

MYERS ENGINEERING

GRADE BEAM CALCULATIONS



Mark
Myers
2025.10.2
7 19:21:46
-07'00'

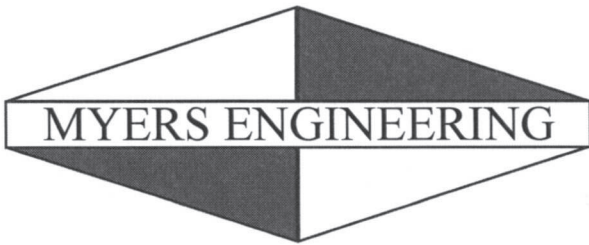
MUST BEAR ORIGINAL BLUE INK SIGNATURE OR
DIGITAL PDF SIGNATURE FOR PERMIT SUBMITTAL.

Project: Schwartz Residence Gate
7301 West Mercer Way
Mercer Island, WA

October 27, 2025

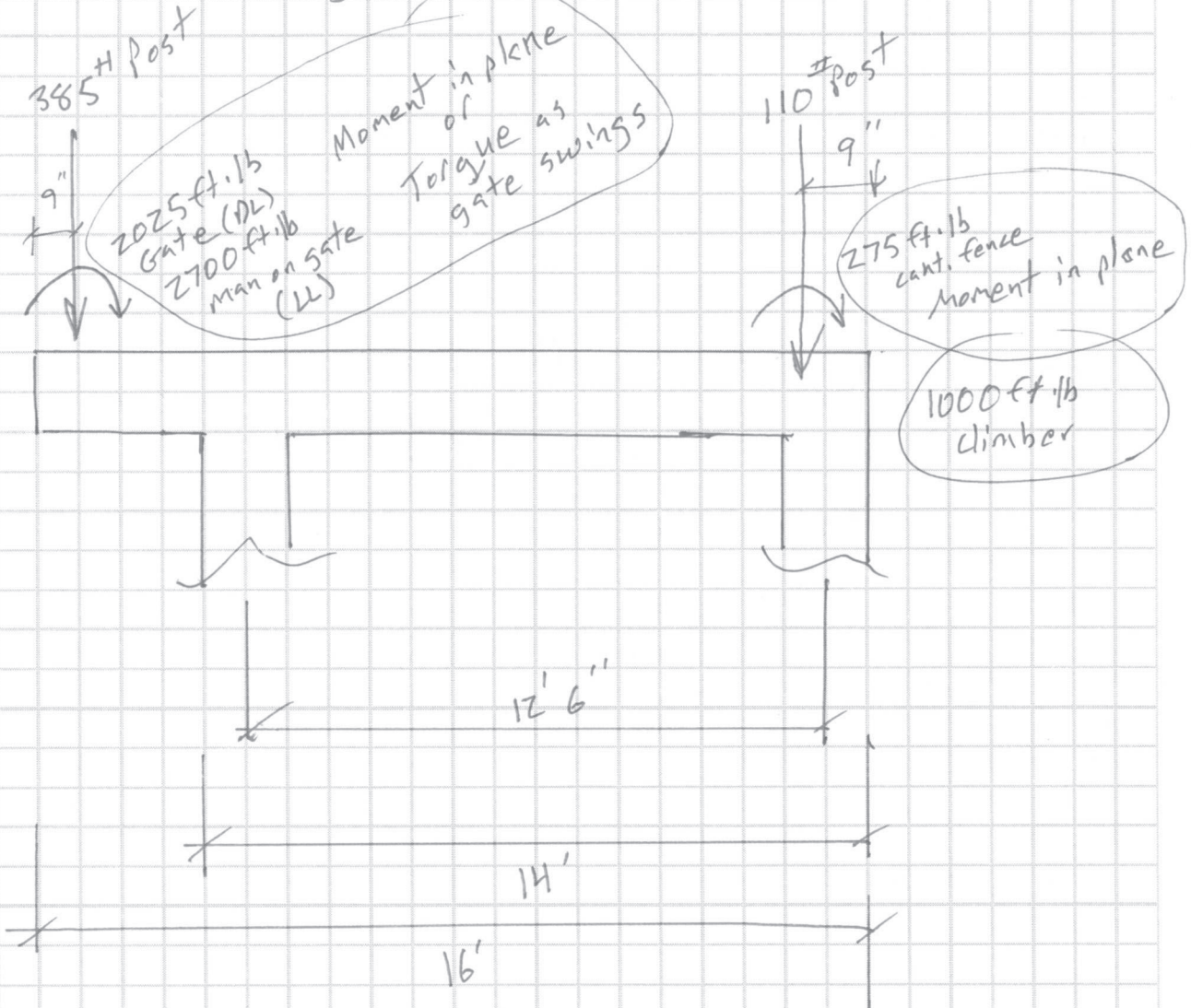
2021 INTERNATIONAL BUILDING CODE
100 MPH WIND, EXPOSURE C, $K_{zt} = 1.00$
RISK CATEGORY II - SOIL SITE CLASS D
SEISMIC DESIGN CATEGORY D (IBC)

3206 50th Street Court NW, Suite 210-B
Gig Harbor, WA 98335
Phone: 253-858-3248
Email: myengineer@centurytel.net



Myers Engineering LLC
3206 50th St Ct NW, Ste 210-B
Gig Harbor, WA 98335
(253) 858-3248
Fax (253) 858-3249
myengineer@centurytel.net

LL assumed as 200# person riding gate during opening or climbing fence panel



FOR RKK
JOB Schwartz Gate

DATE 10-19-25
BY MM

Concrete Beam

Project File: Schwartz Beam Checks.ec6

LIC#: KW-06015659, Build:20.25.10.02

MYERS ENGINEERING

(c) ENERCALC, LLC 1982-2025

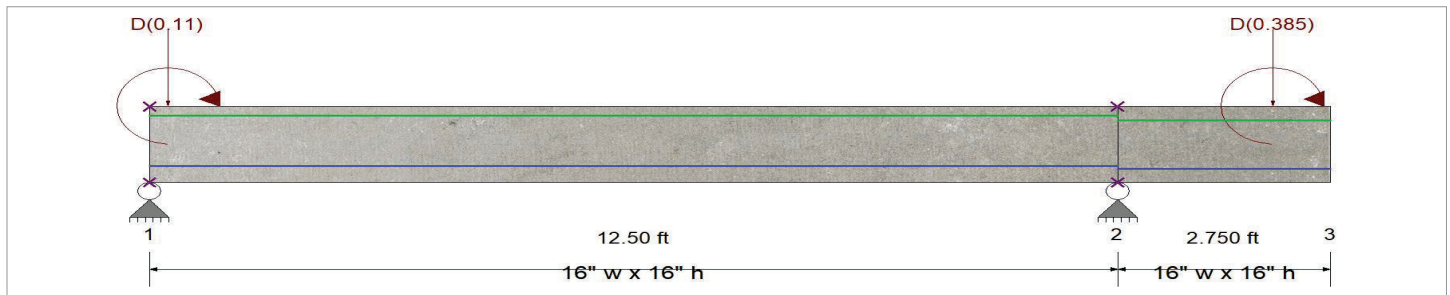
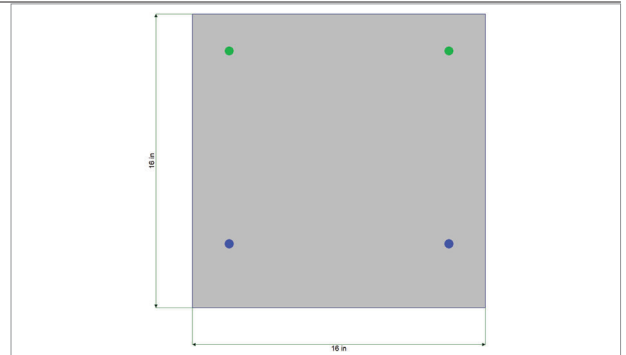
DESCRIPTION: Grade beam for gate posts

Code References

Governing Code : IBC 2021
 Referenced Design Standard(s) : ACI 318-19
 Load Combination Set : IBC 2021

General Information

f_c	=	2.50 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f_c^{1/2}$	=	375.0 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	40.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2
Seismic Design Category	=	A			



Cross Section & Reinforcing Details

Rectangular Section, Width = 16.0 in, Height = 16.0 in

Span #1 Reinforcing....

2-#4 at 3.50 in from Bottom, from 0.0 to 12.50 ft in this span 2-#4 at 2.0 in from Top, from 0.0 to 12.50 ft in this span

Span #2 Reinforcing....

2-#4 at 3.0 in from Bottom, from 0.0 to 2.750 ft in this span 2-#4 at 3.0 in from Top, from 0.0 to 2.750 ft in this span

Beam self weight calculated and added to loads

Load for Span Number 1

Point Load : D = 0.110 k @ 0.250 ft, (Strike Post Vertical Load)

Moment : D = -0.2750 k-ft, Location = 0.250 ft from left end of this span, (Strike Post Moment at Base from Fence)

Load for Span Number 2

Point Load : D = 0.3850 k @ 2.0 ft, (Hinge Post vertical load)

Moment : D = -2.025, L = -2.70 k-ft, Location = 2.0 ft from left end of this span, (on concrete beam)

Concrete Beam

Project File: Schwartz Beam Checks.ec6

LIC# : KW-06015659, Build:20.25.10.02

MYERS ENGINEERING

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: Grade beam for gate posts

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.367 : 1	
Section used for this span	Typical Section	
Mu : Applied	8.475 k-ft	
Mn * Phi : Allowable	23.121 k-ft	
Location of maximum on span	7.551 ft	
Span # where maximum occurs	Span # 1	
Maximum Deflection		
Max Downward Transient Deflection	0.003 in	Ratio = 54757 >=480.0 L Only
Max Upward Transient Deflection	-0.004 in	Ratio = 16124 >=480.0
Max Downward Total Deflection	0.011 in	Ratio = 13613 >=360.0
Max Upward Total Deflection	-0.010 in	Ratio = 6290 >=360.0 Span: 2 : +D+L

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in^4)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 2- #4 @ d=12.5", 2- #4 @ d=2",	277,454.57	347,505.47	5,461.33	451.10	578.16
Section 2 2- #4 @ d=13", 2- #4 @ d=3",	315,105.47	315,105.47	5,461.33	492.11	492.11

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	1.979	2.663	
Max Upward from Load Combinations	1.979	2.447	
Max Upward from Load Cases	1.763	2.663	
Max Downward from all Load Conditions (Resisting Uplift)		-0.216	
Max Downward from Load Cases (Resisting Uplift)		-0.216	
D Only	1.763	2.663	
+D+L	1.979	2.447	
L Only	0.216	-0.216	

Shear Stirrup Requirements

Entire Beam Span Length : Ties Not Req'd, Stirrups are not required.

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)	Av, min Req'd?	Spacing Req'd (in)	Phi Vc (k)	Phi Vc (k)	Phi Vn (k)	Vu / Phi Vn	Vc Eqn (T22.5.5.1)	Spacing Provision
+1.20D+1.60L	1	0.00	7.25	2.46	No	N/A	6.62	0.00	6.62	0.372	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	0.31	7.25	2.23	No	N/A	6.62	0.00	6.62	0.337	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	0.61	7.25	2.14	No	N/A	6.62	0.00	6.62	0.323	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	0.92	7.25	2.05	No	N/A	6.62	0.00	6.62	0.309	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	1.22	7.25	1.95	No	N/A	6.62	0.00	6.62	0.295	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	1.53	7.25	1.86	No	N/A	6.62	0.00	6.62	0.280	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	1.84	7.25	1.76	No	N/A	6.62	0.00	6.62	0.266	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	2.14	7.25	1.67	No	N/A	6.62	0.00	6.62	0.252	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	2.45	7.25	1.57	No	N/A	6.62	0.00	6.62	0.237	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	2.76	7.25	1.48	No	N/A	6.62	0.00	6.62	0.223	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	3.06	7.25	1.38	No	N/A	6.62	0.00	6.62	0.209	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	3.37	7.25	1.29	No	N/A	6.62	0.00	6.62	0.194	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	3.67	7.25	1.19	No	N/A	6.62	0.00	6.62	0.180	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	3.98	7.25	1.10	No	N/A	6.62	0.00	6.62	0.166	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	4.29	7.25	1.00	No	N/A	6.62	0.00	6.62	0.152	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	4.59	7.25	0.91	No	N/A	6.62	0.00	6.62	0.137	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	4.90	7.25	0.81	No	N/A	6.62	0.00	6.62	0.123	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	5.20	7.25	0.72	No	N/A	6.62	0.00	6.62	0.109	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	5.51	7.25	0.63	No	N/A	6.62	0.00	6.62	0.094	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	5.82	7.25	0.53	No	N/A	6.62	0.00	6.62	0.080	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	6.12	7.25	0.44	No	N/A	6.62	0.00	6.62	0.066	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	6.43	7.25	0.34	No	N/A	6.62	0.00	6.62	0.051	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	6.73	7.25	0.25	No	N/A	6.62	0.00	6.62	0.037	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	7.04	7.25	0.15	No	N/A	6.62	0.00	6.62	0.023	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	7.35	7.25	0.06	No	N/A	6.62	0.00	6.62	0.009	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	7.65	7.25	-0.04	No	N/A	6.62	0.00	6.62	0.006	Eqn (b)	Ties Not Req'd
+1.20D+1.60L	1	7.96	7.25	-0.13	No	N/A	6.62	0.00	6.62	0.020	Eqn (b)	Ties Not Req'd

Myers Engineering LLC
 Mark Myers, PE
 3206 50th Street CT, Ste. 210-B
 Gig Harbor, WA 98335
 253-858-3248
 myengineer@centurytel.net

Project Title: Schwartz Remodel
 Engineer:
 Project ID:
 Project Descr: Checking Beams for removal of post

Printed: 26 OCT 2025, 1:51PM

Concrete Beam

Project File: Schwartz Beam Checks.ec6

LIC# : KW-06015659, Build:20.25.10.02

MYERS ENGINEERING

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: Grade beam for gate posts

Detailed Shear Information

Load Combination	Span Number	Span (ft)	Distance (ft)	'd' (in)	Vu (k)	Av, min Req'd?	Spacing Req'd (in)	ϕV_c (k)	ϕV_c (k)	ϕV_n (k)	Vu / ϕV_n	Vc Eqn (T22.5.5.1)	Spacing Provision
+1.20D+1.60L	1	8.27	7.25	-0.23	No	N/A	6.62	0.00	6.62	0.034	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	1	8.57	7.25	-0.32	No	N/A	6.62	0.00	6.62	0.049	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	1	8.88	7.25	-0.42	No	N/A	6.62	0.00	6.62	0.063	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	1	9.18	7.25	-0.51	No	N/A	6.62	0.00	6.62	0.077	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	1	9.49	7.25	-0.61	No	N/A	6.62	0.00	6.62	0.091	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	1	9.80	7.25	-0.70	No	N/A	6.62	0.00	6.62	0.106	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	1	10.10	7.25	-0.80	No	N/A	6.62	0.00	6.62	0.120	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	1	10.41	7.25	-0.89	No	N/A	6.62	0.00	6.62	0.134	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	1	10.71	7.25	-0.98	No	N/A	6.62	0.00	6.62	0.149	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	1	11.02	7.25	-1.08	No	N/A	6.62	0.00	6.62	0.163	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	1	11.33	7.25	-1.17	No	N/A	6.62	0.00	6.62	0.177	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	1	11.63	7.25	-1.27	No	N/A	6.62	0.00	6.62	0.192	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	1	11.94	7.25	-1.36	No	N/A	6.62	0.00	6.62	0.206	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	1	12.24	7.25	-1.46	No	N/A	6.62	0.00	6.62	0.220	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	12.51	8.00	1.31	No	N/A	7.07	0.00	7.07	0.185	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	12.58	8.00	1.29	No	N/A	7.07	0.00	7.07	0.182	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	12.65	8.00	1.27	No	N/A	7.07	0.00	7.07	0.179	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	12.71	8.00	1.25	No	N/A	7.07	0.00	7.07	0.176	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	12.78	8.00	1.23	No	N/A	7.07	0.00	7.07	0.173	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	12.85	8.00	1.21	No	N/A	7.07	0.00	7.07	0.170	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	12.92	8.00	1.18	No	N/A	7.07	0.00	7.07	0.167	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	12.98	8.00	1.16	No	N/A	7.07	0.00	7.07	0.164	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.05	8.00	1.14	No	N/A	7.07	0.00	7.07	0.162	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.12	8.00	1.12	No	N/A	7.07	0.00	7.07	0.159	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.18	8.00	1.10	No	N/A	7.07	0.00	7.07	0.156	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.25	8.00	1.08	No	N/A	7.07	0.00	7.07	0.153	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.32	8.00	1.06	No	N/A	7.07	0.00	7.07	0.150	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.39	8.00	1.04	No	N/A	7.07	0.00	7.07	0.147	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.45	8.00	1.02	No	N/A	7.07	0.00	7.07	0.144	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.52	8.00	1.00	No	N/A	7.07	0.00	7.07	0.141	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.59	8.00	0.98	No	N/A	7.07	0.00	7.07	0.138	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.66	8.00	0.96	No	N/A	7.07	0.00	7.07	0.135	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.72	8.00	0.93	No	N/A	7.07	0.00	7.07	0.132	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.79	8.00	0.91	No	N/A	7.07	0.00	7.07	0.129	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.86	8.00	0.89	No	N/A	7.07	0.00	7.07	0.126	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.93	8.00	0.87	No	N/A	7.07	0.00	7.07	0.123	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	13.99	8.00	0.85	No	N/A	7.07	0.00	7.07	0.120	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.06	8.00	0.83	No	N/A	7.07	0.00	7.07	0.117	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.13	8.00	0.81	No	N/A	7.07	0.00	7.07	0.114	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.19	8.00	0.79	No	N/A	7.07	0.00	7.07	0.111	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.26	8.00	0.77	No	N/A	7.07	0.00	7.07	0.109	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.33	8.00	0.75	No	N/A	7.07	0.00	7.07	0.106	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.40	8.00	0.73	No	N/A	7.07	0.00	7.07	0.103	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.46	8.00	0.71	No	N/A	7.07	0.00	7.07	0.100	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.53	8.00	0.22	No	N/A	7.07	0.00	7.07	0.031	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.60	8.00	0.20	No	N/A	7.07	0.00	7.07	0.028	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.67	8.00	0.18	No	N/A	7.07	0.00	7.07	0.026	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.73	8.00	0.16	No	N/A	7.07	0.00	7.07	0.023	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.80	8.00	0.14	No	N/A	7.07	0.00	7.07	0.020	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.87	8.00	0.12	No	N/A	7.07	0.00	7.07	0.017	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	14.94	8.00	0.10	No	N/A	7.07	0.00	7.07	0.014	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	15.00	8.00	0.08	No	N/A	7.07	0.00	7.07	0.011	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	15.07	8.00	0.06	No	N/A	7.07	0.00	7.07	0.008	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	15.14	8.00	0.03	No	N/A	7.07	0.00	7.07	0.005	Eqn (b)	Ties Not Req'd	
+1.20D+1.60L	2	15.21	8.00	0.01	No	N/A	7.07	0.00	7.07	0.002	Eqn (b)	Ties Not Req'd	

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment	Location (ft) along Beam	Bending Stress Results (k-ft)		
			Mu : Max	Phi*Mnx	Stress Ratio
MAXIMUM BENDING Envelope					
	Span # 1	12.500	8.48	23.12	0.37
	Span # 2	2.750	6.66	26.26	0.25
+1.20D+1.60L					
	Span # 1	12.500	8.48	23.12	0.37
	Span # 2	2.750	6.66	26.26	0.25

Myers Engineering LLC
 Mark Myers, PE
 3206 50th Street CT, Ste. 210-B
 Gig Harbor, WA 98335
 253-858-3248
 myengineer@centurytel.net

Project Title: Schwartz Remodel
 Engineer:
 Project ID:
 Project Descr: Checking Beams for removal of post

Printed: 26 OCT 2025, 1:51PM

Concrete Beam

Project File: Schwartz Beam Checks.ec6

LIC# : KW-06015659, Build:20.25.10.02

MYERS ENGINEERING

(c) ENERCALC, LLC 1982-2025

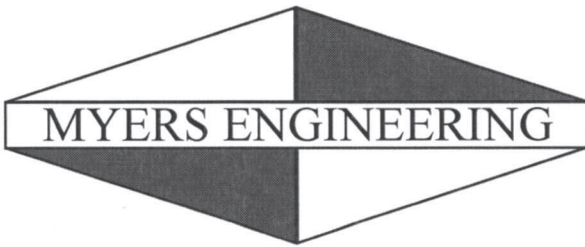
DESCRIPTION: Grade beam for gate posts

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
1	+D+L	0.0110	6.607	+D+L	-0.0001	12.539
2		0.0000	6.607	+D+L	-0.0105	2.750

Maximum Deflections for Load Combinations

Span	Load Combination	Max. Downward Defl	Location in Span	Max. Upward Defl	Location in Span
1	D Only	0.0083	6.250	-0.0001	12.539
2	D Only	0.0000	0.000	-0.0064	2.750
1	+D+L	0.0110	6.607	-0.0001	12.539
2	+D+L	0.0000	0.000	-0.0105	2.750
1	L Only	0.0027	7.321	-0.0000	12.539
2	L Only	0.0000	0.000	-0.0041	2.750



Myers Engineering LLC
3206 50th St Ct NW, Ste 210-B
Gig Harbor, WA 98335
(253) 858-3248
Fax (253) 858-3249
myengineer@centurytel.net

Anchorage calls for 13" embed of anchors \therefore min. depth is 16"
for 3' cover at post anchors

Bolt pattern in 1" dia bolts @ 9" o.c. square, therefore:

$$9'' + 1'' + 2\left(\frac{1}{2}''\right) + 2\left(\frac{3}{8}''\right) + 2(1.5'') = 14.75'' \rightarrow 15'' \text{ width Min.}$$

longit stirrup cover

USE 16" x 16" Grade beam

$$T_u = 1.2(2025 \text{ ft}\cdot\text{lbs}) + 1.6(2700 \text{ ft}\cdot\text{lbs}) = 6750 \text{ ft}\cdot\text{lb} = 81000 \text{ in}\cdot\text{lb}$$

Threshold Torsion:

$$T_{th} = \phi \lambda \sqrt{f'_c} \left(\frac{A_{cp}^2}{P_{cp}} \right) = \frac{1}{4} T_{cr}$$

$$= 0.75(1) \sqrt{2500 \frac{\text{lb}}{\text{in}^2}} \left(\frac{(256 \text{ in})^2}{64 \text{ in}} \right) = 38,400 \text{ in}\cdot\text{lb} = 3200 \text{ ft}\cdot\text{lb} < T_u$$

$$x_o = 11'' \quad y_o = 13'' \quad A_{oh} = 143 \text{ in}^2 \quad p_h = 48 \text{ in}$$

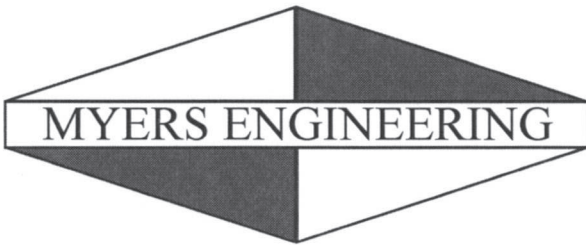
$$T_n = \frac{2A_o(A_e f_{yv})}{s} \cot \theta \quad w/\theta = 45 \quad A_o = 0.85 A_{oh} = 121.55 \text{ in}^2$$

$$T_n = \frac{T_u}{\phi} \rightarrow \text{Req'd } (A_e/s) = \left(\frac{T_u}{\phi} \right) / (2A_o f_{yv})$$

$$\text{Req'd } A_e = (A_e/s) p_h \rightarrow A_e s = A_e p_h$$

FOR RKK
JOB Schwartz Gate

DATE 10-25-25
BY MM



Myers Engineering LLC
 3206 50th St Ct NW, Ste 210-B
 Gig Harbor, WA 98335
 (253) 858-3248
 Fax (253) 858-3249
 myengineer@centurytel.net

$$V_{max} = \sqrt{\left(\frac{V_u}{\phi d}\right)^2 + \left(\frac{T_u \rho_h}{1.7 A_{oh}^2}\right)^2} \leq \phi 10 \sqrt{f'_c}$$

$$V_u = 1310 \text{ lb}$$

$$T_u = 6750 \text{ ft}\cdot\text{lb} = 81000 \text{ in}\cdot\text{lb}$$

$$V_{max} = \sqrt{\left(\frac{1310 \text{ lb}}{16 \times 16 \text{ in}}\right)^2 + \left(\frac{81000 \times 48 \text{ in}}{1.7 (143 \text{ in}^2)^2}\right)^2}$$

$$V_{max} \sqrt{26,19 + 12,509} = 112 \text{ psi} \leq \phi 10 \sqrt{f'_c}$$

$$\phi 10 \sqrt{f'_c} = 7.5 \sqrt{2500} = 375 \text{ psi} \quad \text{OK}$$

A_v not req'd per beam calc

$$\begin{aligned} (A_c/s)_{min} &= 25 b_w / f_{yv} \\ &= 25(16) / 60000 \\ &= 0.0067 \end{aligned}$$

$$\begin{aligned} 5 \leq \rho_h / 8 \leq 12 \text{ in} \\ \leq 48 / 8 = 6 \text{ in} \quad \checkmark \end{aligned}$$

$$\#3 @ 6 \text{ o.c.} = 0.22 \text{ in}^2 / \text{ft}$$

$$\frac{A_c}{s} = \frac{T_u}{\phi} / (2 A_o f_{yv}) = \left(\frac{81000}{0.75}\right) / (2)(121.6 \text{ in}^2)(60000) = 0.0074 \text{ in}^2$$

$$< 0.22 \text{ in}^2$$

OK

FOR RKK
 JOB Schwartz Gate

DATE 10-25-25
 BY MM