Matthew Hood, PE 11500 Benthaven Dr Lakewood, CO 80215	Project Lesher Schmidt Deck	Job No.	
	Subject	Sheet no./rev. 1	
		Calc By MOH	Date 10/13/13

To whom it may concern,

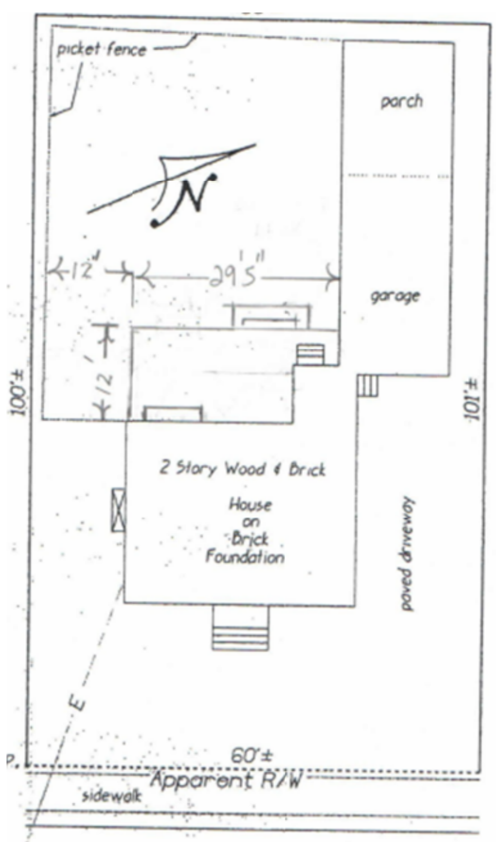
I have reviewed the design of the double 2x8 beam supporting the deck. Based on the following assumptions it is adequate as is.

- Dead load is 10 psf
- Maximum snow load on the deck is 50 psf
- The beam is a double 2x8 of yellow pine no. 2
- The maximum clear span is 7'-1"
- The lumber is pressure treated but not incised

See the calculations below for complete justification of this analysis

Sincerely,

Mathew O. Hood, PE



Dead Load;	DL = 10 psf
Snow Load;	SL = 50 psf
Tributary Width;	Trib = 12 ft /2 = **6.0** ft
Span;	l = 7 ft + 1 in
Load on Beam;	ω = Trib * (DL +SL) = **360** plf
Moment;	M = $\omega * l^2/8$ = **2257.81** lb_ft
Shear;	V = $\omega * l/2$ = **1275** lbs

Matthew Hood, PE 11500 Benthaven Dr Lakewood, CO 80215	Project Lesher Schmidt Deck		Job No.
	Subject		Sheet no./rev. 2
		Calc By MOH	Date 10/13/13

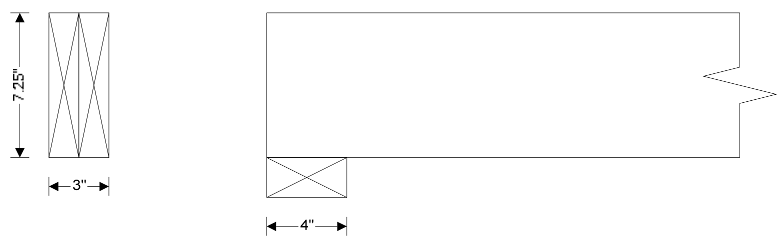
STRUCTURAL WOOD MEMBER DESIGNSTRUCTURAL WOOD BEAM DESIGN (NDS 2005)

In accordance with the ASD method

TEDDS calculation version 1.5.09

Analysis results

Design moment in major axis	M_x = **2257** lb_ft
Design shear	F = **1488** lb
Maximum reaction	R = **1488** lb



Sawn lumber section details

Nominal breadth of sections	b_{nom} = **2** in
Dressed breadth of sections	b = **1.5** in
Nominal depth of sections	d_{nom} = **8** in
Dressed depth of sections	d = **7.25** in
Number of sections in member	N = **2**
Overall breadth of member	$b_b = N \times b$ = **3** in

Table 4B - Reference design values for visually graded Southern Pine dimension lumber (2"-4" thick)

Species, grade and size classification	Southern Pine, No.2 grade, 8" wide
Bending parallel to grain	F_b = **925** lb/in^2
Tension parallel to grain	F_t = **550** lb/in^2
Compression parallel to grain	F_c = **1350** lb/in^2
Compression perpendicular to grain	F_{c_perp} = **565** lb/in^2
Shear parallel to grain	F_v = **175** lb/in^2
Modulus of elasticity	E = **1400000** lb/in^2
Mean shear modulus	G_{def} = E / 16 = **87500** lb/in^2

Member details

Service condition	**Dry**
Length of bearing	L_b = **4** in
Load duration	**Two months**

Section properties

Cross sectional area of member	$A = N \times b \times d$ = **21.75** in^2
Section modulus	$S_x = N \times b \times d^2 / 6$ = **26.28** in^3
	$S_y = d \times (N \times b)^2 / 6$ = **10.87** in^3
Second moment of area	$I_x = N \times b \times d^3 / 12$ = **95.27** in^4
	$I_y = d \times (N \times b)^3 / 12$ = **16.31** in^4

Adjustment factors

Load duration factor - Table 2.3.2 C_D = **1.15**

Temperature factor - Table 2.3.3 C_t = **1.00**

Size factor for bending - Table 4B C_{Fb} = **1.00**

Size factor for tension - Table 4B C_{Ft} = **1.00**

Size factor for compression - Table 4B C_{Fc} = **1.00**

Flat use factor - Table 4B C_{fu} = **1.15**

Incising factor for modulus of elasticity - Table 4.3.8 C_{iE} = **1.00**

Incising factor for bending, shear, tension & compression - Table 4.3.8

C_i = **1.00**

Incising factor for perpendicular compression - Table 4.3.8

C_{ic_perp} = **1.00**

Repetitive member factor - cl.4.3.9 C_r = **1.00**

Bearing area factor - cl.3.10.4 C_b = **1.00**

Depth-to-breadth ratio $d_{nom} / (N \times b_{nom})$ = **2.00**

- Beam is fully restrained

Beam stability factor - cl.3.3.3 C_L = **1.00**

Bearing perpendicular to grain - cl.3.10.2

Design compression perpendicular to grain $F_{c\_perp}' = F_{c\_perp} \times C_t \times C_i \times C_b$ = **565** lb/in^2

Applied compression stress perpendicular to grain $f_{c\_perp} = R / (N \times b \times L_b)$ = **124** lb/in^2

f_{c_perp} / F_{c_perp}' = **0.219**

PASS - Design compressive stress exceeds applied compressive stress at bearing

Strength in bending - cl.3.3.1

Design bending stress $F_b' = F_b \times C_D \times C_t \times C_L \times C_{Fb} \times C_i \times C_r$ = **1064** lb/in^2

Actual bending stress $f_b = M_x / S_x$ = **1031** lb/in^2

f_b / F_b' = **0.969**

PASS - Design bending stress exceeds actual bending stress

Strength in shear parallel to grain - cl.3.4.1

Design shear stress $F_v' = F_v \times C_D \times C_t \times C_i$ = **201** lb/in^2

Actual shear stress - eq.3.4-2 $f_v = 3 \times F / (2 \times A)$ = **103** lb/in^2

f_v / F_v' = **0.510**

PASS - Design shear stress exceeds actual shear stress