	0.392	0.195	-1.405	0.806	1.917	0.462
250T200-68	0.0713	50	0.462	1.57	0.600	0.437	1.139	0.196	0.652	0.517	0.296	8.86	3199	0.783	0.251	-1.396	0.800	1.916	0.469
250T200-97	0.1017	50	0.659	2.24	0.893	0.626	1.165	0.275	0.646	0.856	0.51	15.27	4476	2.271	0.374	-1.376	0.789	1.915	0.484
350T125-18	0.0188	33	0.113	0.38	0.219	0.121	1.394	0.016	0.383	0.174	0.063	1.25	175	0.013	0.038	-0.675	0.418	1.595	0.821
350T125-30	0.0312	33	0.187	0.64	0.365	0.200	1.396	0.027	0.380	0.312	0.145	2.86	790	0.061	0.063	-0.669	0.415	1.594	0.824
350T125-33	0.0346	33	0.207	0.71	0.405	0.222	1.397	0.030	0.379	0.354	0.165	3.27	1024	0.083	0.070	-0.668	0.414	1.594	0.824
350T125-43	0.0451	33	0.270	0.92	0.528	0.288	1.397	0.038	0.377	0.490	0.233	4.61	1739	0.183	0.090	-0.663	0.412	1.592	0.826
350T125-54	0.0566	50	0.339	1.15	0.668	0.361	1.404	0.048	0.375	0.626	0.297	8.89	3372	0.362	0.114	-0.658	0.408	1.595	0.830
350T125-68	0.0713	50	0.427	1.45	0.851	0.454	1.412	0.059	0.372	0.839	0.407	12.18	4536	0.723	0.144	-0.650	0.403	1.599	0.835
350T125-97	0.1017	50	0.608	2.07	1.243	0.645	1.43	0.081	0.366	1.243	0.645	19.3	6383	2.096	0.209	-0.636	0.394	1.607	0.844
350T150-30	0.0312	33	0.203	0.69	0.416	0.228	1.432	0.045	0.469	0.336	0.150	2.96	790	0.066	0.103	-0.867	0.528	1.739	0.751
350T150-33	0.0346	33	0.225	0.76	0.461	0.253	1.432	0.049	0.469	0.382	0.171	3.39	1024	0.090	0.114	-0.866	0.527	1.738	0.752
350T150-43	0.0451	33	0.293	1.00	0.601	0.328	1.433	0.064	0.467	0.531	0.243	4.80	1739	0.198	0.148	-0.861	0.525	1.736	0.754
350T150-54	0.0566	50	0.367	1.25	0.761	0.412	1.440	0.079	0.465	0.679	0.310	9.28	3372	0.392	0.187	-0.855	0.521	1.738	0.758
350T150-68	0.0713	50	0.462	1.57	0.972	0.518	1.450	0.099	0.462	0.919	0.428	12.81	4536	0.783	0.238	-0.847	0.516	1.741	0.763
350T150-97	0.1017	50	0.659	2.24	1.422	0.738	1.469	0.136	0.455	1.422	0.701	20.98	6383	2.271	0.346	-0.831	0.506	1.748	0.774
350T200-33	0.0346	33	0.259	0.88	0.574	0.315	1.487	0.108	0.647	0.428	0.181	3.57	1024	0.103	0.249	-1.285	0.761	2.069	0.614
350T200-43	0.0451	33	0.338	1.15	0.749	0.409	1.489	0.140	0.645	0.600	0.257	5.09	1739	0.229	0.323	-1.280	0.758	2.066	0.616
350T200-54	0.0566	50	0.424	1.44	0.949	0.513	1.496	0.175	0.642	0.770	0.329	9.85	3372	0.453	0.409	-1.273	0.754	2.067	0.621
350T200-68	0.0713	50	0.534	1.82	1.213	0.647	1.508	0.218	0.639	1.054	0.458	13.71	4536	0.904	0.522	-1.264	0.749	2.069	0.626
350T200-97	0.1017	50	0.761	2.59	1.78	0.923	1.53	0.305	0.633	1.708	0.769	23.01	6383	2.622	0.765	-1.247	0.738	2.073	0.638
350T250-43	0.0451	33	0.383	1.30	0.896	0.490	1.530	0.257	0.819	0.659	0.268	5.29	1739	0.260	0.593	-1.719	0.996	2.443	0.505
350T250-54	0.0566	50	0.480	1.63	1.137	0.615	1.538	0.321	0.817	0.846	0.343	10.26	3372	0.513	0.752	-1.712	0.992	2.442	0.509
350T250-68	0.0713	50	0.605	2.06	1.454	0.776	1.550	0.401	0.814	1.168	0.479	14.35	4536	1.025	0.961	-1.703	0.987	2.443	0.514
350T250-97	0.1017	50	0.862	2.93	2.139	1.109	1.575	0.563	0.808	1.924	0.815	24.39	6383	2.973	1.413	-1.684	0.975	2.443	0.525
362T125-18	0.0188	33	0.115	0.39	0.237	0.126	1.435	0.017	0.380	0.189	0.065	1.29	169	0.014	0.042	-0.665	0.413	1.627	0.833
362T125-30	0.0312	33	0.191	0.65	0.395	0.210	1.438	0.027	0.378	0.339	0.152	3.01	762	0.062	0.068	-0.659	0.410	1.626	0.836
362T125-33	0.0346	33	0.212	0.72	0.438	0.232	1.438	0.030	0.377	0.384	0.174	3.44	1024	0.085	0.076	-0.658	0.409	1.626	0.836
362T125-43	0.0451	33	0.276	0.94	0.571	0.302	1.439	0.039	0.375	0.531	0.245	4.84	1739	0.187	0.098	-0.654	0.407	1.625	0.838
362T125-54	0.0566	50	0.346	1.18	0.723	0.378	1.445	0.048	0.373	0.678	0.312	9.34	3372	0.369	0.123	-0.648	0.404	1.627	0.841
362T125-68	0.0713	50	0.436	1.48	0.921	0.475	1.454	0.060	0.370	0.907	0.427	12.78	4703	0.738	0.156	-0.641	0.399	1.631	0.846
362T125-97	0.1017	50	0.621	2.11	1.343	0.675	1.471	0.082	0.363	1.343	0.675	20.2	6622	2.14	0.226	-0.626	0.39	1.639	0.854
362T150-30	0.0312	33	0.207	0.70	0.449	0.239	1.475	0.045	0.467	0.364	0.158	3.12	762	0.067	0.112	-0.856	0.523	1.768	0.766
362T150-33	0.0346	33	0.229	0.78	0.499	0.264	1.475	0.050	0.467	0.414	0.180	3.56	1024	0.091	0.124	-0.854	0.522	1.767	0.766
362T150-43	0.0451	33	0.298	1.02	0.650	0.343	1.476	0.064	0.465	0.574	0.255	5.04	1739	0.202	0.160	-0.850	0.519	1.766	0.768
362T150-54	0.0566	50	0.374	1.27	0.823	0.431	1.483	0.080	0.462	0.735	0.325	9.74	3372	0.400	0.202	-0.844	0.516	1.768	0.772
362T150-68	0.0713	50	0.471	1.60	1.050	0.542	1.492	0.099	0.459	0.993	0.449	13.43	4703	0.799	0.257	-0.836	0.511	1.771	0.777
362T150-97	0.1017	50	0.672	2.29	1.534	0.771	1.512	0.138	0.453	1.534	0.733	21.94	6622	2.315	0.374	-0.82	0.501	1.778	0.787

[1]Web height-to-thickness ratio exceeds 200. Web stiffeners are required at all support points and concentrated loads.

[2]Allowable moment includes cold work of forming.

C23

SSMA

Table Notes

1. The centerline bend radius is based on inside corner radii shown in the steel thickness table on page 5.
2. Effective properties incorporate the strength increase from the cold work of forming as applicable per AISI S100 Section A7.2.
3. Tabulated gross properties are based on the full-unreduced cross section of the studs away from punchouts.
4. For deflection calculations, use the effective moment of inertia.
5. Allowable moment is the lesser of M_{al} and M_{ad}. Stud distortional buckling is based on an assumed $K\varphi = 0$.
6. See page 5 for additional table notes.

Section	Design Thickness (in)	Fy (ksi)	Gross Properties							Effective Properties						Torsional Properties						Lu (in)
			Area (in^2)	Weight (lb/ft)	Ix (in^4)	Sx (in^3)	Rx (in)	Iy (in^4)	Ry (in)	Ixe (in^4)	Sxe (in^3)	Mal (in-k)	Mad (in-k)	Vag (lb)	Vanet (lb)	Jx1000 (in^4)	Cw (in^6)	Xo (in)	m (in)	Ro (in)	ß	
162S125-18	0.0188	33	0.080	0.27	0.038	0.046	0.686	0.016	0.447	0.034	0.031	0.61	0.65	302	100	0.009	0.009	-1.029	0.594	1.315	0.388	29.0
162S125-30	0.0312	33	0.131	0.45	0.061	0.075	0.681	0.026	0.441	0.060	0.060	1.19	1.29	543	106	0.043	0.014	-1.014	0.585	1.298	0.390	29.2
162S125-33	0.0346	33	0.145	0.49	0.067	0.083	0.679	0.028	0.440	0.066	0.069	1.37	1.48	601	105	0.058	0.016	-1.010	0.583	1.294	0.391	29.2
250S125-18	0.0188	33	0.097	0.33	0.099	0.079	1.014	0.019	0.439	0.089	0.059	1.17	1.03	258	196	0.011	0.023	-0.904	0.543	1.427	0.599	29.0
250S125-30	0.0312	33	0.159	0.54	0.161	0.129	1.008	0.030	0.433	0.159	0.110	2.17	2.09	832	378	0.052	0.037	-0.889	0.534	1.412	0.603	28.9
250S125-33	0.0346	33	0.176	0.60	0.178	0.142	1.006	0.033	0.431	0.175	0.125	2.48	2.41	975	399	0.070	0.040	-0.885	0.532	1.408	0.605	28.9
250S125-43	0.0451	33	0.227	0.77	0.228	0.182	1.001	0.041	0.426	0.225	0.177	3.49	3.43	1265	394	0.154	0.050	-0.873	0.525	1.396	0.608	28.9
250S125-54	0.0566	33	0.280	0.95	0.277	0.222	0.994	0.049	0.419	0.277	0.218	4.98 [2]	5.07	1553	373	0.299	0.060	-0.859	0.518	1.379	0.612	26.8
250S125-54	0.0566	50	0.280	0.95	0.277	0.222	0.994	0.049	0.419	0.274	0.209	6.25	6.17	2353	565	0.299	0.060	-0.859	0.518	1.379	0.612	23.3
250S125-68	0.0713	33	0.345	1.18	0.334	0.267	0.984	0.057	0.408	0.334	0.266	6.30 [2]	6.32	1891	342	0.585	0.072	-0.839	0.508	1.356	0.617	26.5
250S125-68	0.0713	50	0.345	1.18	0.334	0.267	0.984	0.057	0.408	0.334	0.262	7.84	8.01	2866	519	0.585	0.072	-0.839	0.508	1.356	0.617	23.3
350S125-18	0.0188	33	0.115	0.39	0.215	0.123	1.366	0.021	0.423	0.203	0.072	1.42	1.47	180	159	0.014	0.050	-0.797	0.495	1.637	0.763	28.8
350S125-30	0.0312	33	0.190	0.65	0.351	0.201	1.359	0.033	0.417	0.346	0.150	2.96	3.04	824	436	0.062	0.079	-0.784	0.487	1.624	0.767	28.6
350S125-33	0.0346	33	0.210	0.72	0.387	0.221	1.358	0.036	0.415	0.382	0.175	3.45	3.53	1024	487	0.084	0.087	-0.780	0.485	1.620	0.768	28.6
350S125-43	0.0451	33	0.272	0.93	0.498	0.284	1.352	0.046	0.410	0.495	0.258	5.10	5.11	1739	631	0.184	0.109	-0.769	0.479	1.609	0.771	28.4
350S125-54	0.0566	50	0.337	1.15	0.608	0.348	1.344	0.055	0.402	0.604	0.308	9.22	9.25	3372	947	0.360	0.131	-0.755	0.471	1.593	0.775	22.9
350S125-68	0.0713	50	0.417	1.42	0.739	0.422	1.332	0.064	0.391	0.737	0.400	11.97	12.54	4202	897	0.706	0.156	-0.737	0.462	1.571	0.780	22.8
362S125-18	0.0188	33	0.118	0.40	0.234	0.129	1.409	0.021	0.421	0.221	0.075	1.48	1.52	173	163	0.014	0.054	-0.786	0.490	1.667	0.778	28.8
362S125-30	0.0312	33	0.194	0.66	0.381	0.210	1.402	0.033	0.415	0.376	0.156	3.08	3.17	794	449	0.063	0.086	-0.773	0.482	1.654	0.782	28.6
362S125-33	0.0346	33	0.215	0.73	0.421	0.232	1.400	0.037	0.413	0.415	0.182	3.59	3.67	1024	521	0.086	0.094	-0.769	0.480	1.650	0.783	28.5
362S125-43	0.0451	33	0.278	0.95	0.540	0.298	1.395	0.046	0.408	0.537	0.269	5.31	5.33	1739	676	0.188	0.118	-0.758	0.473	1.639	0.786	28.4
362S125-54	0.0566	50	0.344	1.17	0.661	0.365	1.386	0.055	0.400	0.656	0.321	9.62	9.65	3372	1016	0.367	0.142	-0.744	0.466	1.623	0.790	22.8
362S125-68	0.0713	50	0.426	1.45	0.803	0.443	1.374	0.065	0.389	0.802	0.418	12.52	13.11	4370	1004	0.721	0.169	-0.726	0.457	1.602	0.795	22.7
400S125-18 [1]	0.0188	33	0.125	0.42	0.294	0.147	1.536	0.021	0.414	0.281	0.083	1.64	1.68	156	156	0.015	0.068	-0.754	0.475	1.760	0.816	28.7
400S125-30	0.0312	33	0.206	0.70	0.481	0.240	1.529	0.034	0.408	0.474	0.174	3.44	3.53	715	484	0.067	0.107	-0.741	0.467	1.748	0.820	28.5
400S125-33	0.0346	33	0.228	0.77	0.531	0.265	1.527	0.038	0.407	0.524	0.203	4.01	4.10	976	595	0.091	0.118	-0.738	0.465	1.744	0.821	28.4
400S125-43	0.0451	33	0.295	1.00	0.682	0.341	1.521	0.048	0.402	0.680	0.301	5.96	5.99	1739	810	0.200	0.148	-0.727	0.459	1.733	0.824	28.2
400S125-54	0.0566	50	0.365	1.24	0.835	0.418	1.512	0.057	0.394	0.830	0.361	10.81	10.87	3372	1223	0.390	0.178	-0.713	0.451	1.718	0.828	22.7
400S125-68	0.0713	50	0.452	1.54	1.017	0.509	1.499	0.066	0.383	1.015	0.474	14.18	14.84	4871	1356	0.767	0.213	-0.695	0.442	1.696	0.832	22.5
550S125-18 [1,3]	0.0188	33	0.153	0.52	0.630	0.229	2.029	0.023	0.390	-	-	-	-	-	-	0.018	0.140	-0.651	0.423	2.166	0.910	22.9
550S125-30	0.0312	33	0.252	0.86	1.031	0.375	2.021	0.037	0.384	0.996	0.286	5.65	4.95	512	512	0.082	0.224	-0.639	0.415	2.154	0.912	27.9
550S125-33	0.0346	33	0.279	0.95	1.139	0.414	2.019	0.041	0.382	1.111	0.335	6.62	5.78	699	699	0.112	0.246	-0.635	0.413	2.151	0.913	27.8
550S125-43	0.0451	33	0.362	1.23	1.468	0.534	2.013	0.052	0.377	1.458	0.500	9.88	8.61	1550	1199	0.246	0.309	-0.625	0.407	2.141	0.915	27.6
550S125-54	0.0566	50	0.450	1.53	1.805	0.656	2.002	0.061	0.369	1.791	0.606	18.13	15.75	3093	1881	0.481	0.374	-0.613	0.401	2.126	0.917	22.1
550S125-68	0.0713	50	0.559	1.90	2.209	0.803	1.987	0.072	0.358	2.205	0.791	23.68	21.98	5350	2532	0.948	0.448	-0.597	0.392	2.106	0.920	21.8
600S125-18 [1,3]	0.0188	33	0.162	0.55	0.778	0.259	2.189	0.024	0.382	-	-	-	-	-	-	0.019	0.172	-0.623	0.408	2.308	0.927	22.7
600S125-30	0.0312	33	0.268	0.91	1.275	0.425	2.181	0.038	0.376	1.218	0.315	6.22	5.39	468	468	0.087	0.274	-0.611	0.401	2.296	0.929	27.6
600S125-33	0.0346	33	0.297	1.01	1.409	0.470	2.179	0.042	0.374	1.361	0.369	7.30	6.32	638	638	0.118	0.300	-0.608	0.399	2.293	0.930	27.6
600S125-43	0.0451	33	0.385	1.31	1.817	0.606	2.173	0.053	0.369	1.807	0.555	10.96	9.46	1416	1240	0.261	0.378	-0.598	0.393	2.284	0.931	27.3
600S125-54	0.0566	50	0.479	1.63	2.236	0.745	2.161	0.063	0.362	2.220	0.673	20.15	17.34	2823	1947	0.511	0.457	-0.586	0.386	2.269	0.933	21.9
600S125-68	0.0713	50	0.595	2.02	2.740	0.913	2.146	0.073	0.351	2.735	0.898	26.88	24.34	5350	2879	1.008	0.548	-0.570	0.378	2.248	0.936	21.6
800S125-33 [1]	0.0346	33	0.366	1.25	2.881	0.720	2.806	0.044	0.347	2.656	0.507	10.02	8.22	474	474	0.146	0.582	-0.519	0.349	2.875	0.967	26.6
800S125-43	0.0451	33	0.475	1.62	3.721	0.930	2.799	0.056	0.342	3.581	0.773	15.27	12.56	1051	1051	0.322	0.735	-0.510	0.344	2.865	0.968	26.3
800S125-54	0.0566	50	0.592	2.01	4.593	1.148	2.786	0.066	0.335	4.431	0.942	28.21	23.18	2091	2091	0.632	0.889	-0.499	0.338	2.850	0.969	21.1
800S125-68	0.0713	50	0.738	2.51	5.653	1.413	2.768	0.078	0.324	5.632	1.287	38.54	33.22	4221	3367	1.250	1.068	-0.485	0.330	2.829	0.971	20.8

[1] Web height-to-thickness ratio exceeds 200. Web stiffeners are required at all support points and concentrated loads.

[2] Allowable moment includes cold work of forming.

[3] Where web height-to-thickness ratio exceeds 260 or flange width-to-thickness ratio exceeds 60, effective properties are not calculated. See AISI S100 Section B1. Application of these products in a non-composite design shall be approved by a design professional.

C24

CHECK CONNECTION AT STRUCTURE

ALLOWABLE SHEAR = 167#

ALLOWABLE TENSION = 130#

$$\frac{90\#}{167\#} + \frac{90\#}{130\#} = 1.231 > 1.0 \text{ ∴ NG}$$

add additional PAF ∴ UTILIZATION = 0.616 ≤ 1.0 ∴ OK

⟹ add additional PAF to ea. conn. & verify brace spacing is 4'-0" max O/C.

SUSPENDED CEILING CABLE BRACE

CHECK CONNECTION AT STRUCTURE

ALLOWABLE SHEAR = 167#

ALLOWABLE TENSION = 130#

GRAVITY LOAD = 40# from C17

$$\frac{40\#}{130\#} = 0.308 \leq 1.0 \text{ ∴ OK}$$

⟹ verify spacing is as previously specified & cable is min 12G4

SEISMIC LOAD = 61.3# from C18

$$\frac{61.3\#}{167\#} + \frac{61.3\#}{130\#} = 0.839 > 1.0 \text{ ∴ OK}$$

TM RIPPEY
CONSULTING ENGINEERS
7650 S.W. Beveland St, Suite 100
Tigard, Oregon 97223
Phone (503) 443-3900

CEILING CLIP PERFORMANCE/SUBMITTAL

Ramset fasteners may be specified by their type or catalog number to satisfy fastening requirements.

PIN SPECIFICATIONS

- Made from AISI 1060-1065 steel. Austempered to a core hardness of 52-56 Rc
- Typical tensile strength: 270,000 psi
- Typical shear strength: 162,000 psi
- **STANDARD FINISHES**

  Mechanical zinc plate to a minimum thickness of .0002 meets requirements of ASTM B695—Class 5 Type 1

APPROVALS/LISTINGS

- **ICC Evaluation Service, Inc.**

  #ESR-1799 Powder Pins & Clips
- **City of Los Angeles**

  #RR-22668 Powder pins

CLIP SPECIFICATIONS

- **3/4" WIDE 14G THICKNESS**

  Material conforms to ASTM A653


SDC


SPC + TEC

Angle Clip in Concrete

PART NUMBER SERIES	SHANK DIAMETER (INCH)	MINIMUM PENETRATION (INCH)	INSTALLED IN NORMAL WEIGHT CONCRETE CONCRETE COMPRESSIVE STRENGTH ALLOWABLE LOAD - *Ultimate Load*					
			4000 PSI			6000 PSI		
			TENSION (LBS)	SHEAR (LBS)	OBLIQUE (LBS)	TENSION (LBS)	SHEAR (LBS)	OBLIQUE (LBS)
SDC100 SDC125	0.145	7/8	**115** *575*	**120** *1014*	**145** *726*	....	....	....
SDC125	0.145	1-1/8	**130** *744*	**167** *1090*	**205** *1032*	....	....	....
SPC78	0.150	3/4	**155** *897*	**188** *1050*	....	**150** *788*	**153** *949*	**140** *769*
SPC114	.150/.180	1-1/8	**127** *811*	**226** *1130*	**181** *904*	**169** *853*	**300** *1500*	**223** *1114*
TEC100	0.157	7/8	**207** *1035*	....	....	....	....	....

PART NUMBER SERIES	SHANK DIAMETER (INCH)	MINIMUM PENETRATION (INCH)	ALLOWABLE WORKING VALUES INSTALLED IN 3000 PSI LIGHTWEIGHT CONCRETE ALLOWABLE LOAD - Ultimate Load				
			3000 PSI LIGHTWEIGHT WITH METAL DECKING				
			LOWER FLUTE TENSION (LBS)	LOWER FLUTE SHEAR (LBS)	LOWER FLUTE OBLIQUE (LBS)	UPPER FLUTE TENSION (LBS)	UPPER FLUTE SHEAR (LBS)
SDC100 SDC125	0.145	7/8	**67** *335*	**237** *1186*	**90** *448*	**104** *571*	**310** *1678*
SDC125	0.145	1-1/8	**94** *471*	**276** *1378*	**119** *596*	**106** *528*	**319** *1597*
SPC78	0.150	3/4	**59** *293*	**202** *1109*	**65** *323*	**84** *419*	**324** *1622*
SPC114	.150/.180	1-1/8	**157** *786*	**272** *1358*	**153** *766*	**180** *899*	**334** *1673*
TEC100	0.157	7/8	**88** *498*	....	....	....	....

Note 1: ALLOWABLE loads are shown in the **LARGE BOLD** font, *Ultimate* loads are shown in *smaller italic* font. **Note 2:** Testing conducted in accordance with ICC AC70 & ASTM E1190. **Note 3:** Safety factors are based on coefficient of variation. In accordance with ICC AC70, the safety factor will be no less than 5. **Note 4:** Values shown in concrete are for the clip assembly only. Connected members must be investigated separately. **Note 5:** Cyclic, fatigue, shock loads, and other design criteria may require a different safety factor. **Note 6:** Job site testing may be required to determine actual job site values. **Note 7:** Minimum edge distance is 3 inches unless otherwise approved. **Note 8:** For SI: 1 lbf = 4.448 N, 1 inch = 25.4 mm, 1 ksi = 6.89MPa. **Note 9:** Metal deck is 20g. Ceiling clips = ASTM A653