

Prestige  
**TILT-UP**  
CONSULTING, INC.

*Prestige Tilt-Up Consulting, Inc.*

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# Formwork Design

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**Contractor: C. Overaa & Co.**

**Dealer: White Cap**

**Project: Kaiser Oakland SMOB**

**Location: 3800 W. MacArthur Blvd**

**Job No. (PTCI): 11-160**

**Salesperson: Mike Brikovich**

**NOTE:** The panel contractor must review the project plans and specifications to ensure that the panel dimensions shown in the Prestige Tilt-Up Consulting booklet are correct prior to casting the panels.

**\*Panel Contractor must also refer to manufacturing product's handbook for instructions and information on proper use of products prior to construction of precast concrete Tilt-Up wall panels.**



#### GENERAL

- 1 ARCHITECTURAL AND SITE PLANS FOR THIS PROJECT WERE PREPARED BY OTHERS. ASSUMES NO LIABILITY FOR THE ACCURACY, COMPLETENESS, OR CODE COMPLIANCE OF ARCHITECTURAL, ELECTRICAL, MECHANICAL OR DRAINAGE SPECIFICATIONS. ALL DIMENSIONS SHOULD BE VERIFIED PRIOR TO CONSTRUCTION.
- 2 STRUCTURAL DESIGN IS BASED UPON THE CALIFORNIA BUILDING CODE, 2010 EDITION (2009 IBC) DESIGN LOADS:
- 3 STRUCTURAL REQUIREMENTS SHOWN ON THE FRAMING PLANS AND THESE DETAILS SHALL TAKE PRECEDENCE OVER STRUCTURAL CALLOUTS INDICATED ON ARCHITECTURAL SECTIONS.

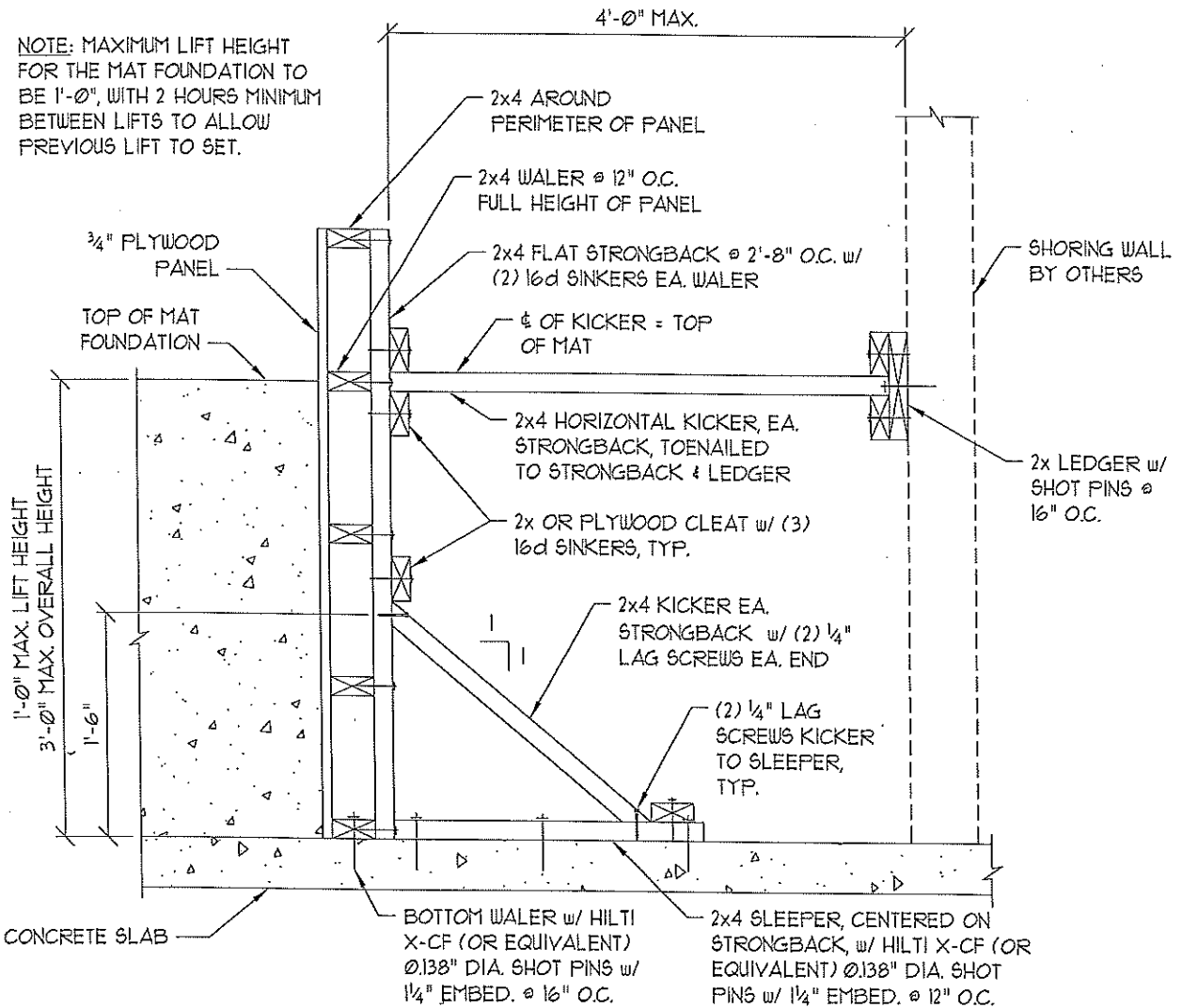
#### CONCRETE

- 1 ALL CONCRETE MIXING, PLACEMENT, FORMING, AND REINFORCING INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", ACI 318, LATEST EDITION.
- 2 CONCRETE SHALL BE AS SPECIFIED IN THE PROJECT SPECIFICATIONS. CONCRETE DENSITY ASSUMED TO BE 150 PCF FOR FORM DESIGN.

#### FRAMING

- 1 WHERE SPECIFIED, DIMENSIONAL SAWN LUMBER SHALL BE AS FOLLOWS:  
DFL STUD GRADE
- 3 WOOD STRUCTURAL PANELS SHALL BE APA RATED PLYWOOD OR O.S.B.

PROJECT OAKLAND MEDICAL CENTER FORMING SHEET        OF         
 SUBJECT DETAIL A - EDGE FORM DETAIL DESIGNED BDV CHECKED RTA



EDGE FORM SECTION VIEW

N.T.S.

A

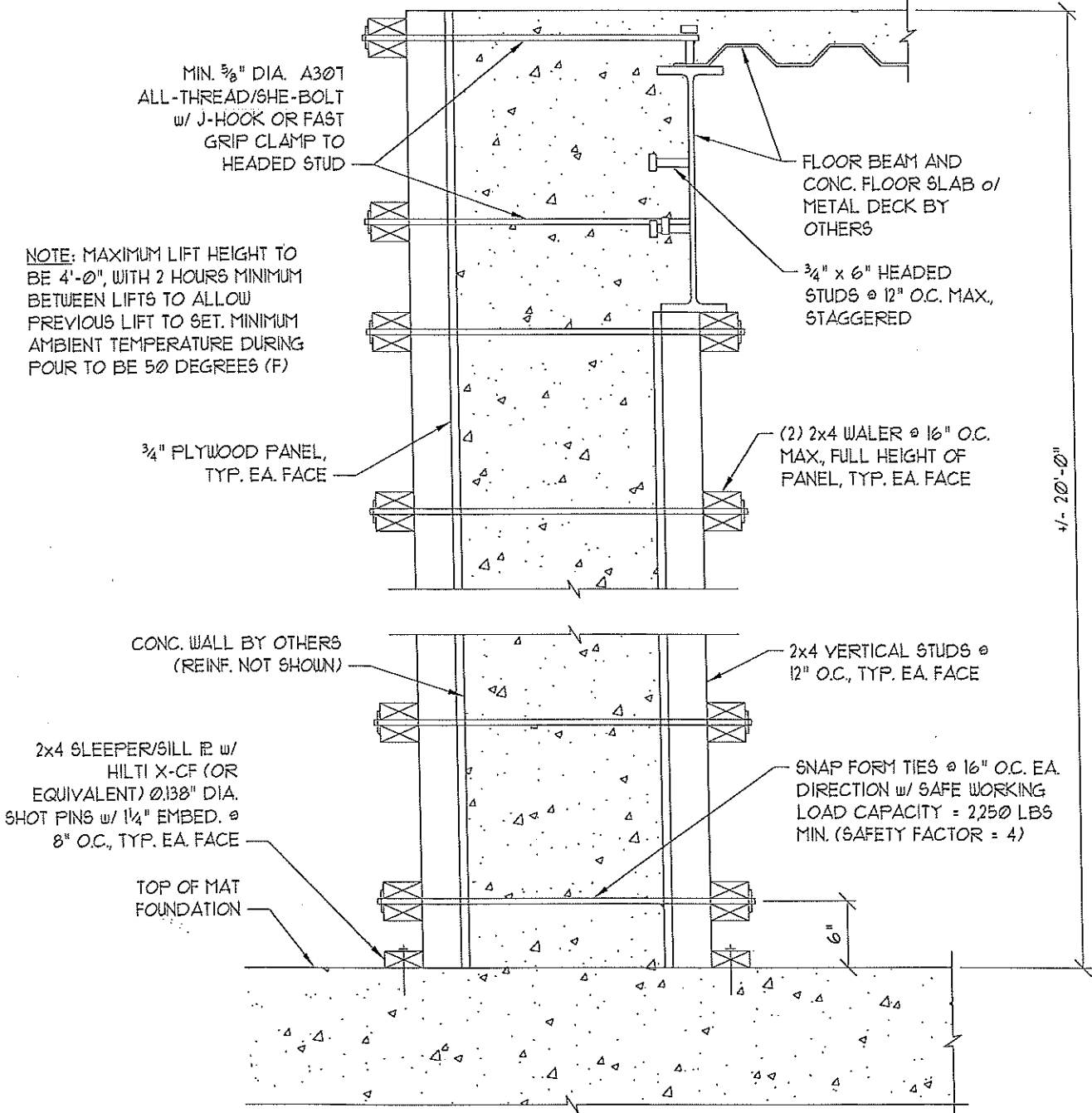
PROJECT OAKLAND MEDICAL CENTER FORMING

SHEET \_\_\_\_\_ OF \_\_\_\_\_

SUBJECT DETAIL B - WALL FORM DETAIL

DESIGNED BDV

CHECKED RTA



NOTE: MAXIMUM LIFT HEIGHT TO BE 4'-0", WITH 2 HOURS MINIMUM BETWEEN LIFTS TO ALLOW PREVIOUS LIFT TO SET. MINIMUM AMBIENT TEMPERATURE DURING POUR TO BE 50 DEGREES (F)

MIN. 3/8" DIA. A307 ALL-THREAD/SHE-BOLT w/ J-HOOK OR FAST GRIP CLAMP TO HEADED STUD

FLOOR BEAM AND CONC. FLOOR SLAB or METAL DECK BY OTHERS

3/4" x 6" HEADED STUDS @ 12" O.C. MAX, STAGGERED

3/4" PLYWOOD PANEL, TYP. EA. FACE

(2) 2x4 WALER @ 16" O.C. MAX, FULL HEIGHT OF PANEL, TYP. EA. FACE

CONC. WALL BY OTHERS (REINF. NOT SHOWN)

2x4 VERTICAL STUDS @ 12" O.C., TYP. EA. FACE

2x4 SLEEPER/SILL w/ HILTI X-CF (OR EQUIVALENT) Ø138" DIA. SHOT PINS w/ 1/4" EMBED. @ 8" O.C., TYP. EA. FACE

SNAP FORM TIES @ 16" O.C. EA. DIRECTION w/ SAFE WORKING LOAD CAPACITY = 2,250 LBS MIN. (SAFETY FACTOR = 4)

TOP OF MAT FOUNDATION

WALL FORM SECTION VIEW

N.T.S.

B



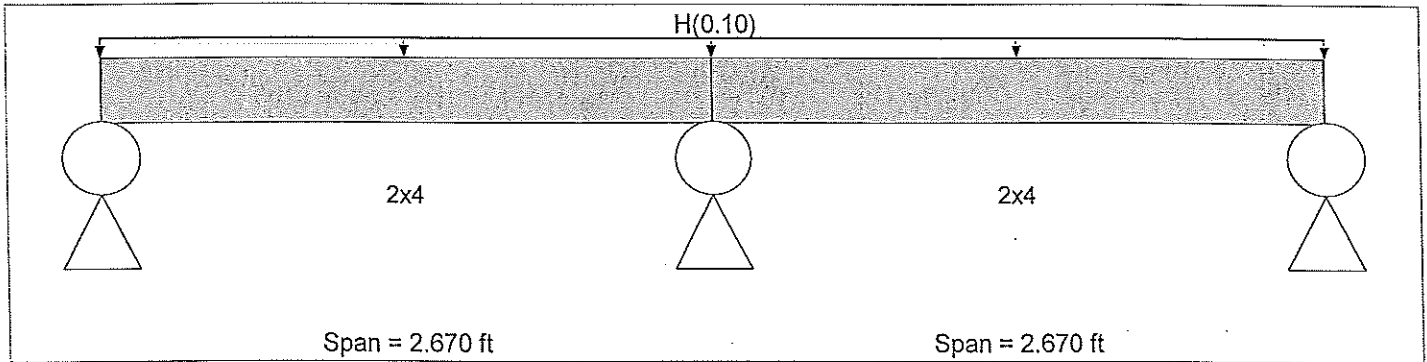
Description : Edge Form - 2x4 Waler

**Material Properties**

Analysis Method : Allowable Stress Design	Fb - Tension	700.0 psi	E : Modulus of Elasticity	
	Fb - Compr	700.0 psi	Ebend - xx	1,400.0ksi
	Fc - Prll	850.0 psi	Eminbend - xx	510.0ksi
Wood Species : Douglas Fir - Larch	Fc - Perp	625.0 psi		
Wood Grade : Stud	Fv	180.0 psi		
	Ft	450.0 psi	Density	32.210pcf
Beam Bracing : Beam bracing is defined Beam-by-Beam			Repetitive Member Stress Increase	

**Unbraced Lengths**

Span # 1, Braced @ Mid Span  
Span # 2, Fully Braced



**Applied Loads**

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

Loads on all spans...

Uniform Load on ALL spans : H = 0.10 k/ft, Tributary Width = 1.0 ft

**DESIGN SUMMARY**

**Design OK**

Maximum Bending Stress Ratio	=	0.316	1	Maximum Shear Stress Ratio	=	0.175	: 1
Section used for this span		2x4		Section used for this span		2x4	
fb : Actual	=	349.17	psi	fv : Actual	=	39.46	psi
FB : Allowable	=	1,104.28	psi	Fv : Allowable	=	225.00	psi
Load Combination		+D+L+H		Load Combination		+D+L+H	
Location of maximum on span	=	2.670	ft	Location of maximum on span	=	2.382	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward L+Lr+S Deflection		0.000	in	Ratio =		0	<360
Max Upward L+Lr+S Deflection		0.000	in	Ratio =		0	<360
Max Downward Total Deflection		0.006	in	Ratio =		4979	
Max Upward Total Deflection		0.000	in	Ratio =		0	<180

**Maximum Forces & Stresses for Load Combinations**

Load Combination	Segment Length	Span #	Max Stress Ratios							Summary of Moment Values			Summary of Shear Values		
			M	V	C <sub>d</sub>	C <sub>FV</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	Mactual	fb-design	Fb-allow	Vactual	fv-design	Fv-allow
<b>+D+L+H</b>															
Length = 1.335 ft	1	0.178	0.091	1.250	1.100	1.150	1.000	1.000	0.05	196.40	1,104.28	0.07	20.39	225.00	
Length = 1.335 ft	1	0.316	0.175	1.250	1.100	1.150	1.000	1.000	-0.09	349.17	1,104.28	0.14	39.46	225.00	
Length = 2.670 ft	2	0.315	0.175	1.250	1.100	1.150	1.000	1.000	-0.09	349.17	1,106.88	0.14	39.46	225.00	

**Overall Maximum Deflections - Unfactored Loads**

Load Combination	Span	Max. "+" Defl	Location in Span	Load Combination	Max. "-" Defl	Location in Span
H Only	1	0.0064	1.130		0.0000	0.000
H Only	2	0.0063	1.561		0.0000	0.000



Description : Edge Form - Strongback (2x4 Flat)

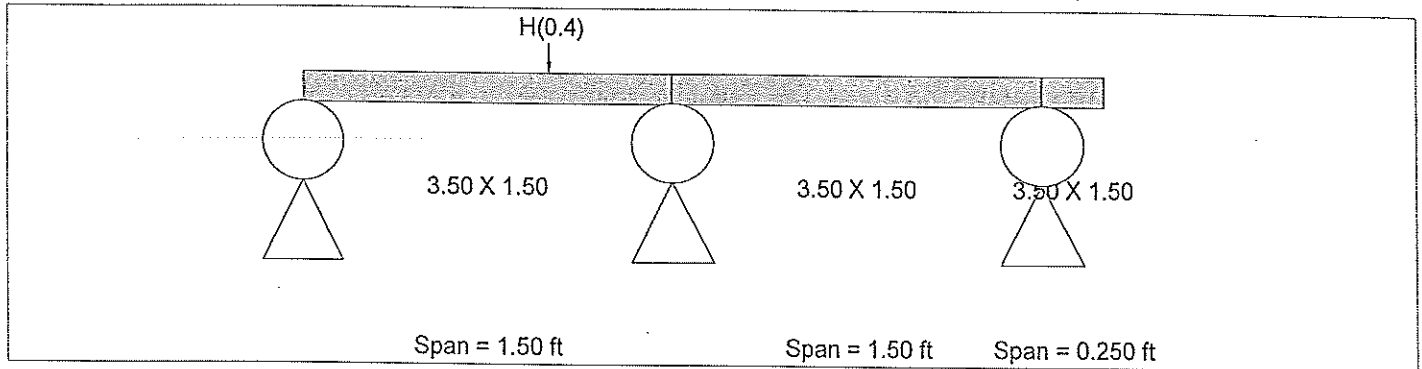
**Material Properties**

Analysis Method : Allowable Stress Design

Wood Species : Douglas Fir - Larch  
Wood Grade : Stud

Beam Bracing : Completely Unbraced

Fb - Tension	700.0 psi	E : Modulus of Elasticity	
Fb - Compr	700.0 psi	Ebend - xx	1,400.0ksi
Fc - Prll	850.0 psi	Eminbend - xx	510.0ksi
Fc - Perp	625.0 psi		
Fv	180.0 psi		
Ft	450.0 psi	Density	32.210pcf



**Applied Loads**

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

Load for Span Number 1

Point Load : H = 0.40 k @ 1.0 ft

**DESIGN SUMMARY**

**Design OK**

Maximum Bending Stress Ratio	=	0.903	1	Maximum Shear Stress Ratio	=	0.386	: 1
Section used for this span		3.50 X 1.50		Section used for this span		3.50 X 1.50	
fb : Actual	=	869.28	psi	fv : Actual	=	86.77	psi
FB : Allowable	=	962.50	psi	Fv : Allowable	=	225.00	psi
Load Combination		+D+L+H		Load Combination		+D+L+H	
Location of maximum on span	=	0.987	ft	Location of maximum on span	=	1.006	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward L+Lr+S Deflection		0.000	in	Ratio =		0	<360
Max Upward L+Lr+S Deflection		0.000	in	Ratio =		0	<360
Max Downward Total Deflection		0.021	in	Ratio =		868	
Max Upward Total Deflection		-0.010	in	Ratio =		1732	

**Maximum Forces & Stresses for Load Combinations**

Load Combination	Segment Length	Span #	Max Stress Ratios							Summary of Moment Values			Summary of Shear Values		
			M	V	C <sub>d</sub>	C <sub>F/V</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	Mactual	fb-design	Fb-allow	Vactual	fv-design	Fv-allow
+D+L+H															
	Length = 1.50 ft	1	0.903	0.386	1.250	1.100	1.000	1.000	1.000	0.10	869.28	962.50	0.30	86.77	225.00
	Length = 1.50 ft	2	0.528	0.386	1.250	1.100	1.000	1.000	1.000	-0.06	507.94	962.50	0.04	86.77	225.00
	Length = 0.250 ft	3		0.386	1.250	1.100	1.000	1.000	1.000			962.50	-0.00	86.77	225.00

**Overall Maximum Deflections - Unfactored Loads**

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
H Only	1	0.0207	0.797		0.0000	0.000
	2	0.0000	0.797	H Only	-0.0104	0.646
	3	0.0044	0.250		0.0000	0.646

**Vertical Reactions - Unfactored**

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3	Support 4
Overall MAXIMUM	0.096	0.341	-0.037	
H Only	0.096	0.341	-0.037	



Description : Edge Form Kicker

**General Information**

Analysis Method :	Allowable Stress Design	Wood Section Name	2x4
End Fixities	Top & Bottom Pinned	Wood Grading/Manuf.	Graded Lumber
Overall Column Height	4.0 ft	Wood Member Type	Sawn
<i>( Used for non-slender calculations )</i>		Exact Width	1.50 in
Wood Species	Douglas Fir - Larch	Exact Depth	3.50 in
Wood Grade	Stud	Area	5.250 in <sup>2</sup>
Fb - Tension	700.0 psi	Ix	5.359 in <sup>4</sup>
Fb - Compr	700.0 psi	Iy	0.9844 in <sup>4</sup>
Fc - Prll	850.0 psi	Allowable Stress Modification Factors	
Fc - Perp	625.0 psi	Cf or Cv for Bending 1.10	
E : Modulus of Elasticity		Cf or Cv for Compression 1.050	
		Cf or Cv for Tension 1.10	
		Cm : Wet Use Factor 1.0	
		Ct : Temperature Factor 1.0	
		Cfu : Flat Use Factor 1.0	
		Kf : Built-up columns 1.0 <i>NDS 15.3.2</i>	
		Use Cr : Repetitive ? No <i>(non-glb only)</i>	
		Brace condition for deflection (buckling) along columns :	
		X-X (width) axis : Unbraced Length for X-X Axis buckling = 4 ft, K = 1.0	
		Y-Y (depth) axis : Unbraced Length for Y-Y Axis buckling = 4 ft, K = 1.0	

**Applied Loads**

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

Column self weight included : 4.697 lbs \* Dead Load Factor

AXIAL LOADS . . .

Strongback Reaction: Axial Load at 4.0 ft, H = 0.50 k

**DESIGN SUMMARY**

**Bending & Shear Check Results**

PASS	Max. Axial+Bending Stress Ratio =	0.2577 : 1	Maximum SERVICE Lateral Load Reactions . .	
	Load Combination	+D+L+H	Top along Y-Y	0.0 k
	Governing NDS Formula	Comp Only, fc/Fc'	Bottom along Y-Y	0.0 k
	Location of max.above base	0.0 ft	Top along X-X	0.0 k
	At maximum location values are . . .		Bottom along X-X	0.0 k
	Applied Axial	0.5047 k	Maximum SERVICE Load Lateral Deflections . . .	
	Applied Mx	0.0 k-ft	Along Y-Y	0.0 in at 0.0 ft above base
	Applied My	0.0 k-ft	for load combination : n/a	
	Fc : Allowable	373.06 psi	Along X-X	0.0 in at 0.0 ft above base
			for load combination : n/a	
PASS	Maximum Shear Stress Ratio =	0.0 : 1	Other Factors used to calculate allowable stresses . . .	
	Load Combination	+D+L+H	Bending	1.100
	Location of max.above base	4.0 ft	Compression	1.050
	Applied Design Shear	0.0 psi	Tension	
	Allowable Shear	225.0 psi	Cf or Cv : Size based factors	

**Load Combination Results**

Load Combination	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio	Status	Location
+D+L+H	0.2577	PASS	0.0 ft	0.0	PASS	4.0 ft

**Maximum Reactions - Unfactored**

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		Y-Y Axis Reaction		Axial Reaction
	@ Base	@ Top	@ Base	@ Top	@ Base
H Only					0.500 k

**Maximum Deflections for Load Combinations - Unfactored Loads**

Load Combination	Max. X-X Deflection		Max. Y-Y Deflection	
	Distance	Distance	Distance	Distance
H Only	0.000 in	0.000 ft	0.000 in	0.000 ft



Description : Wall Form Water - (2) 2x4 Spanning Between Form Ties

**Material Properties**

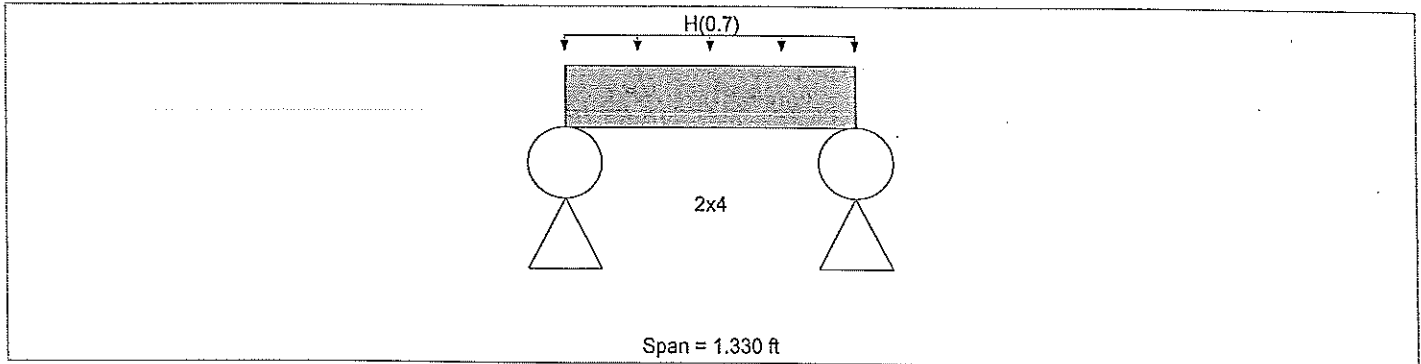
Analysis Method : Allowable Stress Design

Wood Species : Douglas Fir - Larch  
Wood Grade : Stud

Beam Bracing : Completely Unbraced

Fb - Tension 700.0 psi  
Fb - Compr 700.0 psi  
Fc - Prll 850.0 psi  
Fc - Perp 625.0 psi  
Fv 180.0 psi  
Ft 450.0 psi

E : Modulus of Elasticity  
Ebend-xx 1,400.0 ksi  
Eminbend-xx 510.0 ksi  
Density 32.210 pcf



**Applied Loads**

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

Uniform Load : H = 0.70 , Tributary Width = 1.0 ft, (Concrete Pressure)

**DESIGN SUMMARY**

**Design OK**

Maximum Bending Stress Ratio =	0.631 : 1	Maximum Shear Stress Ratio =	0.337 : 1
Section used for this span	2x4	Section used for this span	2x4
fb : Actual =	606.48psi	fv : Actual =	75.81 psi
FB : Allowable =	960.56psi	Fv : Allowable =	225.00 psi
Load Combination	+D+L+H	Load Combination	+D+L+H
Location of maximum on span =	0.665ft	Location of maximum on span =	1.044 ft
Span # where maximum occurs =	Span # 1	Span # where maximum occurs =	Span # 1
<b>Maximum Deflection</b>			
Max Downward L+Lr+S Deflection	0.000 in	Ratio =	0 < 360
Max Upward L+Lr+S Deflection	0.000 in	Ratio =	0 < 360
Max Downward Total Deflection	0.007 in	Ratio =	2410
Max Upward Total Deflection	0.000 in	Ratio =	0 < 180

**Maximum Forces & Stresses for Load Combinations**

Load Combination	Segment Length	Span #	Max Stress Ratios							Summary of Moment Values			Summary of Shear Values		
			M	V	C <sub>d</sub>	C <sub>F/V</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	Mactual	fb-design	Fb-allow	Vactual	fv-design	Fv-allow
+D+L+H	Length = 1.330 ft	1	0.631	0.337	1.250	1.100	1.000	1.000	1.000	0.15	606.48	960.56	0.27	75.81	225.00

**Overall Maximum Deflections - Unfactored Loads**

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
H Only	1	0.0066	0.672		0.0000	0.000

**Vertical Reactions - Unfactored**

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.466	0.466
H Only	0.466	0.466





Description : Wall Form Vertical Stud

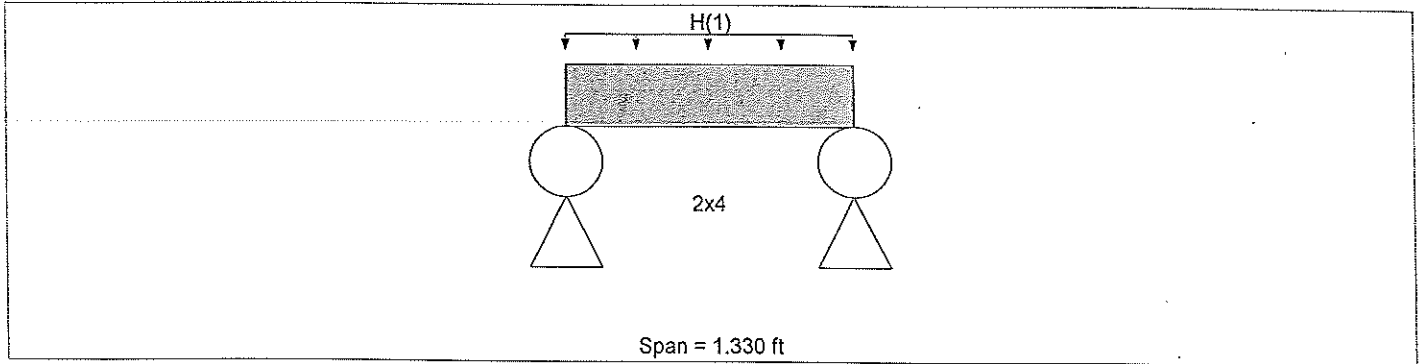
**Material Properties**

Analysis Method : Allowable Stress Design

Wood Species : Douglas Fir - Larch  
Wood Grade : Stud

Beam Bracing : Completely Unbraced

Fb - Tension	700.0 psi	E : Modulus of Elasticity	
Fb - Compr	700.0 psi	Ebend-xx	1,400.0 ksi
Fc - Prll	850.0 psi	Eminbend-xx	510.0 ksi
Fc - Perp	625.0 psi		
Fv	180.0 psi		
Ft	450.0 psi	Density	32.210 pcf



**Applied Loads**

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

Uniform Load : H = 1.0 , Tributary Width = 1.0 ft, (Concrete Pressure)

**DESIGN SUMMARY**

**Design OK**

<p>Maximum Bending Stress Ratio = 0.902 1</p> <p>Section used for this span = 2x4</p> <p>fb : Actual = 866.40 psi</p> <p>FB : Allowable = 960.56 psi</p> <p>Load Combination = +D+L+H</p> <p>Location of maximum on span = 0.665ft</p> <p>Span # where maximum occurs = Span # 1</p> <p>Maximum Deflection</p> <p>Max Downward L+Lr+S Deflection = 0.000 in Ratio = 0 &lt; 360</p> <p>Max Upward L+Lr+S Deflection = 0.000 in Ratio = 0 &lt; 360</p> <p>Max Downward Total Deflection = 0.009 in Ratio = 1687</p> <p>Max Upward Total Deflection = 0.000 in Ratio = 0 &lt; 180</p>	<p>Maximum Shear Stress Ratio = 0.481 : 1</p> <p>Section used for this span = 2x4</p> <p>fv : Actual = 108.30 psi</p> <p>Fv : Allowable = 225.00 psi</p> <p>Load Combination = +D+L+H</p> <p>Location of maximum on span = 1.044 ft</p> <p>Span # where maximum occurs = Span # 1</p>
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**Maximum Forces & Stresses for Load Combinations**

Load Combination	Segment Length	Span #	Max Stress Ratios							Summary of Moment Values			Summary of Shear Values		
			M	V	C <sub>d</sub>	C <sub>FV</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	Mactual	fb-design	Fb-allow	Vactual	fv-design	Fv-allow
+D+L+H	Length = 1.330 ft	1	0.902	0.481	1.250	1.100	1.000	1.000	1.000	0.22	866.40	960.56	0.38	108.30	225.00

**Overall Maximum Deflections - Unfactored Loads**

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
H Only	1	0.0095	0.672		0.0000	0.000

**Vertical Reactions - Unfactored**

Load Combination	Support 1	Support 2
Overall MAXimum	0.665	0.665
H Only	0.665	0.665

Support notation : Far left is #1  
Values in KIPS