CASA INDUSTRIES
4430 E. Miraloma Ave. Suite D Anaheim, California 92807

at&t

CSL04566
AT&T LAND LINE SWITCH
202 W. Ojai Ave.
Ojai, CA 93023

Prepared for
Smartlink

STRUCTURAL CALCULATIONS
Equipment Support

By

NICK ENGINEERING

3842 Hendrix Street
Irvine, CA 92614

REGISTERED PROFESSIONAL ENGINEER
SASAN MOBED MEHDIABADI
NO. 75884
EXP. 06.30.22
CIVIL
STATE OF CALIFORNIA

Sasan Mobed, P.E. 75884

May 19, 2021

Design Criteria

I. Code

California Building Code, 2019 Edition.
ASCE7-16 Minimum Design Loads for Buildings & other structures

II. Scope of Work

1. **Install (1) new DELTA "Walk up cabinet" with the maximum weight of 6000 lbs on new steel platform on roof.**
2. **Install new anchor bolts for proposed screen (screen by others).**

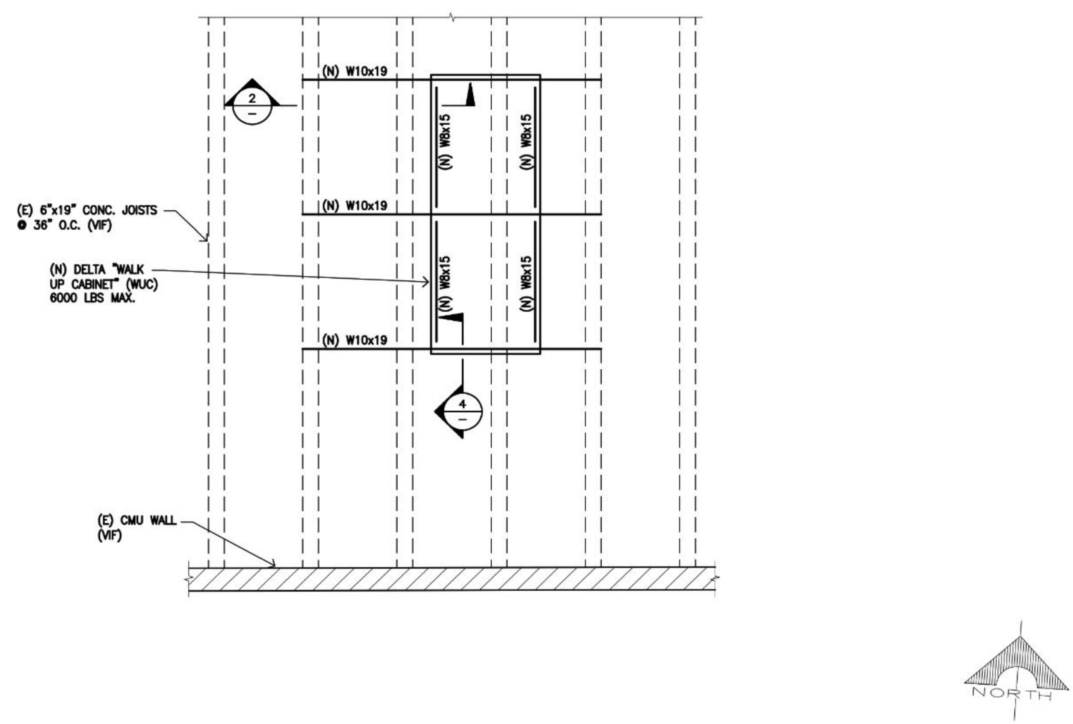
III. Citation

The following documents were provided to Nick Engineering for the purpose of generating this report. It is assumed that this information is accurate and correct. Nick Engineering shall not be responsible for information/calculations prepared by others or for errors in our design as a result of inaccurate information provided to us.

1. **Structural as-built drawings provided by Stanley H Mendes, dated 06/15/73.**

Provisions of Analysis & Disclaimer:
The analysis and conclusions contained in this report are based on information provided by AT&T. Construction not performed in accordance with the provisions contained herein will void this report. Nick Engineering declines any responsibility for damages that originated prior to the proposed modifications/additions or for the accuracy of design/calculations done by others or for variations in the design and field conditions. Discrepancies between field conditions and this report should be immediately brought to the attention of Nick Engineering for review.

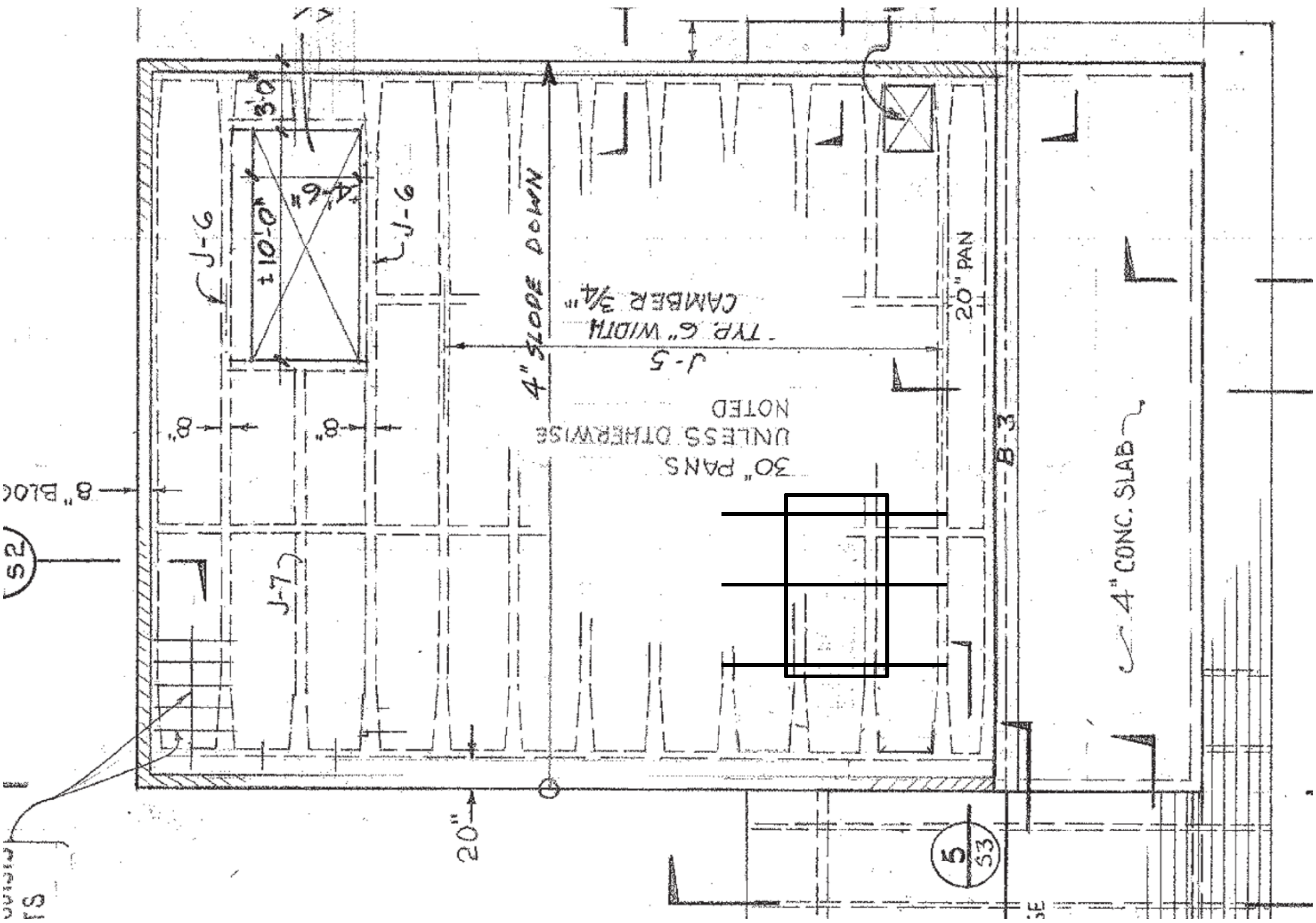
NOTE:
1. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AT THE JOB SITE. ANY DISCREPANCIES SHALL BE RESOLVED WITH ARCH/ENGINEER PRIOR TO START OF CONSTRUCTION.
2. THE GENERAL CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF THE EXISTING CONCRETE JOISTS AND THE EXISTING REINFORCEMENTS PRIOR TO START OF CONSTRUCTION.
3. DO NOT CUT OR DAMAGE ANY (E) REINFORCEMENT WHILE DRILLING FOR NEW ANCHORS.



EQUIPMENT SUPPORT FRAMING PLAN

SCALE: 3/8"=1'-0"

1



EXISTING ROOF FRAMING PLAN (AS-BUILT)

Steel Beam

Lic. # : KW-06013139 Nick Engineering Inc.

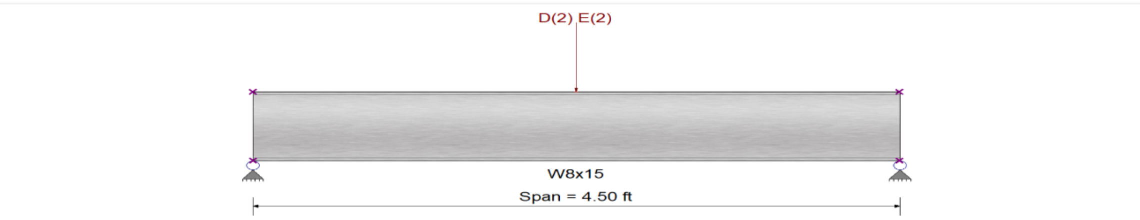
DESCRIPTION: DESIGN OF NEW STEEL BEAM

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	36.0 ksi
Beam Bracing :	Completely Unbraced	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Load(s) for Span Number 1
Point Load : D = 2.0, E = 2.0 k @ 2.250 ft, (WIC)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	**0.157** : 1	Maximum Shear Stress Ratio =	**0.059** : 1
Section used for this span	**W8x15**	Section used for this span	**W8x15**
Ma : Applied	3.825 k-ft	Va : Applied	1.70 k
Mn / Omega : Allowable	24.431 k-ft	Vn/Omega : Allowable	28.612 k
Load Combination	+D+0.70E	Load Combination	+D+0.70E
Location of maximum on span	2.250 ft	Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.005 in	Ratio =	11,407	>=360
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360
Max Downward Total Deflection	0.008 in	Ratio =	6711	>=180
Max Upward Total Deflection	0.000 in	Ratio =	0	<180

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios		Summary of Moment Values							Summary of Shear Values		
Segment Length	Span #	M	V	Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
D Only													
Dsgn. L = 4.50 ft	1	0.092	0.035	2.25		2.25	40.80	24.43	1.32	1.00	1.00	42.92	28.61
+0.60D													
Dsgn. L = 4.50 ft	1	0.055	0.021	1.35		1.35	40.80	24.43	1.32	1.00	0.60	42.92	28.61
+D+0.70E													
Dsgn. L = 4.50 ft	1	0.157	0.059	3.82		3.82	40.80	24.43	1.32	1.00	1.70	42.92	28.61
+D+0.5250E													
Dsgn. L = 4.50 ft	1	0.140	0.053	3.43		3.43	40.80	24.43	1.32	1.00	1.53	42.92	28.61
+0.60D+0.70E													
Dsgn. L = 4.50 ft	1	0.120	0.045	2.92		2.92	40.80	24.43	1.32	1.00	1.30	42.92	28.61

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.70E	1	0.0080	2.250		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.700	1.700
Overall MINimum	0.600	0.600
D Only	1.000	1.000
+0.60D	0.600	0.600
+D+0.70E	1.700	1.700

Steel Beam

File: CALC.ec6
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Lic. # : KW-06013139
Nick Engineering Inc.

DESCRIPTION: DESIGN OF NEW STEEL BEAM

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
+D+0.5250E	1.525	1.525
+0.60D+0.70E	1.300	1.300
E Only	1.000	1.000

Steel Section Properties : W8x15

Depth	=	8.110	in	I xx	=	48.00	in^4	J	=	0.137	in^4
Web Thick	=	0.245	in	S xx		11.80	in^3	Cw	=	51.80	in^6
Flange Width	=	4.015	in	R xx	=	3.290	in				
Flange Thick	=	0.315	in	Zx	=	13.600	in^3				
Area	=	4.440	in^2	I yy	=	3.410	in^4				
Weight	=	15.000	plf	S yy	=	1.700	in^3	Wno	=	7.810	in^2
Kdesign	=	0.615	in	R yy	=	0.876	in	Sw	=	2.470	in^4
K1	=	0.563	in	Zy	=	2.670	in^3	Qf	=	2.310	in^3
rts	=	1.060	in					Qw	=	6.640	in^3
Ycg	=	4.055	in								

Concrete Beam

File: CALC.ec6

Lic. # : KW-06013139 Nick Engineering Inc.

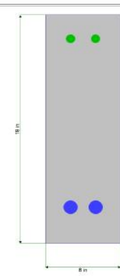
DESCRIPTION: CHECK (E) CONC. ROOF JOISTS (RECTANGULAR)

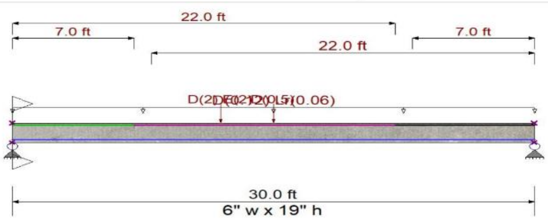
CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

f'c =	3.0 ksi	φ Phi Values Flexure :	0.90
$fr = f'c^{1/2} * 7.50$ =	410.792 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 ksi	E - Stirrups =	29,000.0 ksi
E - Main Rebar =	29,000.0 ksi	Stirrup Bar Size #	3
		Number of Resisting Legs Per Stirrup =	2





Cross Section & Reinforcing Details

Rectangular Section, Width = 6.0 in, Height = 19.0 in
Span #1 Reinforcing....
2-#9 at 3.0 in from Bottom, from 0.0 to 30.0 ft in this span
1-#5 at 2.0 in from Top, from 7.0 to 23.0 ft in this span
2-#6 at 2.0 in from Top, from 0.0 to 8.0 ft in this span
2-#6 at 2.0 in from Top, from 22.0 to 30.0 ft in this span

Beam self weight calculated and added to loads
Load for Span Number 1
Uniform Load : D = 0.040, Lr = 0.020 ksf, Tributary Width = 3.0 ft, (ROOF)
Point Load : D = 2.0, E = 2.0 k @ 12.0 ft, (WIC)
Point Load : D = 0.50 k @ 15.0 ft, ((E) AC)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	**0.568** : 1
Section used for this span	**Typical Section**
Mu : Applied	65.696 k-ft
Mn * Phi : Allowable	115.733 k-ft
Location of maximum on span	12.022 ft
Span # where maximum occurs	Span # 1

Maximum Deflection			
Max Downward Transient Deflection	0.178 in	Ratio =	2021 >=360.
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360.0
Max Downward Total Deflection	1.100 in	Ratio =	327 >=180.
Max Upward Total Deflection	0.000 in	Ratio =	0 <180.0

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Overall MAXimum	5.872	5.472
Overall MINimum	0.900	0.800
+D+H	4.972	4.572
+D+L+H	4.972	4.572
+D+Lr+H	5.872	5.472
+D+S+H	4.972	4.572
+D+0.750Lr+0.750L+H	5.647	5.247
+D+0.750L+0.750S+H	4.972	4.572
+D+0.60W+H	4.972	4.572

Concrete Beam

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DESCRIPTION: CHECK (E) CONC. ROOF JOISTS (RECTANGULAR)

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
+D+0.750Lr+0.750L+0.450W+H	5.647	5.247
+D+0.750L+0.750S+0.450W+H	4.972	4.572
+0.60D+0.60W+0.60H	2.983	2.743
+D+0.70E+0.60H	5.812	5.132
+D+0.750L+0.750S+0.5250E+H	5.602	4.992
+0.60D+0.70E+H	3.823	3.303
D Only	4.972	4.572
Lr Only	0.900	0.900
E Only	1.200	0.800
H Only		

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k) Actual	Vu (k) Design	Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in) Req'd	Spacing (in) Suggest
+1.20D+1.60Lr+0.50W+1.60H	1	0.00	16.00	7.41	7.41	0.00	1.00	11.24	PhiVc/2 < Vu <=	Min 9.6.3.1	24.4	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	0.33	16.00	7.28	7.28	2.41	1.00	11.24	PhiVc/2 < Vu <=	Min 9.6.3.1	24.4	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	0.66	16.00	7.16	7.16	4.78	1.00	11.24	PhiVc/2 < Vu <=	Min 9.6.3.1	24.4	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	0.98	16.00	7.03	7.03	7.10	1.00	11.24	PhiVc/2 < Vu <=	Min 9.6.3.1	24.4	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	1.31	16.00	6.91	6.91	9.39	0.98	11.17	PhiVc/2 < Vu <=	Min 9.6.3.1	24.4	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	1.64	16.00	6.79	6.79	11.63	0.78	10.41	PhiVc/2 < Vu <=	Min 9.6.3.1	23.6	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	1.97	16.00	6.66	6.66	13.84	0.64	9.90	PhiVc/2 < Vu <=	Min 9.6.3.1	23.1	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	2.30	16.00	6.54	6.54	16.00	0.54	9.54	PhiVc/2 < Vu <=	Min 9.6.3.1	22.7	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	2.62	16.00	6.43	6.43	17.83	0.48	9.30	PhiVc/2 < Vu <=	Min 9.6.3.1	22.5	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	2.95	16.00	6.33	6.33	19.92	0.42	9.08	PhiVc/2 < Vu <=	Min 9.6.3.1	22.3	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	3.28	16.00	6.24	6.24	21.98	0.38	8.91	PhiVc/2 < Vu <=	Min 9.6.3.1	22.1	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	3.61	16.00	6.15	6.15	24.01	0.34	8.77	PhiVc/2 < Vu <=	Min 9.6.3.1	22.0	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	3.93	16.00	6.06	6.06	26.01	0.31	8.66	PhiVc/2 < Vu <=	Min 9.6.3.1	21.9	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	4.26	16.00	5.97	5.97	27.99	0.28	8.56	PhiVc/2 < Vu <=	Min 9.6.3.1	21.8	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	4.59	16.00	5.87	5.87	29.93	0.26	8.47	PhiVc/2 < Vu <=	Min 9.6.3.1	21.7	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	4.92	16.00	5.78	5.78	31.84	0.24	8.40	PhiVc/2 < Vu <=	Min 9.6.3.1	21.6	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	5.25	16.00	5.69	5.69	33.72	0.22	8.34	PhiVc/2 < Vu <=	Min 9.6.3.1	21.5	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	5.57	16.00	5.60	5.60	35.57	0.21	8.28	PhiVc/2 < Vu <=	Min 9.6.3.1	21.5	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	5.90	16.00	5.50	5.50	37.39	0.20	8.23	PhiVc/2 < Vu <=	Min 9.6.3.1	21.4	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	6.23	16.00	5.41	5.41	39.18	0.18	8.18	PhiVc/2 < Vu <=	Min 9.6.3.1	21.4	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	6.56	16.00	5.32	5.32	40.93	0.17	8.14	PhiVc/2 < Vu <=	Min 9.6.3.1	21.3	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	6.89	16.00	5.23	5.23	42.66	0.16	8.11	PhiVc/2 < Vu <=	Min 9.6.3.1	21.3	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	7.21	16.00	5.13	5.13	44.36	0.15	8.07	PhiVc/2 < Vu <=	Min 9.6.3.1	21.3	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	7.54	16.00	5.04	5.04	46.03	0.15	8.04	PhiVc/2 < Vu <=	Min 9.6.3.1	21.2	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	7.87	16.00	4.95	4.95	47.67	0.14	8.01	PhiVc/2 < Vu <=	Min 9.6.3.1	21.2	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	8.20	16.00	4.86	4.86	49.27	0.13	7.99	PhiVc/2 < Vu <=	Min 9.6.3.1	21.2	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	8.52	16.00	4.76	4.76	50.85	0.12	7.96	PhiVc/2 < Vu <=	Min 9.6.3.1	21.2	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	8.85	16.00	4.67	4.67	52.40	0.12	7.94	PhiVc/2 < Vu <=	Min 9.6.3.1	21.1	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	9.18	16.00	4.58	4.58	53.92	0.11	7.92	PhiVc/2 < Vu <=	Min 9.6.3.1	21.1	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	9.51	16.00	4.49	4.49	55.40	0.11	7.90	PhiVc/2 < Vu <=	Min 9.6.3.1	21.1	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	9.84	16.00	4.39	4.39	56.86	0.10	7.88	PhiVc/2 < Vu <=	Min 9.6.3.1	21.1	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	10.16	16.00	4.30	4.30	58.28	0.10	7.86	PhiVc/2 < Vu <=	Min 9.6.3.1	21.1	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	10.49	16.00	4.21	4.21	59.68	0.09	7.85	PhiVc/2 < Vu <=	Min 9.6.3.1	21.0	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	10.82	16.00	4.12	4.12	61.04	0.09	7.83	PhiVc/2 < Vu <=	Min 9.6.3.1	21.0	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	11.15	16.00	4.03	4.03	62.38	0.09	7.82	PhiVc/2 < Vu <=	Min 9.6.3.1	21.0	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	11.48	16.00	3.93	3.93	63.68	0.08	7.80	PhiVc/2 < Vu <=	Min 9.6.3.1	21.0	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	11.80	16.00	3.84	3.84	64.96	0.08	7.79	Vu < PhiVc/2	lot Reqd 9.6.	7.8	0.0	0.0
+0.90D+E+0.90H	1	12.13	16.00	-0.69	0.69	52.79	0.02	7.56	Vu < PhiVc/2	lot Reqd 9.6.	7.6	0.0	0.0
+0.90D+E+0.90H	1	12.46	16.00	-0.76	0.76	52.56	0.02	7.56	Vu < PhiVc/2	lot Reqd 9.6.	7.6	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	12.79	16.00	-0.84	0.84	65.14	0.02	7.56	Vu < PhiVc/2	lot Reqd 9.6.	7.6	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	13.11	16.00	-0.93	0.93	64.85	0.02	7.56	Vu < PhiVc/2	lot Reqd 9.6.	7.6	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	13.44	16.00	-1.02	1.02	64.53	0.02	7.57	Vu < PhiVc/2	lot Reqd 9.6.	7.6	0.0	0.0

Concrete Beam

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Lic. # : KW-06013139
Nick Engineering Inc.

DESCRIPTION: CHECK (E) CONC. ROOF JOISTS (RECTANGULAR)

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k) Actual	Vu (k) Design	Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in) Req'd	Spacing (in) Suggest
+1.20D+L+0.20S+E+1.60H	1	13.77	16.00	-1.11	1.11	64.18	0.02	7.58	Vu < PhiVc/2	lot Reqd 9.6.	7.6	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	14.10	16.00	-1.21	1.21	63.80	0.03	7.59	Vu < PhiVc/2	lot Reqd 9.6.	7.6	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	14.43	16.00	-1.30	1.30	63.39	0.03	7.60	Vu < PhiVc/2	lot Reqd 9.6.	7.6	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	14.75	16.00	-1.39	1.39	62.95	0.03	7.60	Vu < PhiVc/2	lot Reqd 9.6.	7.6	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	15.08	16.00	-2.08	2.08	62.43	0.04	7.66	Vu < PhiVc/2	lot Reqd 9.6.	7.7	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	15.41	16.00	-2.18	2.18	61.73	0.05	7.67	Vu < PhiVc/2	lot Reqd 9.6.	7.7	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	15.74	16.00	-2.27	2.27	61.00	0.05	7.68	Vu < PhiVc/2	lot Reqd 9.6.	7.7	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	16.07	16.00	-2.36	2.36	60.24	0.05	7.69	Vu < PhiVc/2	lot Reqd 9.6.	7.7	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	16.39	16.00	-2.45	2.45	59.45	0.06	7.70	Vu < PhiVc/2	lot Reqd 9.6.	7.7	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	16.72	16.00	-2.54	2.54	58.63	0.06	7.71	Vu < PhiVc/2	lot Reqd 9.6.	7.7	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	17.05	16.00	-2.64	2.64	57.78	0.06	7.72	Vu < PhiVc/2	lot Reqd 9.6.	7.7	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	17.38	16.00	-2.73	2.73	56.90	0.06	7.73	Vu < PhiVc/2	lot Reqd 9.6.	7.7	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	17.70	16.00	-2.82	2.82	55.99	0.07	7.74	Vu < PhiVc/2	lot Reqd 9.6.	7.7	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	18.03	16.00	-2.91	2.91	55.05	0.07	7.76	Vu < PhiVc/2	lot Reqd 9.6.	7.8	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	18.36	16.00	-3.01	3.01	54.08	0.07	7.77	Vu < PhiVc/2	lot Reqd 9.6.	7.8	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	18.69	16.00	-3.10	3.10	53.08	0.08	7.78	Vu < PhiVc/2	lot Reqd 9.6.	7.8	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	19.02	16.00	-3.19	3.19	52.05	0.08	7.80	Vu < PhiVc/2	lot Reqd 9.6.	7.8	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	19.34	16.00	-3.28	3.28	50.99	0.09	7.81	Vu < PhiVc/2	lot Reqd 9.6.	7.8	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	19.67	16.00	-3.38	3.38	49.90	0.09	7.83	Vu < PhiVc/2	lot Reqd 9.6.	7.8	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	20.00	16.00	-3.47	3.47	48.77	0.09	7.85	Vu < PhiVc/2	lot Reqd 9.6.	7.8	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	20.33	16.00	-3.56	3.56	47.62	0.10	7.87	Vu < PhiVc/2	lot Reqd 9.6.	7.9	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	20.66	16.00	-3.65	3.65	46.44	0.10	7.89	Vu < PhiVc/2	lot Reqd 9.6.	7.9	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	20.98	16.00	-3.75	3.75	45.23	0.11	7.91	Vu < PhiVc/2	lot Reqd 9.6.	7.9	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	21.31	16.00	-3.84	3.84	43.98	0.12	7.93	Vu < PhiVc/2	lot Reqd 9.6.	7.9	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	21.64	16.00	-3.93	3.93	42.71	0.12	7.95	Vu < PhiVc/2	lot Reqd 9.6.	8.0	0.0	0.0
+1.20D+L+0.20S+E+1.60H	1	21.97	16.00	-4.02	4.02	41.41	0.13	7.98	PhiVc/2 < Vu <=	Min 9.6.3.1	21.2	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	22.30	16.00	-4.12	4.12	40.07	0.14	8.01	PhiVc/2 < Vu <=	Min 9.6.3.1	21.2	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	22.62	16.00	-4.21	4.21	38.71	0.14	8.04	PhiVc/2 < Vu <=	Min 9.6.3.1	21.2	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	22.95	16.00	-4.30	4.30	37.31	0.15	8.07	PhiVc/2 < Vu <=	Min 9.6.3.1	21.3	8.0	8.0
+1.20D+L+0.20S+E+1.60H	1	23.28	16.00	-4.39	4.39	35.89	0.16	8.10	PhiVc/2 < Vu <=	Min 9.6.3.1	21.3	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	23.61	16.00	-4.51	4.51	36.56	0.16	8.11	PhiVc/2 < Vu <=	Min 9.6.3.1	21.3	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	23.93	16.00	-4.63	4.63	35.06	0.18	8.15	PhiVc/2 < Vu <=	Min 9.6.3.1	21.4	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	24.26	16.00	-4.76	4.76	33.52	0.19	8.20	PhiVc/2 < Vu <=	Min 9.6.3.1	21.4	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	24.59	16.00	-4.88	4.88	31.94	0.20	8.26	PhiVc/2 < Vu <=	Min 9.6.3.1	21.5	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	24.92	16.00	-5.01	5.01	30.32	0.22	8.32	PhiVc/2 < Vu <=	Min 9.6.3.1	21.5	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	25.25	16.00	-5.13	5.13	28.66	0.24	8.39	PhiVc/2 < Vu <=	Min 9.6.3.1	21.6	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	25.57	16.00	-5.25	5.25	26.96	0.26	8.47	PhiVc/2 < Vu <=	Min 9.6.3.1	21.7	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	25.90	16.00	-5.38	5.38	25.21	0.28	8.56	PhiVc/2 < Vu <=	Min 9.6.3.1	21.8	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	26.23	16.00	-5.50	5.50	23.43	0.31	8.67	PhiVc/2 < Vu <=	Min 9.6.3.1	21.9	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	26.56	16.00	-5.63	5.63	21.61	0.35	8.79	PhiVc/2 < Vu <=	Min 9.6.3.1	22.0	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	26.89	16.00	-5.75	5.75	19.74	0.39	8.95	PhiVc/2 < Vu <=	Min 9.6.3.1	22.1	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	27.21	16.00	-5.87	5.87	17.84	0.44	9.14	PhiVc/2 < Vu <=	Min 9.6.3.1	22.3	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	27.54	16.00	-6.00	6.00	15.89	0.50	9.38	PhiVc/2 < Vu <=	Min 9.6.3.1	22.6	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	27.87	16.00	-6.12	6.12	13.90	0.59	9.69	PhiVc/2 < Vu <=	Min 9.6.3.1	22.9	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	28.20	16.00	-6.25	6.25	11.88	0.70	10.12	PhiVc/2 < Vu <=	Min 9.6.3.1	23.3	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	28.52	16.00	-6.37	6.37	9.81	0.87	10.74	PhiVc/2 < Vu <=	Min 9.6.3.1	23.9	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	28.85	16.00	-6.49	6.49	7.70	1.00	11.24	PhiVc/2 < Vu <=	Min 9.6.3.1	24.4	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	29.18	16.00	-6.62	6.62	5.55	1.00	11.24	PhiVc/2 < Vu <=	Min 9.6.3.1	24.4	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	29.51	16.00	-6.74	6.74	3.36	1.00	11.24	PhiVc/2 < Vu <=	Min 9.6.3.1	24.4	8.0	8.0
+1.20D+1.60Lr+0.50W+1.60H	1	29.84	16.00	-6.86	6.86	1.13	1.00	11.24	PhiVc/2 < Vu <=	Min 9.6.3.1	24.4	8.0	8.0

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment	Span #	Location (ft) along Beam	Bending Stress Results (k-ft) Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope					

Concrete Beam

File: CALC.ec6
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Lic. # : KW-06013139 Nick Engineering Inc.

DESCRIPTION: CHECK (E) CONC. ROOF JOISTS (RECTANGULAR)

Load Combination		Location (ft)	Bending Stress Results (k-ft)		
Segment	Span #	along Beam	Mu : Max	Phi*Mnx	Stress Ratio
Span # 1	1	30.000	65.70	115.73	0.57
+1.40D+1.60H					
Span # 1	1	30.000	59.93	115.73	0.52
+1.20D+0.50Lr+1.60L+1.60H					
Span # 1	1	30.000	54.67	115.73	0.47
+1.20D+1.60L+0.50S+1.60H					
Span # 1	1	30.000	51.37	115.73	0.44
+1.20D+1.60Lr+L+1.60H					
Span # 1	1	30.000	61.97	115.73	0.54
+1.20D+1.60Lr+0.50W+1.60H					
Span # 1	1	30.000	61.97	115.73	0.54
+1.20D+L+1.60S+1.60H					
Span # 1	1	30.000	51.37	115.73	0.44
+1.20D+1.60S+0.50W+1.60H					
Span # 1	1	30.000	51.37	115.73	0.44
+1.20D+0.50Lr+L+W+1.60H					
Span # 1	1	30.000	54.67	115.73	0.47
+1.20D+L+0.50S+W+1.60H					
Span # 1	1	30.000	51.37	115.73	0.44
+0.90D+W+1.60H					
Span # 1	1	30.000	38.53	115.73	0.33
+1.20D+L+0.20S+E+1.60H					
Span # 1	1	30.000	65.70	115.73	0.57
+0.90D+E+0.90H					
Span # 1	1	30.000	52.87	115.73	0.46

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
+D+0.70E+0.60H	1	1.0997	14.508		0.0000	0.000

OSHPD

202 W Ojai Ave, Ojai, CA 93023, USA

Latitude, Longitude: 34.4477706, -119.2484033

Date	5/19/2021, 11:23:48 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S_S	1.841	MCE_R ground motion. (for 0.2 second period)
S_1	0.7	MCE_R ground motion. (for 1.0s period)
S_{MS}	2.209	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.473	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.806	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.967	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.841	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.06	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.247	Factored deterministic acceleration value. (0.2 second)
S1RT	0.7	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.785	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.788	Factored deterministic acceleration value. (1.0 second)
PGAd	0.928	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.893	Mapped value of the risk coefficient at short periods
C_{R1}	0.892	Mapped value of the risk coefficient at a period of 1 s

CABINET ANCHORAGE

Design Code: California Building Code, 2016 Edition

Designing For Total Lateral Force

W = 6000 #

SITE CLASS "D"

RISK CATEGORY "II"

$$F_p = \frac{0.4\ a_p\ S_{DS}\ I_p}{R_p}\ (1+2\ Z/h\ )\ W_p$$

$$F_p = \frac{0.4 \times 1.0 \times 1.47 \times 1.0}{3.0}\ (1+2)\ W_p$$

$F_p =$ **0.59** W_p ☑ Governs

$S_{DS} = 1.47$

$a_p = 1.0$

$I_p = 1.0$

$R_p = 3.0$

$F_{p\ min.} = 0.3\ S_{DS}\ I_p\ W_p$

$0.3 \times 1.47 \times 1.0\ W_p$

$0.44\ W_p$

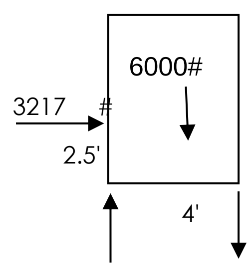
Jse $F_p = \underline{0.7 \times 1.3 \times}\ 0.59\ W_p$

WS

Jse $F_p =$ **0.54** W_p

$V = 0.54 \times W_p$

$V =$ **3217 #**



-2011 2011

3000 3000

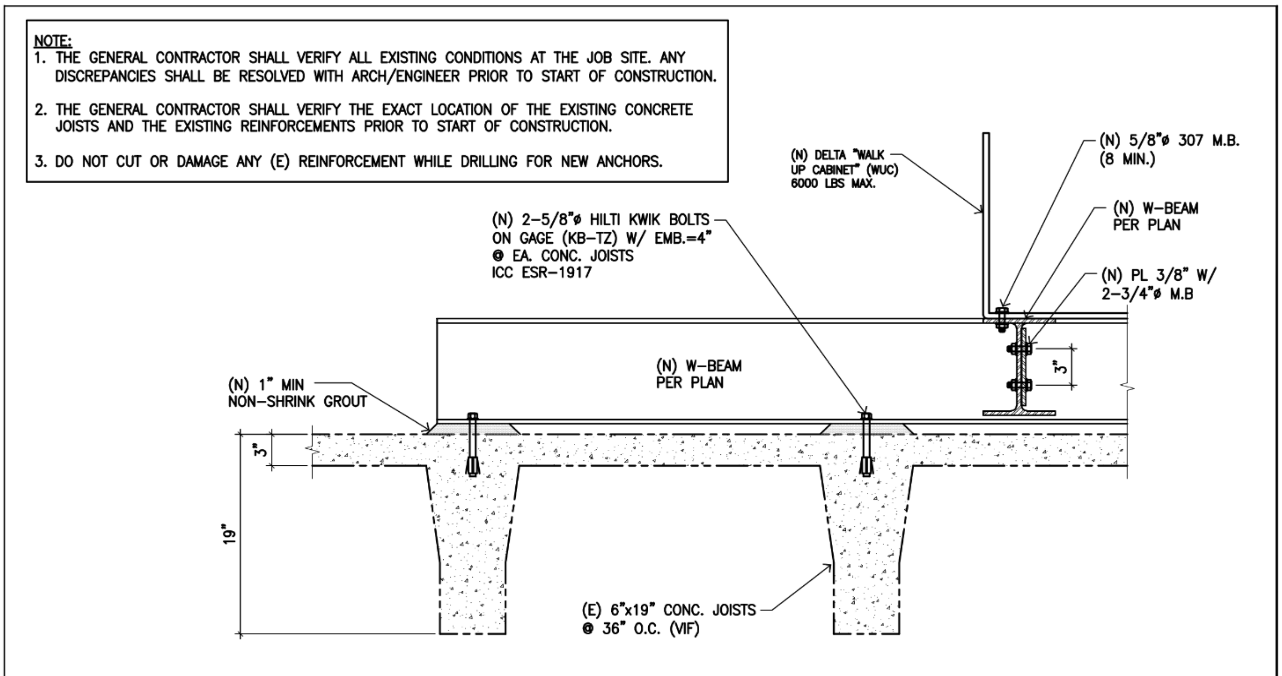
NO UPLIFT

$$V_{one\ bolt} = \frac{3217}{4}$$

$V_{one\ bolt} =$ 804 #

$V_{allow} =$ 3100 #

USE **8-5/8" ø A-307 THRU BOLTS**


NOTE:
1. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AT THE JOB SITE. ANY DISCREPANCIES SHALL BE RESOLVED WITH ARCH/ENGINEER PRIOR TO START OF CONSTRUCTION.
2. THE GENERAL CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF THE EXISTING CONCRETE JOISTS AND THE EXISTING REINFORCEMENTS PRIOR TO START OF CONSTRUCTION.
3. DO NOT CUT OR DAMAGE ANY (E) REINFORCEMENT WHILE DRILLING FOR NEW ANCHORS.
(N) DELTA "WALK UP CABINET" (WUC) 6000 LBS MAX.
(N) 5/8"ø 307 M.B. (8 MIN.)
(N) W-BEAM PER PLAN
(N) PL 3/8" W/ 2-3/4"ø M.B
(N) 2-5/8"ø HILTI KWIK BOLTS ON GAGE (KB-TZ) W/ EMB.=4" @ EA. CONC. JOISTS ICC ESR-1917
(N) W-BEAM PER PLAN
(N) 1" MIN NON-SHRINK GROUT
3"
3"
19"
(E) 6"x19" CONC. JOISTS @ 36" O.C. (VIF)

SECTION **2**

Hilti PROFIS Engineering 3.0.67

www.hilti.com

Company:		Page:	1
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	Concrete - Feb 19, 2021	Date:	2/19/2021
Fastening point:			

Specifier's comments:

1 Input data

Anchor type and diameter:	**Kwik Bolt TZ - CS 5/8 (4)**
Item number:	not available
Effective embedment depth:	$h_{ef,act}$ = 4.000 in., h_{nom} = 4.438 in.
Material:	Carbon Steel
Evaluation Service Report:	ESR-1917
Issued I Valid:	1/1/2020 | 5/1/2021
Proof:	Design Method ACI 318-14 / Mech
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.500 in.
Anchor plate^R :	l_x x l_y x t = 6.000 in. x 12.000 in. x 0.500 in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC), HSS4-1/2X4-1/2X.1875; (L x W x T) = 4.500 in. x 4.500 in. x 0.188 in.
Base material:	cracked concrete, 3000, f_c' = 3,000 psi; h = 19.000 in.
Installation:	**hammer drilled hole, Installation condition: Dry**
Reinforcement:	tension: condition B, shear: condition B; no supplemental splitting reinforcement present
	edge reinforcement: > No. 4 bar

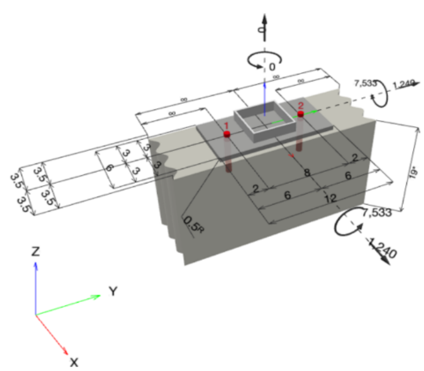
Note: the Kwik Bolt TZ - CS anchor is in the process of phase-out.

Application also possible with Kwik Bolt TZ2 - CS under the selected boundary conditions.

Application also possible with Kwik Bolt TZ2 - CS 5/8 (4) hnom3 under the selected boundary conditions.
More information in section Alternative fastening data of this report.

^{R} - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, in.lb]



Hilti PROFIS Engineering 3.0.67

1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 0; V_x = 1,240; V_y = 1,240; M_x = 7,533; M_y = 7,533; M_z = 0;	no	86

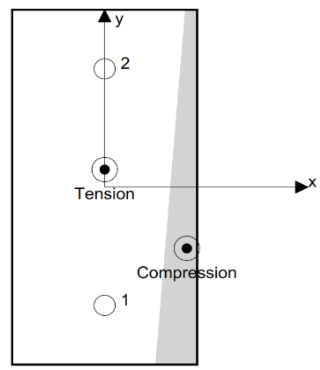
2 Load case/Resulting anchor forces

Anchor reactions [lb]
Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	1,203	877	620	620
2	1,623	877	620	620

max. concrete compressive strain:	0.18 [‰]
max. concrete compressive stress:	798 [psi]
resulting tension force in (x/y)=(0.000/0.594):	2,826 [lb]
resulting compression force in (x/y)=(2.665/-2.072):	2,826 [lb]

Anchor forces are calculated based on the assumption of a rigid anchor plate.



3 Tension load

	Load N_{ua} [lb]	Capacity ϕ N_n [lb]	Utilization $\beta_N = N_{ua}/\phi$ N_n	Status
Steel Strength*	1,623	12,877	13	OK
Pullout Strength*	N/A	N/A	N/A	N/A
Concrete Breakout Failure**	2,826	3,748	76	OK

* highest loaded anchor **anchor group (anchors in tension)

Hilti PROFIS Engineering 3.0.67

www.hilti.com

Company:		Page:	3
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	Concrete - Feb 19, 2021	Date:	2/19/2021
Fastening point:			

3.1 Steel Strength

N_{sa} = ESR value refer to ICC-ES ESR-1917
$\phi\ N_{sa} \geq N_{ua}$ ACI 318-14 Table 17.3.1.1

Variables

$A_{se,N}$ [in.^{2}]	f_{uta} [psi]
0.16	106,000

Calculations

N_{sa} [lb]
17,170

Results

N_{sa} [lb]	ϕ_{steel}	$\phi\ N_{sa}$ [lb]	N_{ua} [lb]
17,170	0.750	12,877	1,623

Hilti PROFIS Engineering 3.0.67

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Company:		Page:	4
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	Concrete - Feb 19, 2021	Date:	2/19/2021
Fastening point:			

3.2 Concrete Breakout Failure

$N_{cbg} = \left(\frac{A_{Nc}}{A_{Nc0}}\right) \psi_{ec,N}\ \psi_{ed,N}\ \psi_{c,N}\ \psi_{cp,N}\ N_b$ — ACI 318-14 Eq. (17.4.2.1b)

$\phi\ N_{cbg} \geq N_{ua}$ — ACI 318-14 Table 17.3.1.1

A_{Nc} see ACI 318-14, Section 17.4.2.1, Fig. R 17.4.2.1(b)

$A_{Nc0} = 9\ h_{ef}^2$ — ACI 318-14 Eq. (17.4.2.1c)

$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2\ e_N}{3\ h_{ef}}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.4.2.4)

$\psi_{ed,N} = 0.7 + 0.3\left(\frac{c_{a,min}}{1.5h_{ef}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.4.2.5b)

$\psi_{cp,N} = \text{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5h_{ef}}{c_{ac}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.4.2.7b)

$N_b = k_c\ \lambda_a\ \sqrt{f'_c}\ h_{ef}^{1.5}$ — ACI 318-14 Eq. (17.4.2.2a)

Variables

h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]	$\psi_{c,N}$
4.000	0.000	0.594	3.500	1.000

c_{ac} [in.]	k_c	λ_a	f'_c [psi]
6.750	17	1.000	3,000

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
140.00	144.00	1.000	0.910	0.875	1.000	7,449

Results

N_{cbg} [lb]	$\phi_{concrete}$	$\phi\ N_{cbg}$ [lb]	N_{ua} [lb]
5,766	0.650	3,748	2,826

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4 Shear load

	Load V_{ua} [lb]	Capacity ϕ V_n [lb]	Utilization $\beta_V = V_{ua}/\phi$ V_n	Status
Steel Strength*	877	5,259	17	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength**	1,754	8,872	20	OK
Concrete edge failure in direction x+**	1,754	4,258	42	OK

* highest loaded anchor **anchor group (relevant anchors)

4.1 Steel Strength

V_{sa} = ESR value refer to ICC-ES ESR-1917
$\phi\ V_{steel} \geq V_{ua}$ ACI 318-14 Table 17.3.1.1

Variables

$A_{se,V}$ [in.^{2}]	f_{uta} [psi]
0.16	106,000

Calculations

V_{sa} [lb]
8,091

Results

V_{sa} [lb]	ϕ_{steel}	$\phi\ V_{sa}$ [lb]	V_{ua} [lb]
8,091	0.650	5,259	877

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4.2 Pryout Strength

$V_{cpg} = k_{cp}\left[\left(\frac{A_{Nc}}{A_{Nc0}}\right)\psi_{ec,N}\ \psi_{ed,N}\ \psi_{c,N}\ \psi_{cp,N}\ N_b\right]$ ACI 318-14 Eq. (17.5.3.1b)

$\phi\ V_{cpg} \geq V_{ua}$ ACI 318-14 Table 17.3.1.1

A_{Nc} see ACI 318-14, Section 17.4.2.1, Fig. R 17.4.2.1(b)

$A_{Nc0} = 9\ h_{ef}^2$ ACI 318-14 Eq. (17.4.2.1c)

$\psi_{ec,N} = \left(\frac{1}{1+\frac{2\ e_N'}{3\ h_{ef}}}\right) \leq 1.0$ ACI 318-14 Eq. (17.4.2.4)

$\psi_{ed,N} = 0.7 + 0.3\left(\frac{c_{a,min}}{1.5h_{ef}}\right) \leq 1.0$ ACI 318-14 Eq. (17.4.2.5b)

$\psi_{cp,N} = \mathrm{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5h_{ef}}{c_{ac}}\right) \leq 1.0$ ACI 318-14 Eq. (17.4.2.7b)

$N_b = k_c\ \lambda_a\ \sqrt{f_c'}\ h_{ef}^{1.5}$ ACI 318-14 Eq. (17.4.2.2a)

Variables

k_{cp}	h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]
2	4.000	0.000	0.000	3.500

$\psi_{c,N}$	c_{ac} [in.]	k_c	λ_a	f_c' [psi]
1.000	6.750	17	1.000	3,000

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
140.00	144.00	1.000	1.000	0.875	1.000	7,449

Results

V_{cpg} [lb]	$\phi_{concrete}$	$\phi\ V_{cpg}$ [lb]	V_{ua} [lb]
12,674	0.700	8,872	1,754

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4.3 Concrete edge failure in direction x+

$V_{cbg} = \left(\frac{A_{Vc}}{A_{Vc0}}\right) \psi_{ec,V}\ \psi_{ed,V}\ \psi_{c,V}\ \psi_{h,V}\ \psi_{parallel,V}\ V_b$ ACI 318-14 Eq. (17.5.2.1b)

$\phi\ V_{cbg} \geq V_{ua}$ ACI 318-14 Table 17.3.1.1

A_{Vc} see ACI 318-14, Section 17.5.2.1, Fig. R 17.5.2.1(b)

$A_{Vc0} = 4.5\ c_{a1}^2$ ACI 318-14 Eq. (17.5.2.1c)

$\psi_{ec,V} = \left(\frac{1}{1 + \frac{2e'_v}{3c_{a1}}}\right) \leq 1.0$ ACI 318-14 Eq. (17.5.2.5)

$\psi_{ed,V} = 0.7 + 0.3\left(\frac{c_{a2}}{1.5c_{a1}}\right) \leq 1.0$ ACI 318-14 Eq. (17.5.2.6b)

$\psi_{h,V} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0$ ACI 318-14 Eq. (17.5.2.8)

$V_b = \left(7 \left(\frac{l_e}{d_a}\right)^{0.2} \sqrt{d_a}\right) \lambda_a \sqrt{f'_c}\ c_{a1}^{1.5}$ ACI 318-14 Eq. (17.5.2.2a)

Variables

c_{a1} [in.]	c_{a2} [in.]	e_{cV} [in.]	$\psi_{c,V}$	h_a [in.]
3.500	-	0.000	1.200	19.000

l_e [in.]	λ_a	d_a [in.]	f'_c [psi]	$\psi_{parallel,V}$
4.000	1.000	0.625	3,000	1.000

Calculations

A_{Vc} [in.^{2}]	A_{Vc0} [in.^{2}]	$\psi_{ec,V}$	$\psi_{ed,V}$	$\psi_{h,V}$	V_b [lb]
97.12	55.12	1.000	1.000	1.000	2,877

Results

V_{cbg} [lb]	$\phi_{concrete}$	$\phi\ V_{cbg}$ [lb]	V_{ua} [lb]
6,083	0.700	4,258	1,754

5 Combined tension and shear loads

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.754	0.412	5/3	86	OK

$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} <= 1$

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6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2018, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- Refer to the manufacturer's product literature for cleaning and installation instructions.
- For additional information about ACI 318 strength design provisions, please go to https://submittals.us.hilti.com/PROFISAnchorDesignGuide/
- Hilti post-installed anchors shall be installed in accordance with the Hilti Manufacturer's Printed Installation Instructions (MPII). Reference ACI 318-14, Section 17.8.1.

Fastening meets the design criteria!

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7 Installation data

Profile: Square HSS (AISC), HSS4-1/2X4-1/2X.1875; (L x W x T) = 4.500 in. x 4.500 in. x 0.188 in.

Hole diameter in the fixture: d_f = 0.687 in.

Plate thickness (input): 0.500 in.

Recommended plate thickness: not calculated

Drilling method: Hammer drilled

Cleaning: Manual cleaning of the drilled hole according to instructions for use is required.

Anchor type and diameter: Kwik Bolt TZ - CS 5/8 (4)

Item number: not available

Installation torque: 720 in.lb

Hole diameter in the base material: 0.625 in.

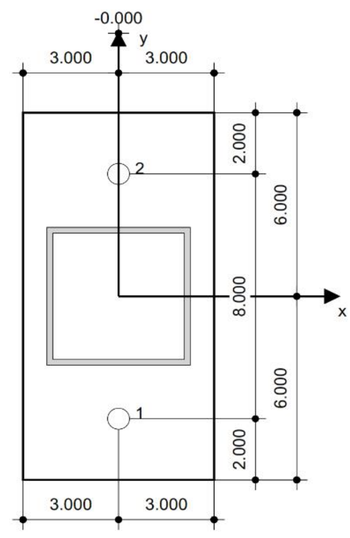
Hole depth in the base material: 4.750 in.

Minimum thickness of the base material: 8.000 in.

Hilti KB-TZ stud anchor with 4.43752 in embedment, 5/8 (4), Carbon steel, installation per ESR-1917

7.1 Recommended accessories

Drilling	Cleaning	Setting
• Suitable Rotary Hammer • Properly sized drill bit	• Manual blow-out pump	• Torque controlled cordless impact tool • Torque wrench • Hammer



Coordinates Anchor [in.]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	0.000	-4.000	3.500	3.500	-	-
2	0.000	4.000	3.500	3.500	-	-

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8 Alternative fastening

8.1 Alternative fastening data

SAFESET

Anchor type and diameter:	**Kwik Bolt TZ2 - CS 5/8 (4) hnom3**
Item number:	2210273 KB-TZ2 5/8x6
Effective embedment depth:	$h_{ef,act}$ = 4.000 in., h_{nom} = 4.500 in.
Material:	Carbon Steel
Evaluation Service Report:	ESR-4266
Issued I Valid:	12/1/2020 | 12/1/2021
Proof:	Design Method ACI 318-14 / Mech
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.500 in.
Anchor plate^R :	l_x x l_y x t = 6.000 in. x 12.000 in. x 0.500 in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC), HSS4-1/2X4-1/2X.1875; (L x W x T) = 4.500 in. x 4.500 in. x 0.188 in.
Base material:	cracked concrete, 3000, f_c' = 3,000 psi; h = 19.000 in.
Installation:	**hammer drilled hole, Installation condition: Dry**
Reinforcement:	tension: condition B, shear: condition B; no supplemental splitting reinforcement present edge reinforcement: > No. 4 bar

Max. Utilization with Kwik Bolt TZ2 - CS 5/8 (4) hnom3: 86 %
Fastening meets the design criteria!

8.2 Installation data

Profile: Square HSS (AISC), HSS4-1/2X4-1/2X.1875; (L x W x T) = 4.500 in. x 4.500 in. x 0.188 in.
Hole diameter in the fixture: d_f = 0.687 in.
Plate thickness (input): 0.500 in.
Recommended plate thickness: not calculated
Drilling method: Hammer drilled
Cleaning: Manual cleaning of the drilled hole according to instructions for use is required.

Anchor type and diameter: Kwik Bolt TZ2 - CS 5/8 (4) hnom3
Item number: 2210273 KB-TZ2 5/8x6
Installation torque: 481 in.lb
Hole diameter in the base material: 0.625 in.
Hole depth in the base material: 4.750 in.
Minimum thickness of the base material: 6.000 in.

Hilti KB-TZ2 stud anchor with 4.5 in embedment, 5/8 (4) hnom3, Carbon steel, installation per ESR-4266

8.2.1 Recommended accessories

Drilling	Cleaning	Setting
• Suitable Rotary Hammer • Properly sized drill bit	• Manual blow-out pump	• Torque controlled cordless impact tool • Torque wrench • Hammer

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9 Remarks; Your Cooperation Duties

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